THE

NAUTICAL MAGAZINE.

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AND

Naval Chronicle

FOR 1858.

A JOURNAL OF PAPERS

ON SUBJECTS CONNECTED WITH

MARITIME AFFAIRS.

London:
SIMPKIN, MARSHALL AND CO., STATIONER'S HALL COURT;
AND
J. D. POTTER, 31, POULTRY, AND 11, KING STREET,
TOWER HILL.

LONDON:

WALTER SPIERS, PRINTER, GREAT PRESCOT STREET.

CONTENTS OF VOLUME FOR 1858.

ENLARGED SERIES.

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Naval Chronicle.

JANUARY, 1858.

A Lighthouse Tour of Lake Superior.—*By Captain Mackinnon, R.N.*

Uncle Sam is very particular! Uncle Sam is very jealous about his shipping paying more light dues than are justified by circumstances! and, as Uncle Sam provides all the necessary means for defraying the expence of lighting his coasts, why perhaps Uncle Sam is right! It appears that Uncle Sam, at the beginning of the year A.D. 1857 was not quite satisfied with the working of his lighthouses on Lake Superior, and therefore determined to reorganize the whole system. To do this effectually, he appointed two officers from the United States service.

The first of them was Capt. G. H. Scott, of the U.S.N., who was directed to inspect the lighthouses; and the second was First-Lieut. W. F. Smith, of the Topographical Engineers, who was directed to superintend construction, and all mechanical works connected with that department. This officer being armed with full powers to superintend the prodigious extent of lake coast and tributaries, extending from the city of Detroit through Lakes Huron, Michigan, Winnebago, and Superior, found the distance so enormous (being upwards of 4,000 miles) that he considered it necessary to charter a commodious steam vessel to enable him to master his work in the required time. The good steady going vessel *Michigan* was therefore taken for this purpose. She was something under 700 tons burthen, with an average speed of ten knots. Having selected the necessary staff of surveyors, artificers, and lampists, and being ready for the service of

Lake Superior, the author of these lines was honoured with an invitation to join in this interesting trip. His narrative, therefore, will commence on Lake Winnebago, where he received notice to join the *Michigan* at Mackinac.

In the service to which the author belongs an officer always feels proud on seeing that his best endeavours were always relied on to be strictly and zealously carried out in any position in which they were directed. And it is but justice to assert that in the whole course of his experience, a greater amount of zeal and attention, a greater regard for the interest of their departments, as well as of their country, was never displayed than that which animated these able, persevering, and most energetic officers, Capt. Scott and Lieut. Smith, in this their arduous and harassing duty around the shore of Lake Superior. It may appear presumptuous in a British officer to make such an assertion, but in recording his observations the liberty will perhaps be permitted of paying this tribute to the character of those officers.

The people of the United States have in this district a young country before them, and some of course are busy in the process of city making, which is not the simple and easy operation generally believed. No place, however well selected, can become immediately a flourishing town, a centre of business. Several requisites are absolutely necessary to effect this object, and the utmost care must be taken, if a sound healthy growth is looked for, to discourage the fever of such speculation as now burns furiously through some towns on Lake Superior.

The first requisite is a good natural point of land, a point not likely to be damaged or overwhelmed by the progress of the surrounding country. The second is a facility for emigration: either by lake, river, or road. The third is an influx of an industrious, settling population; not pre-emptors who speculate. The fourth is political influence to attract the public improvements; and, lastly, considerable capital, which may be locked up for years without interest. Such are the materials required for city making.

If these requisites are attended to, success will follow, and such success that the wildest imagination can hardly anticipate or realize. A person having adopted such measures in reference to the island at the outlet of Lake Winnebago, may confidently leave it to the judgment of the whole United States to say whether he is not justified in saying this with reference to Lake Superior.

One evening we were quietly enjoying a mild specimen of the leaf in front of an old log house absolutely enveloped in vines and creepers. The sun had just disappeared, and the moon was rising over the low point of land that forms the southern outlet of Lake Winnebago. The river formed by this point was rapidly hastening towards the water power at the rate of five miles an hour, producing an inclined plane of glittering crystal, glancing in the moonlight ray. The Italian sky still retained the gorgeous colouring of the departed sun; whilst the murmurs of the rippling water, as it curved around the point, was softly contrasted with the rustling of the woodcocks' wings as they

sought their undisturbed home in the natural copses of plum trees or wild vines, sacred as yet from the invasion of the sportsman.

Lost in admiration of this delicious scene, it was not until the exclamation was repeated from the bowery log house, "Here is the post. Letters for you, Captain," that the reality became evident. The expected summons to join the *Michigan* had arrived; and it was necessary to take immediate steps to depart for Mackinac. The following morning having proceeded to the State canal at Menasha, and awaited the arrival of the first steamboat bound up Lake Winnebago to Fond-du-Lac, the author started the next morning from thence on the newly opened railway for Milwaukee, in high spirits, as the train moved at respectable speed through the glorious prairies, recently gained from a wild desert, but now teeming with an active and intelligent population.

Four hours took us to Milwaukee, where we had the good fortune to get on board a comfortable propeller, the *Galena*, and started immediately for our destination. After stopping at various points on Lake Michigan, we arrived at Mackinac, and took up our quarters at the comfortable hotel of Mr. Franks, the Mission house.

After a short stay we had the satisfaction of seeing the *Michigan* arrive, and speedily took possession of one of her cabins; and at 11h. p.m., on the 9th of August, 1857, we started on our way to Lake Superior. At five o'clock on the following morning we lay to off Detour to inspect the lighthouse; and this being concluded, we proceeded up to the Sault St. Marie River, arriving at the canal connecting Lake Huron with Lake Superior at five o'clock a.m.

This canal, to avoid the Sault St. Marie, is nearly one mile in length, of solid masonry, twenty-five feet high, ten feet thick at the base. The gates are each forty feet wide, and there are three of them. The canal is 100 feet wide at the top of the water, and 115 feet at the top of the banks. The depth is twelve feet. This is a solid and substantial structure, and highly creditable to the engineer. The rapids of the Sault St. Marie are remarkably picturesque, presenting a very animated appearance as they are navigated by the numerous Indian birch bark canoes, constantly engaged in fishing, while they are tost to and fro in the boiling waters, dancing like bubbles on the impetuous rapids. From the entrance of the Sault St. Marie River to the canal we passed numerous rugged looking islands; the blasted trunks of trees; the rocky and barren heights, and the desolate appearance of the surrounding country, forming a scene of savage wildness difficult to describe. An hour took the good ship *Michigan* through the canal. The machinery was then put in motion, and she rapidly glided into the clear and deep waters of Tahcuamenon Bay, the entrance of Lake Superior.

About four miles brought us to Round Island, on which is situated an American light, which does good service to both American and Canadian navigation. In fact, the British trade ought to be deeply thankful to Brother Jonathan for his liberality in lighting the coast so thoroughly. The lighthouse on Round Island is similar to all

others on Lake Superior, being a plain unpretending stone and brick house, with a Fresnel light. These lighthouses are attended, according to their size and importance, by one, two, or three keepers, with a regular salary of 350 dollars per annum. In so remote a country it must be difficult at all times to secure the services of thoroughly competent men. But Uncle Sam is wise, and entrusts the supervision of these important works to the two officers already alluded to, who thoroughly understand their business.

Lying to off Round Island, the officers abovementioned landed and commenced an examination of the details of the lighthouse. This examination is very carefully conducted, and copious notes taken for the information of the Bureau. After several hours of minute supervision, during which the attacks of mosquitos were incessant and most provoking, the officers returned on board, and the vessel sought shelter for the night.

Fortunately we had, as temporary captain, an experienced superior pilot in Captain Reed. This fresh water veteran is yet a young man, and in appearance the very opposite to Old English ideas of the pilots with grizzly locks, and ready for a dangerous almost unknown and arctic sea. It was extremely amusing to see this young ancient pilot take charge of the *Michigan* and her pilotage with the greatest confidence and skill. His method of making her snug for the night was new to us. It was a simple process enough, although quite opposed to general usages on the ocean. "I guess I'll make her fast to Wheeskey Point," said our veteran, and no sooner said than done. After sundry twangs of the engine bell, denoting "a tarn ahead and a tarn astarn," we were safely fast to a wooden pier built on a remarkable tongue of land or natural breakwater, extending a considerable distance from the main land.

American steamers have a regular watchman, who takes charge of the vessel after the work is done and the ship secure. This is a very good custom, as it enables all hands to get a good night's rest. Gradually the brilliant lights illuminating the whole length of the *Michigan* were extinguished, and the good ship lay snugly, and I may say safely hugging the friendly wharf, although in an open sea more exposed, save from tide and swell, than if lashed to the Eddystone Lighthouse.

At daylight on the 11th we cast off from Wheeskey Point; and, after inspecting the lighthouse on Iroquoise Point, we stood along the coast to Whitefish Point. Here a number of half-breeds were employed in taking whitefish and lake trout. Several of these people had emigrated from Red River, and were splendid specimens of the genus homo. Those of us not professionally occupied, strolled into the sandy undulating plains of Whitefish Point in search of game. We were rewarded by a few pigeons, and saw traces of deer, which a half-breed pronounced to be those of the reindeer. While waiting here for a boat to return on board, the *Michigan* having run her nose gently on the beach, an accident happened to the author that had well nigh proved fatal. With gun in hand he had sought rest in a

flat bottomed boat that was hauled up high and dry. The gun was leaning against the side of this boat, nearly upright, and as he was raising it and stepping out to embark in the approaching boat, one of the cocks struck the gunwale, just raising it sufficiently to effect its going off. The charge rushed by his ear, just singeing his hair, and rendering him perfectly deaf for the remainder of the day. It was a narrow escape, and the only thing under Providence that saved his life, was the habitual precaution, acquired from long practice, of never drawing the muzzle of a gun towards the person.

As soon as the necessary duties were performed at White Fish Point Lighthouse, the *Michigan* stood on along the coast. Towards midnight, having run our distance, we lay by. At daylight we stood in towards Grand Island, and soon made the celebrated pictured cliffs at the southern entrance of the bay. These cliffs are perpendicular, and marked with Indian symbols; as the fog hung like a mantle over them, they presented a grand and imposing appearance. Standing along the coast, across the harbour* of Grand Island, we passed the celebrated caverns and pillared cliffs, but were somewhat disappointed by the latter. In the harbour formed by Grand Island Jonathan has not been long in discovering a good and secure place, the site of a future city, and it is fixed on accordingly. This paper city as yet is in progress of survey, and most probably will hereafter become—taking into consideration the rapid progress of the West—a place of considerable importance.

On a prominent point of the island is the lighthouse, for which our cautious (rather a rare quality) captain appeared to have a wholesome respect by stopping the engine at a safe distance. We then proceeded to land on a natural pier of sandstone rock. At the foot of an inclined railway, at the base of the cliff, we were met by the lighthouse keeper, and, with instruments, &c., were soon transported by its means to the top, 150 feet above the level of the lake.

At the extreme edge of the point stands a huge projecting sandstone rock, through which the action of the sea has excavated a passage, forming a natural arched tunnel. Our boat's crew, in the exuberance of their spirits, tried this natural channel and discovered a passage with ten feet of water in it, and in which the shrill sound of the steam whistle of the *Michigan* caused a remarkable and prolonged echo. The sound reverberated from the cliffs and high land, and was prolonged and repeated on all sides for several seconds. The view from the summit of the island well repays the visitor, and was remarkable from the exquisite clearness and purity of the air and water of the lake. A luxuriant vegetation, grass especially, clothed the surface of table land, whilst plentiful supplies of strawberries and

* In Captain (now Admiral) Bayfield's survey of this lake, published in three sheets, a work remarkable not only for its accuracy of execution but also for the geological information which it contains, it is stated that the cliffs of Grand Island (of sandstone) are 400 feet high, while those of the adjacent coast are but 300. And these cliffs are broken by the waves into picturesque caverns, pillars, and arches of immense dimensions.—Ed.

raspberries rewarded those who were inclined to scramble through the intricate thickets.

After the necessary investigation of the lighthouse had been completed (and it was impossible not to admire the extraordinary care and attention to the most minute details bestowed by the officers upon this important subject of lighting Lake Superior), we descended the cliff as best we could, reembarking in our boat from the stone pier wharf of Nature's own formation, and returned to the vessel. Onwards we immediately went, and in four hours entered Iron Bay; at the bottom of which lies the town of Marquette, where the Chocolate River falls into Lake Superior. At this point commences the great mineral district of Lake Superior.

Marquette is a city of four years' growth, and since the construction of the Sault Saint Marie canal it has advanced rapidly. There are three substantial and considerable piers extending into the bay; alongside of which were lying eleven large schooners and one propeller, loading with iron ore. A railroad, already completed some twelve miles, a tramway of sixteen, and a plank road connect each of these piers with the iron mountains.

The iron ore is said to contain from fifty to eighty per cent of the best and toughest iron in the world; and the mountains, from which the railways and roads transfer it for shipment, contain an inexhaustible supply. The production obtained with the present limited means amounts to about 200 tons a day. The cliffs of this wonderful ore are blasted with the greatest facility, and it is asserted that several hundred tons are detached at a single explosion. The cars are then loaded and run down an inclined plane to the piers, where they are dumped into the vessels' holds. The railway is being rapidly extended to the state line of Wisconsin, where it is to meet the Lake Winnebago road, now in rapid progress of construction. When this is completed—which will be in about three years—Marquette will have direct railroad communication with New York and the Atlantic seaboard. Beautiful marble rocks crop out into the harbour, and a fine variety of superior hone stone abounds in the neighbourhood.

The whole population of the county amounts to about 2,000, one half of whom are claimed by the city of Marquette. As the major part of the remainder are employed in the mines, there is literally no agricultural population. In spite of this drawback to material prosperity, there is still a look of substantial wealth about Marquette that promises a speedy and permanent growth. It is unusual in the far West to find a point which possesses such obvious advantages for speculation. The best town lots, fronting the harbour, are held at from 2,000 to 3,000 dollars (£400 to £600) each. The back and inferior lots, downwards to 250 dollars (£50). The population bear unmistakable signs of the healthful climate. All sorts of vegetables grow to great perfection, and the usual grain crops, except Indian corn, likewise flourish. We feel confident that the popular accounts of the severity of the climate of Lake Superior are very much exaggerated, and that the climate of this part of the lake, 46° 35′ N., is,

on the whole, not more severe than the climate of the North of England.*

Iron Bay, like most parts of Superior, abounds with exquisite fish: white fish, lake trout, and herrings in canoe loads were constantly alongside. One lake trout, measured for curiosity's sake, was 4ft. 10in. in length, and 65lbs. in weight. The visit of the *Michigan* was welcomed by the city people, from whom the officers in command received complimentary visits, including of course the principal inhabitants, who kindly furnished us with their news and current information of the place. Amongst them must be specially mentioned three ladies of Marquette, whose unreserved manner and delightful *naiveté* was charming to us rough voyagers. The total absence of all ceremony and etiquette on the occasion that such wild regions fully justify no doubt contributed much to render their lively manner and conversation still more charming. The summer clime of the lake, along with their own inclination, rendered bonnets quite superfluous, and all punctilious ceremony being naturally banished from their thoughts, we four desolate bachelors of the *Michigan* were highly gratified on seeing our fair friends, *sans ceremonie* as if out of their own drawing-rooms, walk on board. Seating themselves in rocking-chairs in her saloon, while they kept them in full motion, corresponding with the vivacity of their conversation, the music of their voices gave speed to the wings of time, when suddenly an unearthly howl—the steam-whistle of the *Michigan*—penetrated our inmost senses and abruptly terminated an interval of "joys too brief."

The spell was broken, leaving a picture on memory's tablet for retrospect in future years, with other scenes of sunny hours that occur in the chequered journey of life. In a few minutes the ladies were wending their way homewards while the *Michigan* was hastening on her course for Kewaiwona-ning,—a good illustration of the respect which the authorities on board of her entertained for the value of the maxim that declares duty is paramount to pleasure. The real meaning of Kewaiwona-ning is Portage River, the term *portage* (French) being applied generally to any place where canoe navigation is interrupted, obliging the canoe to be carried on land. Thus there is a canoe route across this isthmus, partly by water, but a portage from the lake is necessary to get into or out of it on each side of the isthmus; and thus the danger from rough weather in rounding the point in canoes is avoided.

At daylight on the 12th we had arrived at our destination, and immediately communicated with the lighthouse. Portage River is connected with several small lakes extending to within a few hundred yards of the portage on the opposite side of Point Kewaiwona. A short canal will cut this vast metallic point in two. Thus, as it were, Nature has prepared the way for man to obtain with facility the

* But the Editor of this Journal has seen the thermometer at 17° below zero in the winter of 1816–17 at Fort William, on the North shore.

astounding treasures now lying hid in this marvellous Point Kewaiwona. It is asserted, and that too with every appearance of truth, that this singular formation protruding into the lake like a gigantic "finger of warning," is composed of a vast concentration of mineral treasure surpassing belief. As we are about to proceed round this point, examining various lighthouses and harbours, we will endeavour to sketch out some interesting particulars bearing on this subject.

In estimating the value of the mineral regions of Lake Superior, it must be borne in mind that under present circumstances the miners are labouring under serious disadvantages. They have not only immense distances to bring supplies and necessaries of life, but during seven months in the year they are totally cut off from the rest of the world. Thus, they are obliged to secure all they want at least seven months in advance. Having hardly any agricultural population, nearly all their meat and vegetables are transported at heavy cost. Some few of the larger miners have farms in cultivation, which in some degree ameliorate their condition. But when the majority have to import hay for winter use at from 30 to 40 dollars a ton (£6 to £8), with every other article at proportionate prices, it requires an exceedingly rich yield to pay expenses and dividends. As soon, however, as this lake is tapped by the railroads through Wisconsin, there will be an immediate equalization of prices and labour, which will have the effect of stimulating the mineral districts to an extent difficult to calculate. It is for this reason that it is right to record the present value of town lots. These towns will mainly depend for their progress on the goodness of the harbours on which they are planted, and the probable chances of early railway accommodation. Once let the idea of minerals in their vicinity be proved in addition to the abovementioned advantages, and an influx of capital and population that will astonish even the sanguine speculators accustomed to the rapid and marvellous growth of western cities, is sure to follow.

At the eastern extremity of Kewaiwona Point, is Manitou Island, composed of a curious conglomerate rock. At the lighthouse on this point we found the keeper, a Frenchman and his son, who appeared delighted with the appearance of visitors. While the inspection of the light establishment was going on, the curious conglomerate rocks and pebbly beaches were occupying our attention. After heavy gales it appears that large quantities of shingle are cast up by the violent surf from the lake, and frequently agates of considerable value are secured by the lightkeepers. Our boat's crew were at once smitten with the desire of becoming suddenly rich, and spread themselves about to secure some of these precious waifs; but on coming on board they brought a heap of trash, for with them all prettily marked stones rose at once to a considerable premium.

Passing round Kewaiwona Point, three hours steaming through a shifting and occasionally dense fog, brought us to the entrance of Copper Harbour. This harbour is an exceedingly good one when a vessel is once in it; but is of difficult and dangerous access. It is formed by a shallow bay, across which a rocky spit stretches nearly

from one side to the other. The entrance left by it is narrow, and rendered particularly dangerous by several rocks awash, and slightly above the surface.

The town of Copper Harbour is some ten years old, and, including several mines, has a population of about one thousand. One only of these mines appears to be in a flourishing condition, and it is a curious fact that it is owned in Paris (France). We were informed that the whole amount of ore raised to the surface hardly paid expenses. But when we look at the terrible difficulties of transporting this ore for shipment, added to the present tightness of the money market and causes previously mentioned, the ultimate prospects of this place cannot but be considered as good. In land there appears to be little or no speculation: town lots in the best situations are held at 400 dollars; inferior positions, 150 dollars; (£80 to £30).

Being detained by thick fogs, we determined to visit the mine previously alluded to, called the Clark mine, and started accordingly in a mud wagon, the distance being three miles. Never in any part of America was there such a tangled growth of trees and underbrush. To clear this land, which had recently been sold at Government price, namely 125 dollars, the charge was 30 dollars (£6) an acre. This could not be considered a high price for such herculean labour. Vast rocks and stony ridges bounded the road on all sides, and it was difficult to believe such a rugged and apparently barren surface could support such prodigious trees and undergrowth. On arriving at the shaft we were received in a courteous manner by the superintendent and chief engineer—both Frenchmen—from whom the following particulars were obtained.

The mine has been worked about three years. The present shaft is sunk to the depth of eighty-eight feet. Present expenditure about 100,000 dollars (£20,000), but is only considered a commencement. Large heaps of copper were pointed out to us which were divided into three portions: first were lumps of pure, say 85 to 95 per cent, copper; then barrel stuff, composed of pieces up to forty or fifty pounds; lastly, stamped stuff, or pieces of rock in which native copper abounded in detached lumps and flakes, which are stamped or crushed before shipment to the port for smelting. Seeing so many rich specimens of comparatively pure copper before us, we were surprised to hear that the general results were not above two and a half per cent from the whole mass. It was expected that no dividend would be earned without a considerable further outlay and a delay of three years!

To the northward, on the side of a precipitous ridge, the miners were excavating deep trenches, in hopes of hitting the vein in another and richer portion. These particulars of the Clark mine are mentioned as it was universally considered the most prosperous in the neighbourhood.

The following morning (August 13th, 1857,) we arrived at Eagle Harbour, a dangerous entrance, and contracted space when inside. It is a small village, totally dependant upon the mines in the vicinity.

In this neighbourhood the weather is subject to sudden and violent changes, very similar to those occurring off long capes and points of land putting out into the sea. Fish are abundant, and were hauled in alongside of the wharf in considerable numbers. The population of the town does not exceed 250, and they subsist entirely on the mines and a little fishing. The town lands have but little fixed value.

After a few hours' stay we stood along the coast to Eagle River, passing the celebrated cliff mines.

(To be continued.)

THE DESTRUCTIVE AGENCY OF LIGHTNING.—No. II.—*Sacred Edifices and other important Public Buildings Burned or Partially Destroyed by Lightning.*

The destructive operation of the electrical discharge in setting fire to sacred structures and other buildings is very especially worthy of record. The following collection of some very remarkable instances, chronologically arranged, whilst possessing great public interest, may not be at the same time without considerable value in promoting our future inquiries into the nature and operation of the fearful agency of lightning.

1417.—Lightning struck the beautiful spire of the church of St. Mark, at Venice, set fire to the wood work in its construction and totally destroyed it.

1489, *August 12th.*—The same occurrence again took place, the spire having been rebuilt. The electrical discharge again assailed the carpentry of the tower, and again totally destroyed it by fire.

1745, *April 23rd.*—The church of St. Mark again struck by lightning, and the spire (now built of stone) shivered in pieces; causing an expenditure of £3000 in repair.

1755.—Lightning fell on the celebrated Eddystone lighthouse, built by Rudyerd in 1709, and set it on fire.

1759, *July 27th.*—Lightning fell on the cathedral of Strasburgh and set the roof on fire, which burned violently, so that the whole structure narrowly escaped total destruction.

1760, *April 25th.*—The fine church of Notre Dame de Ham was struck three times by lightning during the night. The third discharge set the building on fire, and the whole structure was finally destroyed.

Of sacred edifices burned by lightning in the olden time the following may be enumerated:—

The monastery of Canterbury: twice burned.

The abbey of Croyland: twice.

The abbey of Peterborough: twice set on fire.

The abbey of St. Mary, in Yorkshire: burned.
The abbey of Norwich: destroyed.
The abbey of Worcester: set on fire.
The abbey of Gloucester: burned.
The abbey of St. Mary in Southwark; partially destroyed.
The church abbey of Beverley: burned.

1822, *September 15th.*—On the night of Sunday a heavy discharge of atmospheric electricity fell on the beautiful cathedral at Rouen, and set it on fire; the whole structure was eventually destroyed. This was one of the most costly and beautiful specimens of Gothic architecture ever seen.

1843, *April 26th.*—During a hail storm, a heavy thunder cloud passed over the venerable and handsome old church of Exton, in Rutlandshire, and sent forth a terrific flash of lightning. The electrical discharge fell on the tower, destroyed the spire, and set fire to the church, which caused its nearly total destruction.

1844, *March 12th.*—A severe thunderstorm passed over the town of Donai, in France. The electrical discharge struck the steeple of the church of Fressan and set it on fire. The whole structure narrowly escaped total destruction.

1850, *April.*—The beautiful cathedral of Saragossa, in Spain, struck by lightning during divine service. The dome set on fire and the cathedral partially destroyed.

1853, *February 23rd.*—Lightning fell during a snow storm on the magnificent structure of the cathedral at Lincoln, and set fire to the carpentry of one of the pinnacles of the great tower. The boards and timbers were soon in a complete blaze, and the whole of this gorgeous building narrowly escaped destruction. The occurrence fortunately occurred during the day time—about 3h. p.m.—or the cathedral would have probably been burned.

1857, *May 6th.*—The steeple of Wesborough church, Sussex, set on fire by lightning.

1857, *August 15th.*—Buckland chapel at Portsmouth struck by the electrical discharge and set on fire.

A German writer states that within thirty-three years he finds records of the towers of 386 churches struck by lightning, and 121 bell-ringers killed. In December, 1805, the churches of St. Martin *(a vetré)*, of d'Ebré of Croiselles, of d'Etrelles, were struck in the same storm and the towers destroyed. In July, 1807, a thunderstorm overspread Guerche, when no less than ten churches and other buildings were struck by lightning and damaged within a radius of a league. In January, 1815, a thunderstorm pervaded the space between the North Sea and the Rhenish provinces, twelve steeples were struck by lightning and many of them set on fire.

On the Conveyance of Troops to India:—*Four Methods Proposed by One who has Served both in the Navy and Merchant Service.*

Method No. 1.

Mr. Editor,—Whatever may be the future form of government adopted for India, or whatever may be the steps taken with the view of repairing the fatal errors of the past, one thing is certain that we must look mainly to a large European force to hold our position in that country. This being admitted, the constant and annual supply of troops to keep up our army to eighty or ninety thousand men must now become regular, and how to make it so will require the most careful and attentive consideration.

Considering that, in round numbers, about 16,000 men will be required annually to keep up the supply, and about 3,000 men will return as invalids to recruit themselves for further service, neither of the four plans here proposed will appear at first sight the most economical, but in the end I am persuaded they will prove to be so; first, from risk and accidents being avoided, and next by health and comfort on board such ships being secured, so that every man may be landed in a condition capable of immediately taking the field.

As a nautical M.P., who knows his way to India as well as any man, has mooted the subject in the daily prints as to the conveyance of troops in H.M. ships, we will commence first with the navy, that it may be seen how far this plan is feasible, and what objections there may be made to it. On looking over the *Navy List* and examining the numerous old men of war which now lie in ordinary up the Medway, at Portsmouth, and Hamoaze, the retired hands will be surprised to find how many of the old seventy-fours are worked up into screw block-ships, and that the available ships are really not so numerous as one would expect; so that, supposing the plan to be considered worth adopting, such of the oldest ships only would be selected as are lying up, and from being out of date, owing to new improvements, are the least likely to be commissioned for the regular service of the Navy, such as those enumerated in the Table given on the following page.

From this Table it will be seen that these fourteen sail of the line and fourteen frigates would convey the exact number of 16,000 men, and that they will require 5,700 (including officers and seamen) to man them, no marines being considered requisite. Doubtless the same number of troops might be crowded into a ship or two less, but this is not far from the proportion for every one to be berthed in a sufficient space and for wholesome ventilation. The *Rodney* once carried 900 troops to the Cape, but on the whole voyage to India a less number would be found more advisable.

It is generally understood that the masts, yards, and sails, and every part of the equipment of these vessels is lying in the dockyards, all tallied for service, so that every facility is given to their immediate outfit. If, however, any material repair be found, on inspection, to be

Ship's Names.	Guns by List.	Guns as Troop Ship.	Crew.	No. of Troops.	Ship's Names.	Guns by List.	Guns as Troop Ship.	Crew.	No. of Troops.
Albion	90	26	260	800	*Alfred*	50	18	180	500
Rodney ...	90	26	260	800	*America* ...	50	18	180	500
Achille....	78	22	220	600	*Arethusa* ...	50	18	180	500
Agincourt .	72	22	220	600	*Chichester* .	50	18	180	500
Benbow ..	72	22	220	600	*Conquestador*	50	18	180	500
Canopus ..	84	22	220	650	*Cornwall*...	50	18	180	500
Carnatic ..	72	22	220	600	*Dublin*.....	50	18	180	500
Collingwood	80	22	220	650	*Gloucester*..	50	18	180	500
Egmont...	72	22	220	600	*Leander*....	50	18	180	500
Foudroyant	78	22	220	600	*Vernon*	50	18	180	500
Hindostan.	78	22	220	600	*Winchester* .	50	18	180	500
Superb ...	80	22	220	650	*Warspite*...	50	18	180	500
Vanguard .	80	22	220	650	*Portland*...	50	18	180	500
Sultan	72	22	220	600	*Lancaster* ..	50	18	180	500
			3180	9000				2520	7000

required for these vessels, the whole project would fall to the ground, as decidedly it would not be worth the expence to enter upon such repairs. But any merchant would naturally ask the question, what is the use of keeping so much capital lying useless? If the ships are not fit to carry troops and our new and improved ships are so numerous, why not break them up altogether?

But supposing they were put into requisition, it may be useful to draw comparisons with other plans, and to consider how such vessels could be despatched with the greatest safety and rapidity; and in doing so officers will do well to follow the example of those ships which have made the most rapid and successful voyages, and to remember that in proceeding to India the seasons are of immense importance. An eminent British shipowner, who for twenty-five years has averaged a fleet of twenty-eight ships to India, has never lost one which went in season during the whole of that time, but three have been lost which went out of season; so that this result of twenty-five years' experience may be taken as a practical proof of the admirable manner in which these ships have been managed and navigated.

Sailing ships should therefore leave England for India only three months in the year, viz., from the 15th of June to the 15th of September. They then meet with little or no bad weather, run no risks, and arrive at a season quite healthy for Europeans. Supposing that four of the larger ships and four frigates left England together, they should have four screw steamers to *sail* in company till they lose the N.E. trade, and then to tow them across the calms of the line, each taking a line of battle ship with a frigate astern, and leaving them

when they reach the S.E. trade. These steamers having done this work, might then look out and fall in with the next coming on, agreeing as to the longitude for crossing the line, if no particular service presses they might cruize for them for a time. By this assistance the voyages to India would rarely exceed 80 days, all possible sail being carried.

It has been observed by those who have been many voyages to the Brazils in the mail steamers, that much stronger winds prevail near that coast than so far Eastward on the line as 21°, where Horsburgh recommends it should be crossed. The meridian of 25° or even 27° West, is recommended to avoid so much calm and heavy rain. The larger ships will not be able to go up to Calcutta, but can lie at Diamond Harbour.

The approximate amount of the pay and maintenance of the 5,700 men, officers and crews of these troop ships, will come to about £60,000 per annum less than the average contract conveyance by sailing vessels; but no expense of repairs is taken into the account. It must be considered, however, that this would be essentially part of the naval force of the country. The men, entered for three or five years, (for good seamen do not like entering for ten,) are always available on arrival for any sudden emergencies, either in those very ships, or the more modern approved vessels of screws or gunboats. It must also be evident to all men of experience that owing to the general use of steam both the navy and merchant service is very much falling off in seamanship; and here would be an opportunity of keeping it up, as these vessels must be kept entirely under all possible sail. This service would also produce the very best navigators, as no masters would be required; for after all we hear about improved education in the navy, if the officers of these ships cannot navigate them as well as the officers of Indiamen, then these first class college examinations are mere empty display.

Method No. 2.

To follow out either of the three next methods would require so much supervision and control to effect the safe and satisfactory conveyance of troops to India, that a most efficient Transport Board would be indispensable, which should combine the whole experience necessary in every detail. A Board, such as the following, should be formed with extensive powers and presided over by an Admiral, who has served in India; his colleagues should be a Captain and Master, R.N., who had also served in India, and two Commanders of East India ships as above, who have commanded at least four voyages, and who have made the most rapid and successful voyages without accident, and who hold no shares or interest in any description of vessels. With them should be associated a staff officer from the Horse Guards, who has been a voyage round the Cape, which officer being in constant communication with the Commander-in-Chief's department, would save a mass of correspondence, and ensure the combined action of the

naval and military authorities as to the time and points of embarkation, &c*. A Company should be invited to tender as to the terms on which they would engage to convey 16,000 troops to India, more or less, and 3,000 home, more or less; the price per man, and on a contract with certain stipulations.

This Company should be designated the East India Transport Company, with a capital of £1,200,000, requiring thirty vessels of about 1450 tons each, built according to approved model, and the value of each ship to sea would be in round numbers £40,000.

Stipulations in contract would be:—First, ships to be built on a certain specification and under the inspection of a Surveyor appointed by the Transport Board.

2nd.—Ships to be hired for twelve years, and after six years a proper repair to be gone into to insure a fitness for service for the remainder of the term.

3rd.—Ships to go into dock after every voyage, copper to be examined, masts and spars inspected.

A crew in the proportion of five men before the mast to every 100 tons, (three able seamen two ordinary,) also six apprentice boys. No foreigners to be shipped except in the proportion of one-fifth of the crew.

4th.—Engagements as to anchors, cables, sails, cordage, and other stores, the whole to be subject to the control of a nautical Surveyor appointed by the Transport Board.

Before deciding on a model ship, a visit should be paid to such vessels as the *Marlborough*, *Blenheim*, or *Alfred*, at Blackwall, ships that are best adapted in every way for the purpose of conveying troops. In fact, it is most probable no improvement could be made in such models by which to build new ships, unless a few feet more length in the bow were added to coincide with the latest notions of naval architecture. Longer ships, however, are more liable to accidents, requiring so much more room to wear round if caught in a heavy gale on a lee shore. In these ships the whole of the lower deck may be given up for the troops, also the space from the first beam before the fore hatch in the main deck to the after part of the main hatchway. This space would make room for 530 to 550 in each ship, which would make up the number required.

It could easily be shown that a Company thus formed would not only convey troops with certainty, safety, and dispatch by sailing in season; but it would also have a fair remuneration for shareholders, and in this manner we will now take the average price for troops by contract. In ordinary times, and call it at a guess, £13 per head out, and £20 home. Then for 16,000 out and 3,000 home, will be paid by Government £268,000 per annum. It is not intended that this

* Should the superintendence of the embarkation of troops still belong to the East India Company, an efficient Transport Board, under *their* authority, would still be necessary to ensure the selection of proper vessels, and for the strict supervision as to their manning and outfit, as well as ready communication with the Horse Guards.

should be the sole profit of the voyages, as without any detriment to the public service, or lumbering the ship's decks, a considerable homeward bound cargo might be carried, although certainly none outward. The average of 100 invalids home could be taken on the main deck space before alluded to, such part of the lower deck and hold not required for provisions and water might fairly be appropriated for cargo, and passengers home might be taken so long as they did not turn out the military or ship's officers from the cabins properly allotted to them and which they should retain as a matter of right.

Officers of troops taking their families out should also pay something for the extra accommodation, and a purser should be on board who should superintend the table and see that the Company's orders as to a fair and liberal mess were observed. An officer under the authority of the Transport Board should muster the crew out and home, and see that the upper deck was perfectly clear for working ship, and that the vessel did not exceed the proper draft of water.

Method No. 3.

By this plan it is proposed to carry on the same service of conveying troops by means of an East India Steam Transport Company, with ten screw steamers and four reserves, and in comparing the merits of the two plans we must consider what has been done by the very best screw steamers on the late emergency as to the rapid conveyance of troops. The best voyage seems to have been performed by the *Golden Fleece*, which, in 60 days from England made her appearance off Galle, in Ceylon, with upwards ot 900 troops in perfect health. Allowing four days more for the passage to Calcutta, her voyage would be 64 days. Now the average of six voyages of the East India sailing ship *Nile*, of 1200 tons, has been 77 days, one voyage of which was only 72 days to the Sand Heads. We may take therefore as an average that such screw ships would beat the best sailing ships by thirteen days, having to stop at two different ports for coals. From what is said of the professed performances of these vessels they could accomplish two voyages to India and back in one year, or if not exactly so the reserves would make up the deficiency.

A Company of this sort could be formed with the capital now in hand in a good class of vessels, carrying on an average 800 troops each, and thus in the ten vessels twice a year the required number might be conveyed.

Although in our late emergency no doubt it would have been of immense advantage if all the troops could have gone out this way, yet it would be for consideration whether in settled times the difference of expence would be acceded to. From the average of prices it seems the expences of these vessels are so great that it is not likely a Company could afford to carry troops at anything less than two thirds more expense than that mentioned for the sailing vessels. In fact, £40 per head, both out and home, would scarcely pay them even with thu privilege of the homeward freight and passengers.

Should this plan ever come under the control of the Transport

Board, a strict revision would be requisite on their part as to the number of officers and men necessary for the safe navigation and look out on board these large steamers, which are, without exception, the most valuable that leave this country. A code of regulations also, short, concise and explicit, should be made out as to the duty and responsibility of each officer; and full confidence with sufficient discretionary power should be given to the commander. The best officers should be encouraged in every possible way to enter this service, which, if it ever falls into inferior hands, will be attended with the most fatal results. Officers should not be so often changed from one ship to another, which prevents their taking proper pride in keeping their ships in order; and a full complement of officers should always be kept up. They should also have their assigned cabins, which they should not be deprived of under any pretext whatever.

Method No. 4.

The fourth plan may be considered merely an improvement on that at present in force of general tender, with such restrictions in the contract as will entirely prevent the great injustice done to the troops now by the indiscriminate hiring of the cheapest ships without reference to the qualities absolutely necessary for their safe and rapid conveyance. It will be as well first to take a glance at the evils of the present system, and then suggest a remedy, one that would require the utmost vigilance of the Transport Board to enforce, notwithstanding that a surveyor should be employed as well for the examination of the hull, spars, &c., as a nautical surveyor for the manning, state of rigging, stores, &c., as well as every particular as to fitness for an Indian voyage.

The plans now pursued give every encouragement to the employment in this service of the most inferior and dullest sailing vessels, and hence the best class of vessels, 50 per cent. better for the purpose, go out empty. These dull sailers are found lying in the Downs, with lumbered decks, unable to move till the wind comes fair, while others, much larger indeed, fine frigate-built ships, are seen working down channel with the greatest ease and rapidity. This practice is nothing more nor less than a fraud upon the Government and an imposition on the officers and men of the army, who are unable to discover their predicament till fairly off, and too late to make any representation about it. Soldiers for years have silently borne this kind of treatment, and even in the recent remarkable case of the *Austria*, taking out the unfortunate 94th, we see no complaint from the officers. The *Austria* was a Belgian screw steamer, officered and manned *entirely by foreigners*, with the exception of two British subjects, Scotch engineers. The case is too long for further reference here,* but after suffering every sea misery short of foundering, she put back a second time into Plymouth disabled. Happily the troops of the *Austria* are now, however, on their way in one of the P. & O.

* See a following page of this number.

steamers for Alexandria, so all amends are now made them for the trials and hardships they have endured in a specimen of an English built ship manned with foreign seamen.

Independently of the suffering of the troops when so long shut up in dull sailing ships, there is also much greater risk in these vessels from the frequent necessity of putting into port. Again, when the voyage is half over, an apprehension often exists of shortness of provisions and water, and a commander is induced to put into Table Bay, or to call off Algoa Bay, which is always an additional risk in that sort of ship.

Under the present system it is quite possible that a ship may have passed muster with the shipwright surveyor, and decks be reported fit for troops, and still, from other causes, she might yet be entirely unworthy. An old commander in the merchant service employed as a nautical inspector, going on board, honestly to do his duty, would be very likely, on examination, to find the following defects. He might first observe that she is a heavy teak ship, of about 800 tons, built at Moulmein, with a square bow and three feet by the head, likely to be six months on the passage. On going on board he might find a wretched crew of 28 hands before the mast, mostly Lascars, stowed away in a miserable wet forecastle. He might then discover light anchors, and short cables, no hawser, stream, or kedge anchor, chafed stoppers and catfalls, large ropes and small blocks, stranded footropes, slop canvas, rotten lifts, and along with these a cheap captain!

To prevent the possibility of a recurrence of these evils, no ships hired for troops to India, should be under 1000 tons, and the false tonnage so common in advertisements should be specially guarded against. Ships under that size are not sufficiently dry and comfortable for troops, and are sometimes unable to stow away under hatches the quantity of stores and baggage required; for no lumber whatever should be allowed on deck; dead weight should be limited for the proper trim, and cargo not allowed to interfere with the requisite space for provisions and water.

The number of foremast men composing the crew should also be specified in the contract, in the ratio of at least four men to every 100 tons register, (three able and one ordinary,) and one apprentice before the mast to every 200 tons. The number of foreigners should not exceed one fifth. When ships are tendered, none should be engaged until they are either inspected by two of the Board, or their deputy, or known to them as fast sailing and proper ships for the conveyance of troops, and to the usual advertisement should be added the following words:—"It is to be distinctly understood that the Transport Board do not pledge themselves to take the lowest tender unless the ship appears to them as to sailing qualities or otherwise well adapted for the conveyance of troops to India. Specification as to the terms of contract, manning, outfit, &c., will be shown on application at the office."

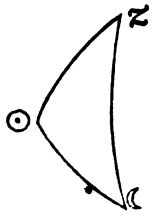
Although either of these four methods of conveying troops to India will require more pains and energy than has as yet been applied to

the subject, those who have the credit of carrying it out will at all events have the satisfaction of ensuring the safety of British troops; and it will not require from them one tenth part of the exertion which *they* have made for the maintenance of the honour of their flag, and the dignity of their country.

SHORT METHOD FOR CLEARING THE LUNAR DISTANCE.—*By Lieut. John Murray, R.N., Commanding H.M.S. "Skipjack." Communicated by the Hydrographer.*

This is in principle identical with Raper's approximate method, No. 844; but under a different arrangement involves a less amount of logarithmic computation, and affords great facilities for the detection of errors, inasmuch as the ratios are found in the form of natural numbers, which may not exceed $\pm$ 1, and each is found in two parts, so that the process, short as it is, is divided into 4 or 6 separate steps, an error in any one of which will by no means affect the accuracy of the rest, whilst it immediately betrays itself.

A consideration of the theory will demonstrate the rigorous exactitude of which the method is susceptible, and which seems never to have been sufficiently appreciated. Now that navigators are taught to know + from —, it is to be hoped that the occurrence of those signs in the formulæ will prove no bar to the usefulness of the method, whilst the mathematician will apprehend them at a glance.



Let Z be Zenith, ☉ Sun's apparent place, and ☾ Moon's apparent place.

Then cos. Z = cos. ☉ ☾ cosec. Z ☾ cosec. Z ☉ — cot. Z ☉ cot. Z ☾. But Z, the difference of azimuth, is a constant, being unaffected by parallax or refraction, ∴ differentiating for ☉ ☾ and Z ☉ we have $\frac{d\odot\,\mathbb{C}}{d\,Z\,\odot}$ = cos. Z ☾ cosec. Z ☉ cosec. ☉ ☾ — cot. ☉ ☾ cot. Z ☉ = solar ratio. Also $\frac{d\odot\,\mathbb{C}}{d\,Z\,\mathbb{C}}$ = cos. Z ☉ cosec. Z ☾ cosec. ☉ ☾ — cot. ☉ ☾ cot. Z ☾ = lunar ratio.

The solar ratio is in fact = nat. cos. angle at ☉, and lunar ratio = nat. cos. angle at ☾.

Now solar ratio × sun's corr. of alt. will be amount of corr. of dist. due to ☉'s displacement.

And lunar ratio × ☾'s corr. of alt. will be amount of corr. of dist. due to ☾'s displacement: unless the lunar ratio should be found to

vary materially within the limits of the ☾'s corr. of alt.: that is, when computed with apparent, and then with true elements. This a few trials will show that it does not, the greatest discrepancy under these circumstances being about 9″, whilst the mean of the two will demonstrably be absolute truth within a small fraction of a second; an accuracy which can by no means be obtained by the trigonometrical method, even putting aside the extreme delicacy of the trigonometrical computation and its great liability to trifling errors, which, once creeping into the chain, can never be eradicated without starting afresh; a consideration which has practically led to the almost entire disuse of the lunar observation for marine purposes; whilst by this method the different steps being entirely independent of each other, an error if it does creep in may be easily detected and rectified, and from the simplicity of the computation is little likely to occur at all.

Rule.—Put ☉ for sun's app. alt., ☾ for moon's app. alt., and D for app. distance.

Then solar ratio = sin. ☾ sec. ☉ cosec. D — tang. ☉ cot. D

And lunar ratio = tang. ☾ cot. D — sin. ☉ sec. ☾ cosec. D

For the solar ratio, add the logs. of each term to 3 places of decimals, take 10 from the index, take out the natural numbers to 2 places, subtract less from greater, and make sign + or — according as the first term is greater or less than the second.

For lunar ratio proceed the same way, only using logs. to 4 places, and natural numbers to 3 places.

If D exceed 90, cot. D being negative, both terms of solar ratio will become +, and both of lunar ratio —, take ∴ their sums instead of their differences.

Multiply each ratio into its corresponding corr. of alt. and apply the product according to the sign of the ratio, to the app. dist., the error of the resulting distance will rarely exceed 5″ and not often 2″.

For perfect accuracy compute a second lunar ratio with the true elements, using them (as always) to the nearest minute, and multiply half the difference of the two lunar ratios into the moon's corr. of alt.; if the second lunar ratio be greater than the first, apply this second correction to the distance the same way as the first correction was applied; but if the second ratio be less, apply the correction the opposite way; the result cannot err by 1″

Example.

It will be found convenient to tabulate the necessary logs. as follows before beginning.

D less than 90°.

	° ′	Sine.	Tang.	Sec.
☉	48 0	9·8711	·0456	·1745
☾	69 48	9·9724	·4342	·4618
		Cosec.	Cot.	
D	55 47	·0825	9·8323	

⊙		☾	
9·972	·046	·4342	9·8711
·174	9·832	9·8323	·4618
·083			·0825
·229	$\overline{1}$·878	·2665	·4154
= +1·69	= −·75	= +1·847	= −2·608
− ·75		−2·603	
= + ·94 Solar ratio.		= −·756 Lunar ratio.	

⊙	☾	D
51″ Corr. of Alt.	18′ 39″ Cor. of Alt.	55° 46′ 34″ App. Dist.
× +·94 Ratio	= 1119″	+ 48 ⊙ Corr.
= +48″ Corr. of D	× −·756 Ratio.	55 47 22
	= −846″	− 14 6 ☾ Corr.
	= −14′ 6″ Corr. of D	55 33 16
		+ 2 ☾ second Corr.
		55 33 18 True Dist.

☾ Second Ratio computed with
⊙ 47° 59′
☾ 70 7
D 55 33
} Amounts to −·752

Raper, p. 224, quoting Inman, says, 55° 33′ 19″ !

∴ half diff. = ·002 × 1119″ = 2″·2 applied to dist. the opposite way to first corr. inasmuch as second ratio is smallest.

D greater than 90°.

° ′	Sine.	Tang.	Sec.
⊙ 41 9	9·818	9·941	·123
☾ 24 59	9·626	9·668	·043
	Cosec.	Cot.	
D 108 17	·022	9·519	

⊙		☾	
9·63	9·94	9·668	9·818
·12	9·52	9·519	·043
·02			·022
$\overline{1}$·77	$\overline{1}$·46	$\overline{1}$·187	$\overline{1}$·883
= + ·59	= + ·29	= −·154	= −·764
+ ·29		−·764	
= + ·88 Solar ratio.		= −·918 Lunar ratio.	

⊙	☾	D
55″ Corr. of Alt.	51′ 17″ Cor. of Alt.	108° 17′ 24″ App. Dist.
× + ·88 Ratio	= 3077″	+ 48 ⊙ Corr.
= +48″ Corr. for D	× — ·918 Ratio.	108 18 12
	= —2825″	— 47 5 ☾ Corr.
	= —47′ 5″ Corr. of D	107 31 7 True Dist.

This example is calculated to a place of decimals less than is necessary to ensure accuracy, and the second correction is not applied at all, yet does it come within 2″ of what Raper (page 229) gives it.

The following hypothetical example has been selected with data so proportioned as to be a more severe trial of the accuracy of the method than can well occur in practice. ⊙ has been assumed to have no corr. of alt., for it would increase the number of figures without increasing the nicety of the conditions of the case.

	°	Sine.		For Second Ratio. ° ′	Sine.	
⊙	80	9·9934		⊙ 80 0	9·9934	
		Tang.	Sec.		Tang.	Sec.
☾	70	·4389	·4659	☾ 70 20	·4469	·4730
		Cosec.	Cot.		Cosec.	Cot.
D	15	·5870	·5719	D 14 42½	·5953	·5809

☾		For ☾'s Second Ratio.	
·4389	9·9934	·4469	9·9934
·5719	·4659	·5809	·4730
	·5870		·5953
1·0108	1·0463	1·0278	1·0617
= +10·252	= —11·125	= +10·661	= —11·527
—11·125		—11·527	
= —·873 Lunar ratio.		= —·866 Second Lunar ratio.	
× 1200″ ☾ Corr. of Alt.		—·873 First ratio.	
= —1048″		= ·0035 half diff.	
= —17′ 28″ ☾ Corr. of D.		× 1200″ ☾'s Corr. of Alt.	
		= +4″·2 ☾'s second Corr. of D.	

D	
15° 0′ 0″	App. Dist.
— 17 28	☾'s Corr.
14 42 32	
+ 4	☾'s second Corr.
14 42 36	True Dist.

This example when worked most carefully by the rigorous trigonometrical method, rejecting all short cuts whatever, gives true dist. 14° 42′ 38″, a difference of only 2″ in excess of the result at first obtained, and even this difference is probably due to the cumulative error of the trigonometrical calculation by logarithms.

On the Advantage of Using the Paumban Pass:—*or, the Importance of the Paumban Channel as a Route for the Mail Steamers Considered. By P. Cracroft, Captain R.N.*

A weekly mail for India being established, the present seems a favourable moment for directing attention to the advantages that would be gained by using the Paumban Channel instead of passing round Ceylon, and thus shortening the voyage between Aden and Calcutta fully 360 miles.

The results of the partial opening of the Paumban Pass for the convenience of the coasting trade, proved to be so encouraging, that there seemed not long ago to be a prospect of the works being continued for its further development. Surveys were made and reports called for by the Madras Government; but the Indian mutinies, which have rendered this important improvement more than ever desirable, it is to be feared have placed this and probably many other useful works on the shelf for the present.

On a subject of such extensive interest and importance as that before us, doubtless much more might be said than can be compressed within the limits of a few pages. Nautical men may not be altogether agreed as to the practicability of ever navigating large steamers through that Pass; but if it can be shown that the Gulf of Manaar and Palk Straits are easy of access in all seasons; that no dangers exist which cannot be buoyed off or lighted, and that a cut of sufficient dimensions can be made at a reasonable cost, then there can be no question that the country ought not to be saddled with the cost of more than thirty-seven thousand miles extra steaming annually, to say nothing of the delay to the mails and in the transport of troops, which, for the same period, would amounty to *sixty* days at least!

But there would be yet another and no small advantage to shipping by establishing a route through this Pass, namely, that of avoiding what has been described by that experienced navigator, Capt. Biden, in the *Nautical Magazine*,* as "a great and embarrassing difficulty, the force and direction of those extraordinary currents that generally prevail along the South coast of Ceylon," and which, he says, set in both monsoons "with such strength and variation in their course as to perplex and deceive the most cautious and skilful navigator."

* See vol. for 1848, p. 58.

The most important evidence in support of the project is the Report of Col. Cotton, the Chief Engineer in charge of the works for deepening and widening the Pass. It is there stated,—

1st.—The success up to this time (1854) has been complete, both as respects the accomplishing the object, viz., that of permanently deepening and straightening the Pass, and also as respects the advantages gained by doing it. The Pass, instead of a depth at high water neap tides of about five feet, and excessively crooked, so that dhonies without keels, even after discharging most of their cargo, would be often days getting through, when the current was strong, has now a depth of 10½ feet, and is very nearly straight, so that keeled vessels can pass through in either direction without delay, and without discharging cargo. Vessels of two hundred tons have passed through.

The trade has increased from 17,000 tons in 1822, to nearly 160,000 tons in 1853, and the freight has been reduced more than one half between Colombo and Negapatam, showing a saving on the whole trade of at least five lacs of rupees a year, and with a trade still rapidly increasing, there is no doubt that within a short time the gain to the country will be two hundred per cent. on the outlay.

Now, is it too much to inquire why the improvement is to stop here?

The report goes on further to state that all the supposed possible difficulties have been proved to be quite imaginary: "the work accomplished shows that the question is simply that of the cost of removing a *certain known quantity of material.* It was questioned at first whether the channel would not silt up again as fast as the material was removed; but there has been no silting up, and it is impossible there should be.

"There is four fathoms water and upwards up to the Pass on both sides from the open ocean, so that there is nothing to prevent the Pass being entirely open for all vessels.

"The distance that would be saved by the Suez steamers in passing through this strait would be 360 geographical miles, and the time, consequently, thirty-six hours. The saving in money, with a weekly communication, would be 200,000 rupees a year, or in this one item the interest of fifty lacs.

"The removal of sand by means of the steam dredge is so simple and cheap, and it can be done so rapidly, that the cutting through the rock and coral is the only serious and expensive part of the work.

"The rocky part of the Pass will be about 800 yards long, marked by posts on each side, and the water will be perfectly smooth, so that probably seventy "yards' width will be sufficient for the large steamers. It must of course be lighted at night.

"Under these circumstances there seems to me no question whatever about the importance of immediately opening the Pass completely, if it can be done within a sum that will not be excessive." And this sum, without entering into a lengthened detail, is estimated by the colonel to amount to 1,468,000 rupees, or under £150,000 sterling,—equivalent to an annual charge on the Madras Treasury of 60,000

rupees a year, or £6,000, a sum which will surely be considered altogether insignificant (independant of all saving in coals*) for the hastening of the mails a day and a half. These works ought not to fall on the Madras Government. It is an Indian work and is probably of less use to Madras, in a money point of view, than to the other two presidencies.

But it would be easy to raise this amount, so that the Pass should be no charge to the Treasury, by a small passing toll. The present Suez steamers are about 90,000 tons a year (forty-eight vessels of 1,800 tons), and when a weekly line is formed it will be 180,000, even supposing the vessels are not increased in size, as is now being done; so that there can be no question that in a few years there would be, including other steamers 200,000 tons a year; and as the present trade in sailing vessels is 160,000 tons annually, consisting entirely of coasters, and these rapidly increasing, there can be no question that when opened for large vessels that trade will soon be 300,000 tons a year. The following, therefore, would be the estimate of the toll:—

200,000 tons of steam shipping at ¼ rupee .	50,000
300,000 tons of sailing vessels at 1 anna . .	20,000
	70,000 rupees.

This charge would be equivalent to £45 on each voyage in the present large steamers, while their saving in coal alone would be perhaps £100.

From the above calculation we may confidently expect that if the complete channel is begun soon and finished in three years, there will be a trade of 500,000 tons a year through it soon after; and that we may endeavour to form a judgment of the actual value of a deep channel here in money, the following estimate is given:—

300,000 tons of sailing vessels saved 360 miles of distance at an average of 2 pice per ton per mile .	10 lacs.
200,000 tons steamers ditto at 3 pice per ton per mile	10½ ,,
Total saving	20½ lacs.

The reason why the sailing vessels are rated so high as two pice per ton per mile is that the great mass of the sailing tonnage will be small coasting vessels, which are worked at a much greater expense per ton than large vessels; for instance, the freight from Negapatam to Colombo, 260 miles, is four rupees or eight shillings, or about three pice per ton per mile.

Thus much for the Engineer's Report, and in the words of Captain Biden, there can be no doubt in a national and a commercial point of view that a successful completion of so great an enterprise would be of the utmost importance. Now for opinions upon the hydrographical

* The saving in coals would amount to almost double this sum:—104 voyages at £100 equal to £10,400; or if only twice a month, 48 voyages at £100 equal to £4,800.

part of the subject, that have been carefully collected from various sources.

Captain Biden, in his Report, considers that the track through the Pass is beset with narrow channels and dangerous shoals, which cannot be passed during the night, but further on he states that a light on Cape Comorin would "enable steamers to enter the Gulf of Manaar at any hour of the night, and their approach to the dangers off the eastern entrance of the Paumban Channel would be indicated by regular soundings of from twelve to seven fathoms; while another guide would be the light he recommends also to be placed on the island Ramisseram."

Sir James Elphistone, an experienced seaman who knows the locality well, considers that on the Manaar side there is no obstruction whatever; and on the eastern side (Palk Straits), if the narrow part of the strait between Ceylon and the banks lying off Point Calimere were lighted by a stationary light on Ceylon (Point Pedro), and a floating light on the banks, vessels might run for the channel in the night with perfect safety.

Horsburgh gives directions for sailing through Palk Strait, "which is considered safe for large ships." He says, "The channel is about three leagues wide from the N.W. point of Point Pedro Shoal across the five fathom bank, in a W.b.N. direction, to a bank of three fathoms, sand, which bounds it on the N.W. side. This three fathoms bank bears N.W.b.N. from the gap in the trees, distant three leagues from the nearest part of Ceylon, having regular soundings of six and seven fathoms between it and the island till close to the shore; and the five fathom bank, of an elliptic form, occupies the space between it and the North end of Point Pedro Shoal."

As regards the prevailing winds, opinions appear to differ. Captain Biden says, "the Gulf of Manaar is exposed to severe gales and a heavy sea in both monsoons." But other equally experienced seamen say that these gales are much exaggerated, they rarely blow home; and that in the journals kept on the oldest cocoa-nut properties in the vicinity, only one gale since 1842 is recorded which was attended with any damage.

The *Nautical Magazine* for 1856, p. 556, states,—"In Palk Bay during May, June, and July, S.S.W. winds are violent (a weather shore remember), and at the change of monsoon on the East coast of the Island of Ceylon alternate land and sea breezes are found. * *

"During the N.E. monsoon on this coast the weather is fine, with fresh *breezes* from North and N.b.E. In December and January it blows *fresh* from the northward. In the Gulf of Manaar the N.E. monsoon is sometimes very strong (a weather shore). It is said during the monsoon in this gulf that at about thirty miles South of Cape Comorin the atmosphere is free from cloud or mist, a condition which indicates the limits of rain and bad weather. But this is doubted, and it is considered that on the West coast of Ceylon the same weather is experienced as on the Malabar coast."

It is confirmed, however, by Mr. James Steuart, late Master-At-

tendant of the Port of Colombo, who states in the *Nautical Magazine* for 1834, p. 648,—"What is strictly understood by a gale of wind is a rare occurrence at Colombo; this may be owing to the vicinity of the equator. The strong gales which blow on the Malabar coast are only felt in small squalls and a high sea."

On the important subject of currents the evidence is very conclusive and satisfactory, for by the proposed route vessels will no longer have to encounter the perplexing ones which have been found to run in the S.W. monsoon at the rate of four miles an hour (see *Nautical Magazine* for 1848, p. 58,) and in the N.E. monsoon are estimated at from forty to forty-eight miles, and, under certain circumstances, to ninety-four miles a day along the coast of Ceylon.

In the *Nautical Magazine* for July, 1857, p. 340, is the following notice of the currents in the Gulf of Manaar:—"Throughout the Gulf of Manaar the currents are uncertain during the N.E. monsoon; sometimes, however, they have been found to run to the S.W. (through Palk Straits) at the rate of eighteen or twenty miles.* From May to September, during the S.W. monsoon, a current runs into the gulf at the rate of eight miles a day. Running to the northward, it follows the direction of the coasts and sets into the bay of Palk, to make its exit between the points Pedro and Calimere."

The tides are irregular; the general time of high water on the full and change of moon is at 1h. 30m., and the average rise and fall 2ft. during the months of December and January, when the soundings were taken (in 1837). The flood sets over the dam to the southward, and after passing the sandbank meets the tide which sets to the westward along the South side of Ramisseram towards the Madura coast. The ebb sets through the channel to the northward, but is scarcely perceptible, during the N.E. monsoon, and then only one or two hours before low water, springs; this is caused by the strong current which sets through the channel to the southward during the N.E. monsoon at the rate of three miles per hour. The ebb tide checks this current but not sufficiently to stop its course, except on the springs.

Horsburgh says, "It is high water here about 3h. on full and change of the moon, and the tide rises four feet; the current runs three and a half miles through it to the S.W. in February, and probably during most part of the N.E. monsoon, and it may be supposed to run in the opposite direction during the other monsoon."

From the foregoing it may be fairly concluded that there is nothing in the tides, currents, and winds, nor, when properly lighted, in the approach to the Pass on either side, to prevent vessels from standing in for the entrance to it at all seasons by night as well as by day. The shelter and accommodation that would be afforded them when there, and convenience for coaling steamers, have therefore now to be considered.

To the South of the Pass the islands and coral reefs effectually provide a sheltered anchorage from the S.W., the most exposed point, and

* It is stronger in the artificial channel, which will be noticed further on.

this anchorage or harbour by the Trigonometrical Survey extends in length, for ships drawing eighteen feet water, upwards of a mile and three-quarters, by half a mile wide in the narrowest part; and here the coaling depôts might be stationed, or a jetty run out into that depth about 150 yards from Coonducan Point, or into deeper water if necessary. On the North side, in Palk Straits, there is no shelter; but a breakwater, which need not be of any great length, as it would never have to shelter many vessels, might be easily and cheaply constructed, the seas on this side being so light that a very slight work comparatively would answer the purpose. The cost of such a breakwater is estimated by Colonel Cotton not to exceed 20,000 rupees, or £2,000.

Having now noticed the most important points connected with the proposed route, it will be necessary to allude to the objections that have been urged against it. Doubtless there will be no want of these: such, for instance, as suggested themselves twenty-five years ago against the route across the Isthmus of Suez, crossing the Atlantic by steam, &c., for people are always inclined to think more of new difficulties and dangers than of those to which they have been accustomed, or which have been overcome.

One of these objections is that Ceylon will lose the advantage of having her mails landed near Colombo. To this it may be replied that, in consequence of the inconvenience of Galle as a packet station, it has been more than once seriously proposed to land the mails at Trincomalee. But Paumban is only 120 miles from Colombo, and a small steamer might easily convey the mails to that port from the Pass without any loss of time compared with the present mode of conveyance; or they might be transferred to a small steamer at Cape Comorin, and so conveyed to Colombo.

The objection that vessels would not be able to approach the Pass at night has been already disposed of. It should not be forgotten, however, that steamers cannot go into Galle, which is a most difficult and dangerous harbour for large vessels to attempt at night; so that there could be no loss of time on that account, compared with the present route; while there would be this decided advantage, that instead of being kept outside all night when they did not reach Galle before dark, exposed, in the S.W. monsoon to a tremendous sea, they would at Paumban run into smooth water, and go immediately alongside the coal hulk or jetty.

Captain Biden considers that the cut proposed by the Engineer is too narrow and that it should be not less than 300 yards wide; but it is quite impossible that there can be any necessity for this enormous width. The water in the Pass will be perfectly smooth, and the current, never more than three and a half knots (and that not often), flowing exactly in the direction of the channel—as well might the entrance of Portsmouth Harbour not be considered wide enough. He also considers the channel ought to be carried out into a depth of twenty-four feet on both sides, and there can be no question that this would be necessary, but the extra expense could be easily ascertained

There would be no engineering difficulty involved, but simply the removal of a few more tons sand or mud. The bottom is sand and rotten coral, mixed with blue marley clay; there is no moving sand at the bottom and the scour of the current keeps the Pass quite clean.

The Report of Mr. Franklin, the Secretary of the Marine Board at Madras, is very short. He is evidently not inclined towards the proposed route; he "acknowledges the difficulty of navigating the Thames, Hooghly, and elsewhere to be greater than that of the Paumban Channels, but is of opinion that no large ships, or even steamers, would attempt the passage, notwithstanding that the channels themselves offered no impediment." Upon what grounds he arrives at this extraordinary conclusion it is impossible to conjecture, more especially after having just before stated that the improvement of the Paumban Channels has been the means of promoting a very active trade between the South-eastern coast of India and Ceylon. Further on he says the opening of the Pass was "formerly a question of vital importance," but "now it is only a question of time," as if a day and a half saved in the transit of the mails to Calcutta, the Straits, and China was of small consideration.

It will be quite unnecessary to enlarge upon the advantages that would result to the Island of Ceylon and the districts of Tinnevelly, Madura, and Tanjore if these improvements are carried out,—they are self-evident. A good harbour would be invaluable. Supplies could be procured in any quantity, and the local proprietors would forward the undertaking by every means in their power. The Ceylon Government, there is no doubt, would contribute largely towards the expenses. There can be no reason, therefore, why the people of England should be called upon to pay for thirty-six thousand miles extra steaming—to say nothing of the delay—when a passage can be made by which all this detention and expence would be avoided.

The Principal Evils of our Merchant Service.—No. V.

The Décret Disciplinaire. Chapter 2.

It is to be observed that the French, in the management of their mercantile marine, separate their "infringements" of discipline into three degrees of importance, viz.:—*Faults* of discipline, *offences*, and *crimes;* the first of which do not seem of sufficient importance to be taken through the tedious formalities of any tribunal; but in the degree of offences as well as crimes their punishments are remarkable for their long terms of imprisonment.

It is to be hoped that the very prospect of these protracted imprisonments in the minds of delinquents has the effect of preventing the commission of offences, such prevention of crime being the object of all punishments. Yet by our Act they are unfortunately so slight as

to operate in its encouragement. With us these long imprisonments have ever been found the worst description of punishment, for it is evident that useful men are thus lost for years or probably for life to the country which requires their services, and the loss of even three or four men by confinement on board will render a small merchant ship incapable of the most ordinary evolutions. Where such pains are taken to form Courts above all suspicion of abuse of power, a more summary mode of proceeding will naturally occur.

The following useful article of the French Code has escaped notice with us; thus it stands in Art. 61. "Every seaman guilty of insult by words, gestures, or threats towards his captain, or an officer of the ship, shall be punished by imprisonment from six days to one year, to which may be added a fine of 16 to 100 francs." From which it appears that the French strike at the root of an evil, seeing that an early check to this sort of conduct will always prevent that contempt for superiors which leads by degrees to the most serious mutinies.

Art. 67 says,—"Every person belonging to the maritime inscription found serving on board of a vessel belonging to a foreign power, if he cannot show a regular permission from a French authority, or prove that his presence on board resulted from a cause of extreme necessity, shall be punished according to the terms of the preceding article." Now we have here a proof of the jealous care with which our neighbours watch the progress of their maritime population, and in direct contrast to our mode of proceeding, for it is not generally known, but such is the fact, that by our laws a British ship may go to sea with an entire crew of foreigners even to officers and men! Certainly if the worst of our enemies had planned a scheme for the downfall of our maritime supremacy, no one could have done it more effectually than those who originated that suicidal measure, and hurried it through Parliament as fast as they could. Happily, however, for England, it does not work in practice, there being too much patriotism in the hearts of the people, and the result is, that there is no great increase yet in the number of foreigners employed in British ships, or, as it may be expressed, ships sailing under the British flag. Foreigners to a certain extent are useful in the merchant service, but should never be allowed to exceed a fifth part of the crew in any of our ships. Danes, Swedes, and Norwegians, are often valuable men in merchant ships, and if properly treated will rarely give the slightest trouble as to strict attention to their duty.

Although our troops have in general been sent off to India in a creditable manner, yet there are cases the circumstances of which it is to be hoped are such as may never again occur of our gallant soldiers being entrusted to the tender care of foreign officers and seamen, cases which are highly illustrative of the law of manning to which we have alluded. Two certain large steamers, we will call them the *Castor* and *Pollux* for brevity's sake, were hired from a Belgian Company for the conveyance of 750 soldiers each to India. The company built these vessels at Greenock, although they are themselves in Belgium, and some say their proper names are the *Austria* and *Princess Char-*

lotte. They are fine iron screw steamers, upwards of 300 feet long, and the vessels good enough except that they might be better adapted for troops than they are, having low bulwarks, and none of those conveniences either for officers or men which the subjects of her Majesty Queen Victoria are accustomed to expect everywhere, nor are they in any way particularly well adapted for the purpose required. The *Castor* duly leaves England with her share, but unluckily in the Bay of Biscay she just comes in for that tremendous gale of the early part of October, by which she is roughly treated. As the gale came on, the difference between English and German sailors became more and more evident,—for the latter had never been in such a vessel before. But still the captain, a Belgian, was a "brick"—a regular good seaman, and did his duty to the utmost of his power, as British seamen are sure to do on these occasions. But having no control over his crew, as English officers would have had, he was sold. There were no storm sails ready, and nothing to keep on her abaft, so that she might have had a chance to bow the sea in safety. Instead of this, all was confusion and fear, these foreign sailors were actually frightened at the storm, terrified when they saw three of the soldiers washed overboard from *forward!* two of whom by the recoil of the sea were thrown back again and recovered. But this accidental drowning of one poor man was enough for the crew of the *Castor*, who fancying she would founder from the sea breaking over her, gave up in despair, and rushed headlong to the rum cask. The spirit room was broken into in the midst of the roar and confusion from winds and sea on deck, while below a motley group were soon rolling drunk about the decks! The scene on board can be imagined, and yet there was no real danger to the ship except from the lubberly neglect and ill conduct of the crew in not keeping her bow to it, but letting her fall off into the trough of the sea. Every seaman knows that the weather roll of a ship in this condition might have been attended with the most fatal results.

In the engine room all were foreigners except two Scotchmen, one of whom was chief engineer. These fellows were for deserting their posts to get drunk with the rest; but the chief engineer produced a loaded revolver, and swore he would shoot the first man who left his station! It was enough happily for all on board; for he thus kept the engines at work so as to keep way on the ship, and the helm being kept down, the best was done that could be for a ship *without a crew!*

But where she was all the time, or where she was drifting to, no one seemed to know. How truly it is said that Providence rules if man misrules, and so it was now. For happily the gale, which had been West, became South-East: indeed, had it kept at West all hands must have been lost on that iron bound coast to leeward! and the fate of the *Castor*, with her cargo of soldiers and drunken sailors would have been sealed. But besides the Belgian captain and his engineer, there was another chief on board, who summoned his authority to rescue the ship from her threatened destruction. The commanding

officer of the troops, as soon as he was made aware of what was going on, secured the spirit room, and placing a guard over it prevented further mischief from that source. Our soldiers, as usual, behaved as well as possible, and did all that soldiers could do under such circumstances, so unfair to either their habits or skill. By their assistance the *Castor* at last found herself at Plymouth, a wretched specimen of the effects of a British built ship, full of British troops, being manned with a crew of foreigners.

In the meanwhile the *Pollux* lay at Southampton in happy ignorance of the disastrous voyage of her sister: but it was not so with the authorities there, for with a due regard to prevent her enduring what her consort had undergone, they took the precaution of adding a few English sailors to her crew, besides *an English Captain to take charge of the navigation of the ship;* an excellent officer, a Captain Somebody, who much distinguished himself in the command of the *Trent* in the Crimean campaign, happened to be without a ship at Southampton; fortunately for them they were able to secure his services, and also those of another officer from one of the mail steamers; but it was supposed the Belgian captain was to remain to share the greater part of the emoluments of office. The *Pollux* has, however, since arrived at Cork under the sole charge of Capt. S., and embarked the Royal Irish, and may be considered as safe a vessel and as likely to reach her destination as any that has yet left our ports.

Pursuing our observations on the *Code Maritime*, we read in Art. 82, that every captain or master who agrees by his own consent to delegate the powers of command, so far as relates to the navigation of the ship, and consents thus to be merely the bearer of despatches, shall be punished by an imprisonmont of from fifteen days to three months, and by a prohibition from command from one to two years. In case of repetition, the prohibition from command to be final.

We have no law to meet this case in our merchant service; but it was a very common practice in former times for owners to appoint their sons or nephews to a command, while very young, for the purpose of giving them a position in life, and thus to raise them to a position of some sort of importance at the outports, In a case of this kind, an old chief mate would be looked out to take care of the ship for him. But the practice, however, is now entirely abandoned, having been put down by Art. 131 of our Merchant Shipping Act, which requires certain examinations, the forms of which are such, that an officer can scarcely get through the grades for a command till he is twenty-four years of age, and after such service as would make him fully competent to take charge himself. The country is indebted for this part of the Act to Rear-Admi. Fitzroy, who, as Capt. Robert Fitzroy, M.P., met with much difficulty in urging this measure before Parliament.

Art. 89 says, that every individual inscribed in the list of the ship's company who with a criminal intention founders, loses, or destroys, by any means whatsoever, the ship in which he is embarked, shall be

punished with ten to twenty years' hard labour. If the culprit has the charge of the navigation of the ship the maximum punishment shall be inflicted. If a homicide or wounds occur by the foundering, loss or destruction of the vessel, the guilty party shall be in the first case punished with death, and in the second punished by hard labour for a term."

The foregoing is a clear and concise definition of the crime of barratry, which, with the exception of mutiny or piracy, is the greatest nautical crime which can be committed in our merchant service. The Art. 239 in our Act scarcely reaches the crime of barratry, and merely considers it a misdemeanour, a fact which leaves the Naval Courts to guess what a misdemeanour is, and how it is to be punished. The insertion of Art. 239 without stating the punishment for the crime, is no guide to Courts that have to do the work independently of any members of the legal profession. The crime of barratry was formerly a capital offence in this country, and the last man who was executed for it was one named Codling, who was hung on Deal beach, about fifty years ago, for scuttling his ship in the Downs for the purpose of defrauding the underwriters. The brokers of this ship were named Blackett.

The following is a definition of the crime of barratry by the late Lord Ellenborough in the case of Earl *versus* Rowcroft. "A fraudulent breach of duty by the master in respect of his owners, or, in other words, a breach of duty in respect of his owners with a criminal intention or *ex maleficio*, is barratry."

Burning, casting away, sinking, and destroying ships in England, punishment of, 43rd George III., 113; repealed by 7th and 8th George IV., cap. 27, 9 and 11; other provisions, 7th and 8th George IV., 30, 9 and 11; 7th William IV., and 1st Victoria, 89.

The crime of barratry is much more common with British ships than is generally supposed; but is confined to a particular class of vessels. In ships of large size or note it would be almost impossible to escape detection. The places where more business in this way has been done than in any other, are probably the North end of the Goodwin Sands and the Bahama Banks in the West Indies. In Archbold's work on the new system of criminal procedure, 1852, we find the following, p. 526, "Setting fire to or destroying a ship, felony; punishment, transportation for life, or not less than fifteen years, or imprisonment (with or without hard labour and solitary confinement for not more than a month at a time or three months in a year) for not more than three years, 1st Victoria, 89. Attempt to commit the offence, same punishment, Victoria 8 and 9, 25.

Again, Art. 90 decrees that every captain, master, or commanding officer, who, with a fraudulent intention, turns to his profit the vessel entrusted to his charge, shall be punished by twenty years' hard labour, without prejudice to the civil action reserved to the owner.

There does not seem to be in our Merchant Shipping Act any article to meet this case; but as that Act repeals no other Acts which previously existed relating to shipping, civil action is the only remedy

for the owner. Such cases, however, are very rare, as few owners entrust the command of their vessels to any but those in whom they can place implicit confidence, and with whom, by the knowledge of their habits aad connections, they know their interests are in safe keeping. The only cases in which owners are often imposed upon, are when they screw down their commanders to an unusually low scale of remuneration. The worst of all policy, let it be either on shore or afloat, is to place persons in responsible situations and to keep them so poor by bad pay as to oblige them to make up the difference by temptation to fraud and deception. Successful companies have ever paid their servants high, who have the charge of enormous capital; and the salaries given to some of those who have the management of large concerns are almost incredible.

But it is a well known principle in human nature, that it is the best policy to make it every one's interest to be honest, and instances are too commen of the fatal effects of obtaining services too cheaply. Everyone should feel his situation as being one of value, or he will be quite indifferent as to losing it, and thus his employers have no hold upon him. A cheap captain is of all others a most dangerous man, as he is not only likely to make up the difference out of the ship in a manner which it is quite impossible to detect, but he is mostly selected from a different class of men altogether from that whence he should come, who are accustomed to different manners and habits, and with a ruinous partiality for grog. There is too much reason for believing that to this cause may be traced many of those dreadful wrecks, accompanied by that wholesale loss of life, that so frequently come before us in the columns of the press.

(To be continued.)

Lighthouses and Lighthouse Boards.—No. II.

The truth of the old adage about shutting the stable door after the steed is stolen has long had its application in maritime as well as other matters. In the subject of lighthouses it flourishes in full vigour, and the question of how many wrecks are required to produce a light might be a matter of interesting speculation. This observation, so amply confirmed in the Lagulhas light, has just received further confirmation at Sydney. The unhappy wreck of the ill-fated *Dunbar*, and her long list of confiding and helpless passengers, supplies painfully confirming testimony of the accuracy of the remark. The people of Sydney, however, have opened their eyes to the evil at last, and their Superintendent of Lights, &c., has sent us the following communication:—

The Port Office, Sydney, New South Wales,
10th October, 1857.

Sir,—I have the honour to forward to you notices of the intended exhibition of a light at Newcastle, on the 1st January next, and of a light on the

Inner South Head of Port Jackson, the time for lighting which has not yet been appointed.

Anxiety to give as early notice as possible to the public respecting these lights, has induced me to publish the enclosed notifications in the present form, but more detailed information will be supplied as early as practicable.

I have, &c.,

ROBT. F. POCKLEY,

Superintendent of Lights, Pilots, and Navigation, N.S.W.

To the Editor of the Nautical Magazine.

Additional Light at the Entrance of Port Jackson.—Notice is hereby given, that, in addition to the revolving light now exhibited on the Outer South Head of the Harbour of Port Jackson, it is the intention of the Government shortly to erect a lighthouse on the Inner South Head, which will be a first-class catoptric light, and exhibit a constant bright light, at an elevation above the level of high water mark of ninety feet.

Notice will be given of the time when this light will be first exhibited, as soon as it has been with certainty decided upon.

New Light at the Port of Newcastle.—Notice is hereby given that, on and after the 1st January, 1858, the coal fire hitherto exhibited on the main land, at the Port of Newcastle, will be discontinued, and that a light from the lighthouse recently erected on Nobby Island will be exhibited.

The light will be a bright white fixed light, and will show from sunset to sunrise.

ROBT. F. POCKLEY, *Superintendent of Lights, &c.*

Sydney, N.S.W., 7th October, 1857.

And we have received the following from the lighthouse authorities at Philadelphia:—

Lighthouses on Florida Reef.

New Lighthouse off Dry Bank.—The new lighthouse near Coffin Patches, off Dry Bank, on Florida Reef, is now approaching completion, and a light will be exhibited therefrom, on or about the 15th of March next (1858). This structure is on Sombrero Shoal, near Sombrero Key. It is an open frame work of iron, built on iron piles. The roof of the keeper's dwelling is 47 feet above the water. From the top of the dwelling, and within the frame work, a cylinder 7 feet in diameter rises to the height of 82 feet. This is surmounted by the watch room and lantern, 12 feet in diameter, and 25 feet high. The whole structure will be 154 feet high, and will be painted red.

The illuminating apparatus will be dioptric, of the first order of Fresnel, showing a fixed white light, and illuminating the entire horizon.

The focal plane will be 141 feet above the mean sea level, and the light should be seen under ordinary circumstances, from the deck of a vessel 15 feet above the water, a distance of 19 nautical miles.

The position of the light as deduced by the Coast Survey is—lat. 24° 37′ 36″ N., long. 81° 6′ 43″ W. of Greenwich.

Change of Carysfort Reef Light from a Fixed to a Revolving Light.—Simultaneously with the first exhibition of the light off Dry Bank, Carysfort Reef light, which is now fixed, will be changed to a revolving light of the first order of Fresnel, showing a bright flash once in every 30 seconds.

Mariners are particularly cautioned not to mistake one of these lights for the other after the exhibition of the new light and the change of the Carysfort light from a fixed to a revolving light.

The height of the focal plane at Carysfort Reef lighthouse is 106 feet above

the mean level of the sea, and should be visible under ordinary circumstances of the atmosphere, from the deck of a vessel 15 feet above the water, about 18 nautical miles.

The approximate position is—lat. 25° 13′ 15″ N., long. 80° 12′ 44″ W. of Greenwich.

Due public notice will be given in advance of the exact time of the proposed changes.

By order of the Lighthouse Board,

W. F. RAYNOLDS, *Capt. Corps Top. Engineers.*

Philadelphia, Pa., October, 19th, 1857.

We are at any rate glad to see the steps taken in reference to the Sydney light, which had they been so long ago there is too much reason to believe the *Dunbar* would have been saved. At the same time, in our opinion the Outer North Head would have been a more desirable position for the light: first, because it would have been visible to vessels from sea, both to the northward and southward, through a greater range of the horizon in that position than on the Inner South Head; for this is concealed by the Outer North Head itself from vessels to the northward of N. 51° E. from it, while from those South of it it is concealed by the Outer South Head when they are inshore of the bearing of S. 31° E. from it, so that to all vessels outside on the coast westward of those bearings it will therefore be useless. But *on* the Outer North Head, which seems to be the most salient point of the coast, it would be visible everywhere along it by vessels either North or South of the entrance. In other words, it would be visible through only 95° of the horizon if on the Inner South Head, while it would be visible through 180° if on the Outer North Head. Moreover, the Outer North Head is a bold headland, which a vessel may approach in safety, while the Inner South Head is not so; and if the light-vessel in the West channel were placed on the three feet shoal in the Eastern one, vessels near the Outer North Head would see that light, and might run for it, passing it on either side, for their anchorage. This, in our opinion, would be the proper mode of lighting the entrance to Port Jackson and rendering the new light what it should be—a first-rate efficient sea light. For, as the Inner South Head, on which it is to be placed, recedes above a mile from seaward, that advance in position is lost, besides its advantage to vessels North and South being cut off, as abovementioned. In fact, if the new light be really placed on the Inner South Head, as expressed in the advertisement, ***half its utility will be lost.*** It will only light half the horizon of the coast about Sydney instead of the whole of it, owing to its retired position. Still better late than never means well, and though, like the Spanish proverb, it comes late in the day and with only half its effect, we are glad to see the Sydney people in earnest on the subject.

Some gleams of information have been thrown on the subject of Godrevy light, to which we alluded in our last number, and more than these seems likely to be forthcoming. However the latter may confirm the justness of our observations, sufficient has been afforded by the former to warrant the painful conclusion that an unworthy

economy lies at the bottom of that subject, since it has been broadly stated that the cost of the lighthouse on Godrevy Island would be £8,000, while that which was advocated would be £50,000. No one will dissent from the doctrine that a *wise* economy in these matters is always to be encouraged. But probably there is no branch of our public expenditure to which the application of that principle requires the guide of wisdom more than in maritime affairs; and more especially in its application to lighthouses, because these concern not only the safety of life and property, but implicate the very essence of a maritime state—its ships and seamen. There is no evading the fact that a system of erecting lighthouses in erroneous positions for the mere sake of economy, because the proper one would cost ten times or a hundred times as much, betrays a principle which aims at the destruction of the maritime power of that State which permits it. In fact, lighthouse expenditure resolves itself into one of these alternatives;—which would be the proper course: to place a large sum of money even on a rock at once, and know that it is all sufficient for the intended purpose and that no more will be required through all time, or to take a moiety of it and place that where it cannot effect the intended purpose, and to see the rest of it gradually find its way to the bottom of the sea year after year, with no prospect of a cessation, that more and more will be required in perpetuity;—a sacrifice to which the very moiety that was applied for the prevention of the evil only tends to make more certain. Such is the result, with all its fatal destruction of life, that would surely follow an economy in the erection of lighthouses, unless that economy is *guided* by the wisdom of experience. Happily, the shores of this country do not betray such fatal measures. Those who have been hitherto charged with the very responsible duty of locating our lighthouses have not placed those beacons *behind* shoals; and they moreover knew the dangerous consequences above referred to, and that although a larger sum of money might be necessary to obtain the efficient beacon for the mariner, *whose life depends on it*, that money was circulated in a good work, and promoted that healthy active employment of capital which it is the glory of true political economy to uphold; while the alternative, being a penurious inefficient application of it, is attended with all its fatal results of wreck and ruin.

Now, in respect of that dangerous shoal off St. Ives, we consider that if the lighthouse funds could not afford to place a light upon it, it should have been left for a more favourable season. The let alone process would have been preferable to the suicidal one of choosing Godrevy Island, which will assuredly increase the number of wrecks on the Stones should it ever be completed,—and we therefore denounce it as a trap, at once unseamanlike and a specimen of false economy.

But there is yet a course of proceeding open by which this even may be avoided, and the dangerous Stones as effectually guarded as if a light were placed upon them. The experience of Captain Sheringham, whose surveys of this coast have just contributed a shoal of

considerable importance to the navigation of the North coast of Cornwall, has enabled him to suggest the following judicious means by which the desired object of securing vessels from the Stones may be completely effected, and it is with pleasure we annex his letter. Why a lighthouse should not stand on the Island Point North of St. Ives, even in the middle of a battery, it is not for us to explain. However, Captain Sheringham says:—

London, 2nd December, 1857.

Dear Sir,—Your observations on the proposed light on Godrevy Head as a guide for clearing the Stones are in my opinion judicious. A long acquaintance with that dangerous part of our coasts may entitle me to offer my opinion on the best means under circumstances for keeping vessels clear of the Stones.

From the circumstance of Godrevy Head and this danger being on a particular bearing in the same line, a light placed on the former would be useless as a guide to avoid the latter, except by that bearing, at all times the least satisfactory mode of using one. This is quite irrespective of the monstrous folly of placing a light something near two miles inside a danger as a means to avoid it!

Those who know the coast are aware that the class of vessels that would mostly use this light are coasters or small steamers, where there are but few hands to spare for the purpose of watching the bearing of a light. The man at the helm, being frequently the only one on deck, has something else to do and think of than dropping the helm to lay his hand over an inconveniently placed binnacle compass of very doubtful character in a dark night to see whether, *by a bearing*, he is clear of the Stones.

No, Sir, any practical man will tell you that the first and great object to be kept in view by those who select sites for "danger" lights is that these lights, with no possibility of any mistake, should do their own work. If, therefore, it is ruled that the light in question shall not be placed on or near the shoal, as in the case of the Longships, in order that a vessel may run fearlessly for the bay, let it be abandoned altogether, as the object in view may be as readily gained by adapting the present light on St. Ives pier for that purpose.

The present light at St. Ives is now only used as a tide light from September to April, according to the Admiralty pamphlet of the *Lights of the British Islands*. Let that light be raised and improved, and let it show all the year round a bright white light outside to clear the Stones, and a red light inside and including them for the service of the harbour. You will observe the pier on which it stands is only three miles from the danger. What more simple and effective means then than this law—"To avoid the Stones keep the white light in sight."

I am, &c.,

W. L. Sheringham, *Captain*,
late Admiralty Surveyor.

To the Editor of the Nautical Magazine.

We are therefore quite content to take Captain Sheringham's proposal if, as he says, we are not to have the lighthouse on the Stones, or if we are not to have it in the fort projected on St. Ives Head, and we yet hope to see his proposal adopted.

The Trinity House has given notice that their new light on the Bishop Rock, at the entrance of the Channel, is to be a fixed light, commencing its friendly ray for the security of ships and seamen on the 1st of September next.

Would that we could say as much of the character of those operations in reference to the Rudha Mhail Light in course of construction on the North end of Islay. But there are one or two serious objections which we have yet to notice in reference to that structure It is generally considered that passing from a red light into a white light indicates passing from *danger* into *safety*. Now as the red light of Rudha Mhail will be visible to a vessel outside of Colonsay, (being seen on account of its elevation over the island,) supposing her to pass from the red to the white light with the intention of rounding the South part of Colonsay, her destruction will be certain if she shapes a course then for the South of Islay, for she ought to be two miles to the Southward of that line to avoid the dangerous rocks off the S.W. of Colonsay, left to the Southward of N. 48° W. from the lighthouse. The adoption of this bearing for the division between the red and white light seems most unaccountable, intersecting as it does so dangerous a part of the island, and including the dangers themselves within the range of the white light, always considered the area of safe navigation. It is stated that even the contractor for this structure, from his own observation as well as that information obtained from seamen who have *local* knowledge on the subject, and who take shelter in the Sound of Islay, that he considered that he was doing wrong in erecting it, and that an old commander with a life-time of experience on the coast, told this poor man on his death-bed that he was building the lighthouse in the wrong place, as it ought to have been without the Sound, and not on Rudha Mhail. Whether the wisdom of experience or the wisdom of opinion is best, seems likely to be put to the test at the expence of the seaman.

Loss of the Steamer "Central America."—*Reported by Lieut. Maury to the Secretary of the U.S. Navy.*

Observatory, Washington, Oct. 19th, 1857.

On the 12th day of September last, at sea, the United States mail steamship *Central America*, with the California mails, most of the passengers and crew, and a large amount of treasure on board, foundered in a gale of wind.

The law requires the vessels of this line to be commanded by officers

of the Navy, and Commander William Lewis Herndon had this one. He went down with his ship, leaving a glowing example of devotion to duty, Christian conduct, and true heroism.

All hopes of his having been picked up by some passing vessel have vanished. The survivors of the wreck have made their statements of the gale, the sinking of the ship, and their rescue. These have gone the round of the newspaper press, and we are probably possessed of all the particulars concerning that awful catastrophe that the public will ever know.

The Department has already been officially informed of this wreck and disaster, and of how nobly Herndon stood to his post and gloriously perished; how the women and children were all saved; and how he did all that man could do or officer should do to save his ship and crew also. But the particulars have been given to the Department only in a perishable form of newspaper records.

As a tribute to his memory, as material for history, as an heirloom of the Navy, and a legacy to his country, I desire to place on record in the Department this simple writing and memorial of him.

We were intimates; I have known him from boyhood; he was my kinsman. The ties of consanguinity, as well as our professional avocations, brought us frequently and much together; we were close friends.

Under these circumstances, I ask your leave to file a report of that gale and his loss. I am to embody in it a simple narrative of incidents, derived from statements which the survivors from the wreck have made either publicly, through the prints of the day, or privately to his family and friends. These incidents, in the silent influence of the lessons they teach, constitute an inheritance of rare value to his countrymen; they are the heirloom of which I spoke, and will, I am persuaded, be productive of much good to the service.

The *Central America*, at the time of her loss, was bound from Aspinwall, *viâ* Havana, to New York. She had on board, as nearly as has been ascertained, about two millions in gold, and four hundred and seventy-four passengers, besides a crew, all told, of one hundred and one souls; total, five hundred and seventy-five.

She touched at Havana on the 7th of September last, and put to sea again at nine o'clock on the morning of the 8th. The ship was, apparently, in good order; the time seemed propitious; and all hands were in fine health and spirits, for the prospects of a safe and speedy passage home were very cheering. The breeze was from the trade-wind quarter at N,E.: but at midnight of the 9th it freshened to a gale, which continued to increase till the forenoon of Friday, September 11th, when it blew with great violence from N.N.E.

Up to this time the ship behaved admirably. Nothing had occurred worthy of note, or in any way calculated to excite suspicions of her prowess, until the forenoon of that day, when it was discovered that she had sprung a leak.

The sea was running high; the ship was very much heeled over on the starboard side, and labouring heavily. The leak was so large

that by one p.m. the water had risen high enough to extinguish the fires on one side and stop the engine.

Bailing gangs were set to work, the passengers cheerfully assisting, and all hands were sent over on the windward side to trim ship. Being relieved in a measure, she righted, and the fires were relighted. But there was a very heavy sea on, and in spite of pumps and bailing gangs, with their buckets, whips, and barrels, the water gained upon them until it reached the furnaces and extinguished the fires again, never to be rekindled. This was Friday.

The ship was now at the mercy of the waves, and was wallowing in the trough of the sea like a log. She was a side-wheel steamer, with not a little top-hamper, and therefore an ugly thing to manage in such a situation.

The storm spencer had been blown away, and the fore-yard was sent down during the night. Attempts were made to get the ship before the wind, but no canvas was stout enough to withstand the raging of the storm. After the headsails had been blown away the captain ordered the clews of the foresail to be lashed down to the deck, thinking to hoist the yard up only a little way, show canvas, and get her off; but by the time the yard was well clear of the bulwarks the sail was taken right out of the bolt-ropes, so great was the force of the wind and such the fury of the gale.

The foremast was then cut away; the foreyard was converted into a drag and got overboard; bits of canvas also were spread in the rigging aft, hoping by these expedients, as a last resort, to bring the ship head to wind; but all to no purpose; she refused to come.

Crew and passengers worked manfully, pumping and bailing all Friday afternoon and night; and when day dawned upon them, the violence of the storm was still increasing.

All that energy, professional skill, and seamanship could do to weather the storm and save the ship had been done. The tempest was still raging; resources were exhausted; the working parties were fagged out, and the captain foresaw that his ship must go down.

Still there was some chance for hope; he might save life even if he lost ship, mails, and treasure. He was in a frequented part of the ocean, and a passing vessel might come to the rescue of crew and passengers, if they could but manage to keep the ship afloat until the gale abated. He encouraged them with this hope and asked for a rally. They responded with cheers. The lady passengers also offered to help, and the men went to work with a will, whipping up water by the barrelful, to the steady measure of the sailor's working song.

The flag was hoisted "Union down," that every vessel as she hove in sight might know that they were in distress and wanted help.

Under this rally of crew and passengers they gained on the water for a little while, but they were worn out with the toil of the last night and day; they had not the strength to keep it under.

Finally, about noon of Saturday, the 12th, the gale began to abate and the sky to brighten. A vessel hove in sight, saw the signal of

distress, ran down to the steamer, was hailed, answered, and was asked for help. She could give none, and kept on her course.

At about 2h. p.m. the brig *Mariner*, Capt. Burt, of Boston, bound from the West Indies to New York, heard minute guns and saw the steamer's signals of distress. She ran down to the sinking ship, and, though very much crippled herself by the gale, promised to lay by. She passed under the steamer's stern, spoke, rounded to, and kept her word.

The steamer's boats were ordered to be lowered; the *Mariner* had none that could live in such a sea.

Now came another trying time. The boat scenes of the steamer *Arctic* had made a deep impression upon Herndon's mind; they now crowded into remembrance. Who of this crew should be selected to man his boats? Would they desert him when they got off from the ship? There were some whom he knew would not.

It was not an occasion when the word might be passed for volunteers; for it was the post of safety, not of danger, but nevertheless of great trust, that was to be filled. The captain wanted trusty men that he knew well from long association, and the crew of such vessels is not very permanent as to its *personnel*. Therefore he felt at a loss, for there was still a man wanting for Black's, the boatswain's, boat. A sailor, perceiving the captain's dilemma, stepped up and modestly offered to go. He had not, it may be supposed, been long in the ship, for Herndon evidently did not know him well, and replied, in his mild and gentle way, "I wonder if I can trust you?" The sailor instinctively understood this call for a shibboleth, and simply said, "I have hands that are hard to row, and a heart that's soft to feel." This was enough; he went, and was true. Not a boat deserted that ship.

All the women and children were first sent to the brig, and every one arrived there in safety. Each boat made two loads to the brig, carrying in all one hundred persons.

By this time night was setting in. The brig had drifted to leeward several miles away from the steamer, and was so crippled that she could not beat up to her again.

Black's (the boatswain's) boat alone returned the second time. Her gallant crew had been buffeting with the storm for two days and a night without rest, and with little or no food. The boat itself had been badly stove while alongside with the last load of passengers. She was so much knocked to pieces as to be really unserviceable; nor could she have held another person. Still those brave seamen, true to the trust reposed in them by their captain, did not hesitate to leave the brig in her again and pull back through the dark for miles across an angry sea, that they might join him in his sinking ship and take their chances with the rest.

Let no one call this rash, idle, or vain; it was conduct the most loyal, noble, and true. The names of this brave crew have not been given, else I should suggest the propriety of making some formal acknowledgment of the high appreciation in which such devotion to duty and such conduct are held by the Department.

I am aware that these men do not belong to the Navy, but they are American seamen, nobly doing their duty under the American flag, and adding lustre to it by their deeds. Whether of the naval or of the merchant service, such conduct should not go unrequited by the Government.

During the lowering of the boats and the embarkation of the women and children there was as much discipline preserved among the crew of that ship, and as much order observed among her passengers, as was ever witnessed on board the best regulated man-of-war.

The law requires every commander in the Navy to show in himself a good example of virtue and patriotism; and never was example more nobly set or beautifully followed. Captain Herndon, by those noble traits which have so endeared his memory to the hearts of his countrymen, had won the respect and admiration of the crew and passengers of that ship in such a degree as to acquire an influence over them that was marvellous in its effects. The women felt its force. Calm and resolute themselves, they encouraged and cheered the men at the pumps and in the gangways; and, finally, to Herndon's last appeal for one more effort, they rose superior to their sex, and proposed to go on deck themselves and with fair hands and feeble arms there do man's work in battling with the tempest.

There were many touching incidents of the most heroic personal devotion to duty and to him during that dreadful storm. Even after the ship had gone down, and her passengers were left in the water clinging by whatever they could lay hands on, offices of knightly courtesy were passed among them.

As one of the last boats was about to leave the ship, her commander gave his watch to a passenger, with a request that it might be delivered to his wife. He wished to charge him with a message for her also, but his utterance was choked. "Tell her ——" Unable to proceed, he bent down his head and buried his face in his hands for a moment, as if in prayer, for he was a devout man and true Christian.

In that moment, brief as it was, he endured the great agony. But it was over now. His crowding thoughts no doubt had been of friends and home; its desolation; a beloved wife and lovely daughter dependent alone for support upon him. God and his country would care for them now. Honour and duty required him to stick to his ship, and he saw that she must go down.

Calm and collected, he rose up from that short but mighty struggle with renewed vigour, and went with encouraging looks about the duties of the ship as before. He ordered the hurricane deck to be cut away and rafts to be made. The life-preservers were also brought up and distributed to all who would wear them. Night was setting in, and he directed Frazer, the second officer, to take charge of the arm-chest and send up a rocket every half hour.

Van Renssalear, his first officer, was also by him. Herndon has spoken of him to me in terms of esteem and admiration, and Van Renssalaer proved himself worthy to the last of such commendations.

Side by side these two stood at their post, and perished together with their harness on.

After the boat which bore Mr. Payne, to whom Herndon entrusted his watch, had shoved off, the captain went to his state-room and put on his uniform. The gold band around his cap was concealed by the oil-silk covering which he usually wore over it. He took the covering off and threw it on his cabin floor; then walking out he took his stand on the wheel-house, holding on to the iron railing with his left hand. A rocket was set off; the ship fetched her last lurch, and as she went down he uncovered.

A cry arose from the sea, but not from his lips. The waves had closed about him, and the curtain of the night was drawn over one of the most sublime moral spectacles that the sea ever saw.

Just before the steamer went down a row-boat was heard approaching. Herndon hailed her. It was the boatswain's boat, rowed by "hard hands and a gentle heart," returning on board from the brig to report her disabled condition. If she came alongside she would be engulfed with the sinking ship. Herndon ordered her to keep off. She did so, and was saved. This, so far as I have been able to learn, was his last order. Forgetful of self, mindful of others, his life was beautiful to the last; and in his death he has added a new glory to the annals of the sea.

Forty-nine of the passengers and crew were picked up, floating on the water, that night and the next morning, by the Norwegian barque *Ellen*, Capt. Johnson, and brought safely into Norfolk on the ninth day after the wreck; the English brig *Mary* picked up three others, who had drifted about 450 miles with the Gulf Stream. Total saved 152.

The *Central America* sunk about 8h. p.m. of September 12th, 1857, near the outer edge of the Gulf Stream, and the parallel of 31° 45′ N.

It does not appear certain that her commander was seen or heard, after she went down, by any of those who survived the wreck. Mr. Childs, one of the passengers, thinks he conversed with him in the water after midnight on Saturday, only a little while before he himself was picked up. But Herndon was small of stature, of delicate frame and constitution, and by no means in robust health. He was already suffering from the incessant labour and exposure of the last two days and that long Friday night. His fatigue must have been great, and when the waves closed over his ship, he was, in all probability too much exhausted to struggle with the rest in that pool of drowning men for floats and life.

Everything that could be done by the best sea-captain to save his ship was done to save this one. Brave hearts, and strong arms, and willing minds were on board. There was no lack of skill or of courage. Order and discipline were preserved to the last; and she went down under conduct that fills the heart with sentiments of unutterable admiration.

Herndon was in the forty-fourth year of his age. He was born in

Fredericksburg, Virginia. on th 25th day of October, 1813. He was the son of the late Dabney Herndon, of that place, and was the fifth of seven children, five sons and two daughters, of whom Mrs. Maury is the elder. He was named after Capt. William Lewis, of the Navy, who was lost at sea on board the U.S. brig *Epervier*. Lewis Herndon was left early an orphan; and entered the Navy at the age of fifteen. Affectionate in disposition, soft and gentle in his manners, he was beloved of his own; he also won the love and esteem of his associates wherever he went, and he became a favourite throughout the service.

None knew him better, or loved him more than,

Respectfully, your obedient servant,

M. F. MAURY, *Lieut. U.S.N.*

Hon. Isaac Toucey, Secretary of the Navy, Washington.

Nine Days at Sea without Food.

Three more persons have been added to the list of survivors from the wreck of the *Central America*. They were found drifting in one of the steamer's life-boats, some 478 miles N.E. of the spot where the *Central America* went down, and nine days after that sad affair the brig *Mary* picked them up, on her voyage from Cardenas (Cuba) to Cork, Ireland. The *Mary* carried them eastward seven days, when she met the Bremen barque *Laura*, going from Bremen to New York, and transferred them to her. When landed there, they looked almost like skeletons, gaunt, sick, exhausted, and covered with boils. Their names are, J. Tice, second engineer of the *Central America*; Alexander Grant, fireman, and G. W. Dawson, (coloured,) passenger.

A New York paper says:—"Tice stayed by the steamer till the moment she sank, when, with a plank that he had before provided, he plunged into the sea. He was drawn down in the whirl, but, in coming to the surface again, brought his plank with him. To this alone he clung for three days, seeing no sail, nor any of his late shipmates. On the fourth morning he drifted past an empty boat, for which, deserting his plank, he swam, and, after a tedious pull, got into it. On the fifth day he drifted close past the steamer's hurricane deck, simply an inch-board platform, covered with oiled canvas. Mr. Grant, one of the steamer's firemen, who was on this hurricane deck, jumped off, swam to Tice's boat, and the two rowed her up (for, happily, the oars had not been lost out) to the hurricane deck, and took off Dawson, the only living tenant it then had. The three drifted four nights and three days longer, North and Eastward, up to the very eastern edge of the Gulf Stream, and out of the usual track of all vessels. Tice had nothing to eat nor to drink from the hour the steamer sank until the fifth day! when he struck a dogfish with the blade of his oar and killed it. This wretched provender they ate ravenously of, raw, of course, and then, till the ninth day, they had no more to eat. On the eighth night there was a heavy rain. Of

the water that fell they drank freely, and would have killed themselves with it, Grant said, but that they had been able to save only a little of it, and the supply soon failed. Whether it is true that the two who were saved on the hurricane deck had nothing to eat is not known. They say they had not; if they had, it must have been that they fed on human flesh. But this Grant stoutly denies, while Dawson stubbornly refused to say 'Yes,' or 'No,' when his friend, as delicately as a bluff old sailor could, asked him the question. The two who were saved on the hurricane deck suffered less during the first four days than the engineer. Grant says, that when he found himself overboard, still clinging to the piece of wreck that he held by when it parted from the steamer, there were nine others on it, six of them the steamer's passengers. They saw no sail, nor could tell that any survived but themselves. On the second day Dawson, the coloured man, drifted to them on a plank. He attempted to get on the hurricane deck, but they remonstrated, as the weight of those already on it sank it so low that the sea washed clean over it at every wave. He would not part company with them, however, but clung fast to a side, waiting until, as one after another of them dying, fell off, it lifted to the surface, and Grant was glad to have his company. As we have already said, Mr. Tice picked them up on the fifth day. Though these three men are in the city, and we have conversed with them all, it is little that can be got out of either of them, or that they have yet told anybody."

Dawson stated that he clung to a plank when the vessel foundered. "He continued on this plank for two days, when he drifted near the hurricane deck, on which there were twelve other persons. Their weight kept it sunk nearly two feet under water, and it was not until after a portion of those had died and dropped off that he ventured on to it. During this interval he supported himself by holding on to the edge of the raft, as it was evident that he could not place his whole weight upon it without endangering the others. One by one, however, they became exhausted and died, when their bodies were either washed off or thrown over by the survivors; this so far lightened the deck that he climbed upon it with the rest; some became delirious, and, yielding to the cravings of thirst, drank the salt water, which only aggravated their sufferings, and they soon died. Sharks and dogfish cruised about in sight of them, and sometimes came very near, as if impatient of their prey. On the fifth day only four of the men remained alive on the hurricane-deck, when they discovered Mr. Tice, the assistant-engineer, in a boat at a short distance. Grant swam to the boat, and the other two followed him, but the last two were drowned. On the fourth night, a coloured man, named Gilbert, began to grow despondent, and the feeling soon increased to such an extent that he became deranged. Mr. Buddington, also, was similarly affected. They would talk wildly about going down into the mess-room or the pantry to get some water or food. Gilbert insisted that the steward had told him he should have some water if he came down. Some of them, Mr. Dawson thinks, drank salt water in

their desperate thirst. Some he stopped while they were in the act. During Wednesday several died—some by lying down in the water and drowning, and others by falling off into the sea. On Wednesday evening, Buddington and Gilbert's mental derangement became uncontrollable, and though Grant and Dawson did all they could to soothe them, their efforts were ineffectual, and soon after dark they swam from the raft, fancying in their frenzy, that they were soon to obtain relief. It was the relief of death."

Grant states that twelve persons got on to the floating hurricane-deck, which was two feet under water. "On the third night all were nearly wild from hunger and thirst. Some gazed with vacant stare out upon the broad waters in search of a friendly sail, and discerning none, hope forsook them, and they died. Others raised their enfeebled hands imploring God to save them from impending death, and while thus they prayed, the remorseless waves choked up their utterance, and buried them for ever. The fourth day came, and all but four had perished. The sufferings of those who remained were even now beyond description. Death appeared a cheap price for relief, and yet they clung to the wreck, and looked out for a sail until their eyes were deadened by the glare of the waters. But long and anxiously though they looked, no sail appeared. Another terrible night was passed, and as the morning of the fifth day dawned the four men were still clinging to the floating deck—two of them, however, so feebly, that it was evident they must soon die, if not very soon relieved. It was not long now before Grant discovered Tice, an assistant-engineer, in a small boat, a short distance from the floating-deck. He dropped into the water, swam towards the boat, reached it, and was taken in. Tice and Grant then made for the deck to take the others off, but when they arrived Dawson alone remained. The other two had died and been washed away."

The Late Rear-Admiral Sir Francis Beaufort, K.C.B., F.R.S., F.R.A.S., F.R.G.S., *Instit. Sc. Paris Corresp., and Member of the American Philosophical Society at Philadelphia.*

The hand of the Destroyer, ever busy among us, now here and now there, has fallen on one who has served his country well both abroad and at home. Rear-Admiral Sir Francis Beaufort died at Brighton on the 16th of December, rich in honours and ripe in years. It is usual for this journal to leave the biographical memoirs of naval officers to other pages, yet there are exceptions, arising from station, when this rule is to be forgotten. A long intercourse of years in the same line of duty as that of the departed Admiral will justify that course now; besides which the *Nautical Magazine* has lost a staunch

friend! and to the several points of general professional excellence of that friend, and the many good qualities of his mind, this work should bear record. There are many who will dwell in admiration of his character on account of the last, and there are many, too, who would rather point to the first in their admiration of the man.

It is stated that Rear-Admiral Sir Francis Beaufort was the son of the late Rev. Daniel Augustus Beaufort, D.D., Rector of Navan, Meath, and Vicar of Collon, Louth. He entered the Navy June 21st, 1787, as a volunteer on board the *Colossus*, 74, Captain H. C. Christian, stationed in the Channel, having previously gone a voyage to the East Indies under Captain Lestock Wilson, a name well known as having contributed in a hydrographical way to the benefit of navigation. He became Midshipman, in June, 1790, of the *Latona*, 38, Captain A. Bertie, and next served for three years in the *Aquilon*, 32, Captain Hon. R. Stopford, one of Lord Howe's repeaters in the action of June 1st, 1794; and while attached to the *Phœton*, 38, commanded in succession by the latter officer and Captain J. N. Morris, was present in Cornwallis's celebrated retreat, June 17th, 1795, of which he always spoke in terms of the highest admiration, considering the tact and management displayed on that occasion as far more worthy of the medal reward than some which had obtained it. After this he assisted, in the course of the same year, in driving on shore on the Isle de Ré and destroying a vessel, name unknown, of 28 guns; took part in the capture, March 10th, 1796, of *La Bonne Citoyen*, 20 guns; fought in a partial action, March 23rd, 1798, with the French 36-gun frigate *La Charente;* was instrumental, September 8th following, to the capture of *La Flore*, 36; and witnessed the taking on various occasions of nine privateers and other armed vessels.

On October 28th, 1800, while First-Lieutenant of the *Phaeton*, he performed an exploit of great spirit and gallantry in boarding, with the barge and two cutters under his orders, and capturing, after an obstinate resistance, the Spanish polacca-rigged ship *San Josef*, carrying 14 brass guns, 34 seamen, and 22 soldiers, moored under the protection of 5 guns on the fortress of Fuengarola, near Malaga, and flanked by a French privateer. For his determined bravery in this affair, in which the enemy had 19 men wounded, and the British 1 man killed and 4 wounded, he, who, forming one of the latter, had received a wound in the head and several slugs through his left arm and body, was, on the 13th of the following month, deservedly rewarded with a Commander's commission, and for his severe sufferings was awarded a pension of £45 12*s.* 6*d.*

From November, 1803, until June, 1804, we find him gratuitously devoting his time to the formation of a line of telegraphs from Dublin to Galway. On June 5th, 1805, he obtained command of the *Woolwich*, 44, *armée en flûte;* in which ship he first proceeded to the East Indies, then to the Rio de la Plata, and in 1807 made a survey of the Harbour of Monte Video, which was used by H.M. ships until

recently, when it was replaced by the more extended one of Mr. Dillon. From thence he went to the Cape of Good Hope and the Mediterranean.

His next appointments were:—May 23rd, 1809, to *Blossom* sloop, employed on the coast of Spain and at Quebec, and in annoying various fleets of merchantmen; and May 30th, 1810, he was promoted to post rank, to the *Fredericksteín* frigate. Captain Beaufort did not, however, join this ship until December 12th following, being in the interval employed in protecting the outward-bound trade to Portugal, Cadiz, and Gibraltar, in accompanying two Spanish line-of-battle ships from the latter place to Minorca, and in discharging the duties from September 27th to October 21st of Acting-Captain of the *Ville de Paris*, 110.

During the two following years he was actively engaged in a survey of the coast of Karamania, in Asia Minor, an employment he was obliged to relinquish in consequence of a nearly fatal gunshot wound he received from the hands of a fanatical Turk, June 20th, 1812, but not before he had secured sufficient data to construct his well known charts of Karamania. The survey of this coast was made under circumstances which signalize it as a work of patriotism above all others of its kind. He was directed to make this survey, but he himself was left to provide the means, which it is pretty well known must be expensive, as instruments always are. He made it, having previously provided himself with them and books for its history. The charts were published by the Admiralty and his book by a publisher. The excellence of both is well known. Captain Beaufort, who had previously contributed to the extirpation of a band of pirates from the southern part of the Morea, then returned home with convoy, and on the 29th October in the same year his ship was paid off.

For several years after his arrival in England he appears to have been fully occupied in laying down the results of his labours, and in constructing a variety of charts, of which it is said there were one of the Archipelago, three of the Black Sea, &c., including the coast of Africa, and seven of Karamania. The last of these however we have only seen.

It was when Sir Edward Parry accepted a foreign appointment in May, 1829, that the office which he then held of Hydrographer to the Admiralty was offered by Lord Melville to Captain Beaufort; and by those who knew him it might be well doubted if any officer throughout the ranks of the Navy could have been found better qualified than he was, from his habits, his attainments, and his tact, for conducting the important duties of that station.

At this period, although from the then recent contributions by Captain Smyth from the Mediterranean, Captain King from Australia, Captain Owen from Africa, and Commander Bayfield from Canada, hydrography had derived some considerable and important additions, its progress was yet feeble, and it had not yet attained that vigorous condition which it was destined to assume under the able management of the new Hydrographer. But on the accession to

office of Captain Beaufort the star of hydrography may be said to have soon become in the ascendant.

Soon afterwards the Geographical Society was formed and the twin sciences of geography and hydrography received at his hands every possible encouragement which his station could give them, presiding as he did over one and assisting at the councils of the other. When we point to the St. Lawrence, to the West Indies, to the Mediterranean, to either shores of South America in the Atlantic or Pacific, even to the western shores of North America, besides the coasts of Australia, and consider the state of the catalogue of charts published by his office in those early days, it is impossible not to be struck with the rich acquisition which hydrography has made under his care. The surveys of our own shores, scarcely completed even now, were also taken in hand everywhere, and gradually and surely, although slowly, were carried forward in a manner previously unknown. It is when charts are wanted that they are expected to be ready, and no allowance is then made for circumstances adverse to their construction. Foreseeing this real requirement of the State, in a great measure this want was provided against by the late Hydrographer, and the names of King, Owen, Fitzroy, Vidal, Bayfield, Belcher, Barnett, Graves, Shortland, and Bate abroad, and many more, too numerous to mention, headed by the unfortunate Hewett, at home, attest how vigorously the cause of maritime surveying was pushed on by the late Hydrographer.

That the great addition thus made to the stores of hydrography by all these officers under his guidance was of considerable importance also to our merchant shipping, was proved by the circulation of the charts constructed by him and the extraordinary amount to which the sale of them to the public attained. In fact, hydrography was yet in its youthful day when the science became his care, and the patronage which it derived from Government under his management seemed only to be limited by the number of officers who could be found capable of carrying it forward. Much, indeed, had to be done, and much was done and well done, but there yet remain many highways and byeways where much is yet not done.

When steam was becoming common to our shores, and its progress at sea gradually introduced the present system of mail steamers; and when the railway reached our coasts and invaded the strands of our harbours and the banks of our rivers, traversing these and encouraging as well as interfering with the construction of those,—then was there additional duty required from the judgment and decision of the Hydrographer. The sea passages of the former and the proper and wholesome control of the latter by upholding the rights of the subject and preventing the monopoly of companies, involving intricate questions of civil engineering, claimed no small share of the Hydrographer's attention. The first pressure of these was the severest and most trying: as that went off the duties lessened, but then it was that the Admiralty derived all the advantages from the great powers of mind and the clear judgment of the Hydrographer. But, sufficient

as was that master mind of his to cope with the heaviest of those questions which came before him, it was evidently at the expense of his legitimate occupation in hydrography,—the interests of the country demanded immediate attention in these important subjects, but that was rendered at the expense of that attention which was also necessary to charts for her seamen.

Were we to quote an instance of the nature of that attention necessary for the due exercise by the Hydrographer of that control over engineering subjects with which the Admiralty is invested, we might point to the Menai bridge; the construction of which was determined by its architect in compliance with the conditions required by the Admiralty that in all its parts, the lowest surface of it should be one hundred feet above the level of high water. And thus was the free passage of the Menai Strait secured for passing vessels and the navigation continued uninterrupted, while the channel is spanned by the most remarkable bridge in the world. The importance of such subjects led to the formation of a special branch of the Hydrographic Office, to which an officer was soon after appointed under the Hydrographer.

In the midst of these important duties which employed his time with so much advantage to his country, the late Hydrographer succeeded to his rank of retired Rear-Admiral, and afterwards, in 1848, was rewarded with the civil order of Knight Commander of the Bath. But it was not very long after this that it became evident that he had done his work, and in 1854 he was permitted to retire at his own request.

In the foregoing it has been shown that the public services of Sir Francis Beaufort were more than of an ordinary kind. Enough they were, indeed, to entitle him to the gratitude of his country. His private worth will no doubt be recorded by another hand. In the course of those services it may be admitted that certain traits of character that it could have been wished were otherwise became too apparent to those who were assisting him in his labours. But which among us is perfect? Let them remain concealed by their own insignificance, although it might be desirable that the accents of approval could fall spontaneously from every tongue. Again, where is the man who has never lent a willing ear to the smooth words of flattery? or in this aristocratic land of ours who is he, we may ask, that is not sometimes a courtier?

Still, was the opinion of the late Admiral required on shore, in the duties of his office or in the council chamber among those Committees* in which he frequently took his share, whose was more sound than his? Do we see him afloat in the scientific duties of his active profession, that opinion was generally founded on clear and comprehensive views of the subject before him; and, whether on shore or afloat, his judgment therein was generally right. Again, whenever this was

* Those on the reconstruction of the *Nautical Almanac*, the Tonnage Committee of 1834, and the several Arctic Committees are instances.

given in writing, it was expressed in terms which were at once clear, concise and correct, for his composition was remarkable for elegance and perspicuity,—desirable qualities, indeed, in any one, but more especially one in his position.

In fact, the words of Sir Francis Beaufort were few, but they were well chosen and were as straight to the purpose as his charitable deeds were manifold and well directed! Let, then, his failings, if he had them, be written in sand; and let those numerous good deeds which he has left engraved on many a grateful heart be perpetuated in characters of brass, that these may remain to preserve his good fame when those have passed away.

The last duties were paid to the remains of the departed Admiral on Tuesday the 22nd of December, when they were deposited in the family vault at Hackney, being attended by the members of his family and a few of his relatives and friends.

NAUTICAL NOTICES.

PARTICULARS OF LIGHTS RECENTLY ESTABLISHED.

(Continued from vol. xxvi., p. 673.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist. seen Mls.	Remarks, &c. [Bearings Magnetic.]
47. Leghorn.	1. On southern head	Coast of Italy	F.			Est. 1st Dec. '57. Red Light, 440 yards N. 83° W. from Leghorn Light.
	2. Northern extreme		F.			Green Light, 480 yards N. 53½° W. from Leghorn Mole Head.
	3. Outer extreme of pier in progress on North side of port.		F.			Natural colour. Observe that while the works are in progress should these not be shown from stress of weather a light will be seen at the Mole Head.
48. North Unst	Muckle Flugga Holm	Shetland, 60° 51′ N., 0° 53′ W.	F.	230	21	Est. 1st Jan. '58. Visible from all parts of the horizon except S.E. of the Scaw, where the high land of Unst conceals it. When seen bearing between N.N.W.¼W. and N.W.b.W.¼W. it will appear Red. The present temporary light to be discontinued when this is lighted.
49. Hogsten Point	Godo Island in Bred Sound	Norway, 68° 28′ N., 6° 1′ E.	Ff.	39	13	Est. 25th Nov, '57. Flash every 3 minutes. Ceases between 10th May and 1st of August: burns during the other months.
50. Sydney	Proposed on the Inner South Head	Port Jackson Australia	F.	90	14	Intended.
Nobby Head	On port hand of entrance	Newcastle, 32°55·3′N., 151° 48·8′ E.	F.			Est. 1st Jan., '58. Coal fire hitherto shown on mainland to be discontinued at same time.

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

Notice to Ships Bound to Manila.

1.—All ships drawing more than 8 feet, coming into the river, should obtain a pilot from the Captain of the Port.

2.—Ships from sea requiring a pilot should hoist their ensign at the mizen, that he may come out early and according to the water which the ship draws and the time of day may anchor her in the bay or take her into the river.

3.—A yellow flag hoisted by the Captain of the Port indicates that no pilot can go on board and that ships cannot enter; so that ships seeing this signal on coming from sea should drop their anchor in the bay, or at Cavita, as most convenient to them.

4.—Ships drawing less than 8 feet can enter and leave the river without a pilot according to its present condition.

5.—Every captain whose ship draws more than 8 feet, and who disregards this notice, will forfeit a sum equivalent to the payment of a pilot and the expences of enforcing it.

6.—The pilot will be responsible for any damage which he may occasion to the ship, according to the prescribed laws on that subject.

In order to carry into effect the order of the 21st of this month on the subject of pilots taking ships into or out of Manila, on the notice of the Captain of the Port, it has been decided that—

Ships drawing 9 feet of water may enter the river without a pilot during the S.W. monsoon, and those drawing 10½ during the N.E. monsoon.

The depth of water on the bar at low water will be made known every day by the Captain of the Port in Spanish feet, and English feet and metres: Also the approximate time of high and low water along with the notice of neaps or springs according to the state of the tides.

Manila, 31st August, 1857. Domingo de Medina.

Moniteur de la Flotte.

Requijada,—Spain.

102, *Minories, London, Nov. 26th*, 1857.

Sir,—The little port of Requijada, on the North coast of Spain, having recently grown into some commercial importance, and several masters of vessels bound to it being put to considerable inconvenience in consequence of their ignorance of its position, we herewith send for insertion in your Magazine some information respecting it, furnished us by M. Ed. De Burgh, the French Vice-Consul at the port.

Yours respectfully,

James Imray and Son.

To the Editor of the Nautical Magazine.

Requijada—is a small village in lat. 43° 18′ N., and long. 3° 55′ W., situate about ten miles up the River Besaya, on its eastern bank, just above where the stream divides into two branches. At the entrance to this river is a small islet named Suances, and further in a village called St. Martin de la Arena, and another Suances, of which the latter is distant about ten miles westward of the port of Santander; hence the port is frequently called Port Suances, or St. Martin de la Arena. Close behind Requijada the high road from Castille (through Torre la Vega) passes to Santander.

The river is not sufficiently deep to permit, even at spring tides, the entrance of vessels drawing more than 12 feet; but these it is said may run in during

those tides with safety. If there should be a great swell on the bar, which is generally occasioned by north-westerly winds, an allowance must be made for the rise and fall of swell. In fine summer weather, vessels drawing 14 and 15 feet water have entered the river safely, but it is more prudent not to attempt to run in with a greater draught than 10 to 12 feet, or you may be neaped at waning moon tides; some vessels have been so neaped up to the full and change of moon. Vessels in ballast of 100 to 140 tons register, can enter with the greatest ease at half or three-quarter tide.

A stranger *must not* attempt to enter the river without having the assistance of a pilot. When making the port from sea, Santander Lighthouse is the object that should be run for, that being the most prominent and conspicuous landmark. Steer then for the large rock at the entrance to the river, called Suances Islet, and in running along the coast you will see about three miles of yellow sand-hills, which are very conspicuous and visible in ordinary weather at the distance of ten or twelve miles. Having cleared Suances Islet, steering to the westward, you will see a sandy bay about two and a quarter miles wide, and should then hoist your pilot-signal, if the wind be such as to allow you to enter, that is, from the N.E., N.W., or North. Signals are made by means of a white flag from a green hillock, close to an old ruined tower on the starboard side of the river. The flag indicates by *dipping* the direction you ought to steer.

Merchants are saved twelve shillings per ton for the land carriage of wheat or goods by sending their vessels to Requijada instead of Santander. The difference of the distance is forty-eight hours by bullock-carts.

To the above may be added the following:—"The river forms a barred harbour, with a flow of tide at springs of about 12 feet and at neaps of 9 feet. It is very narrow, and can be taken only with a leading wind. The swell generally rolls in very heavily with N.W. winds, and with those winds are the best tides. With strong winds from W.N.W. northerly to East the sea rolls in much."

CUMILLAS.—This is a small creek about thirteen miles westward of the River Besaya, or St. Martin de la Arena. It is sufficiently deep to accommodate vessels drawing about 9 feet water, but these will take the ground at low tide. The bottom is rocky and there is no river.

FORMOSA BANKS, CHINA SEA.—There is probably less water on these banks than the charts at present represent, Capt. Livingstone of the *Sea Star*, of Glasgow, having reported to us that he recently struck the ground in lat. 23° 19′ N., and long. 118° 53′ E., and carried away part of his keel. The depth he considered to be about 15 feet, and High Island bore to the E. ¼ S. about twenty miles.

THE PRATAS.—Another wreck is thus reported by the *China Mail* on this shoal:—"We have this week to record the total loss on the Prata Shoals of the British ship *Carthage*, Capt. Thompson, of 450 tons burthen. She left this port on the 13th of October, with several boxes of treasure and a few chests of opium. According to the captain's reckoning, the ship was forty miles to windward of the shoal; but the current had set him down that distance in a few hours, and the ship struck about one o'clock in the morning of the 17th inst. The boats, two in number. were immediately hoisted out and some treasure put into them. Capt. Thompson then shaped his course in the boats for Hongkong, where he arrived on Friday last."—*China Mail, 29th Oct.*, 1857.

Sayings and Doings.

A case of mutiny has occurred in the ship *Raritan*, Capt. Wyatt, which, at the Greenock Police Court, has been designated by the magistrate as the worst case he knew of that had ever been before the Court, and which he told the mutineers had it occurred in the Navy some of them would have been hung and the rest severely flogged. He considered the punishment too light for them which sentenced them to twelve weeks' imprisonment with hard labour.

It was reported at the Sandwich Islands that the Russian Government had issued orders to prevent American whalers from fishing in Russian waters. A Chinaman had determined to commence the silk culture, and for that purpose had set out mulberry-trees, and was making other preparations to carry on the business. Her Majesty's surveying steam-ship *Plumper*, Capt. G. H. Richards, was at Honolulu.

A powerful iron screw steam-ship has just been launched from the building yard of Messrs. Charles Mitchell and Co. of Low Walker on the Tyne. She is 1,100 tons builders' measurement, is named the *Oudaloy*, and is the property of the Russian Steam Navigation Company. She is built for the Company's traffic in the Black Sea and the Sea of Azof. In these localities the draught of water is limited, and the *Oudaloy*, when laden with a cargo of 1,100 tons dead weight, will only draw 13 feet of water. It is intended to look to the sails as a motive power, and she is barque-rigged, and fitted up with all the modern improvements. Forty-six vessels have been built or are in course of building for this Company in England, and we believe that they will trade with almost every port in the Black Sea and the Levant. A large patent slip way and other machinery for repairing vessels at Odessa are also going out from England.

The captain and mate of the *Elizabeth*, charged with causing the death of a Spanish sailor during the voyage from New Calabar, are committed for trial by the Liverpool magistrates,—the captain for manslaughter, and the mate for assault.

Important Discovery.—General Piobert, French Artillery, and a member of the Institute, has made a discovery by which the explosion of gunpowder in magazines may be prevented. It consists simply in mixing the gunpowder with coal dust. When the gunpowder is required for use, it is only necessary to sift it; the coal dust falls through the sieve, and the gunpowder resumes its original qualities. The experiment has been tried on a large scale with complete success. A magazine filled with gunpowder so mixed was set on fire. "No explosion took place," says the *Moniteur de l'Armée*. "The gunpowder burned like other combustible matters, such as pitch or tar, and the fire was extinguished with common pumps."

Dismissing a Captain.—Lord Campbell said, the defence set up was, that the plaintiff was not fit, in consequence of intemperate habits, to have the charge of the vessel. If the jury should be of that opinion they would say that the defendant was justified in the course he had taken; but was that defence made out to their satisfaction? Capt. Younghusband himself stated that on the day in question he dined with the officers of the Artillery on board his ship, and that he had only taken a moderate quantity of wine; and Mr. Clarke,

the Clerk of Arraigns at the Central Criminal Court, and other gentlemen who had known him intimately for many years, gave evidence that he was a gentleman of most temperate habits. To support the plea of intemperance they called Mr. Mare, who stated that he had been grossly offered by Capt. Younghusband, but the captain made a most ample apology, they shook hands, sat down, and took wine together, and after that Mr. Mare made a report to the owner of the ship that the captain was in a state of inebriation when he visited the vessel. He (the learned judge) owned it seemed to him that there was nothing which could, to the mind of any reasonable man, justify such conduc't and that it was most discreditable. After some further remarks, Lord Campbell left the case to the jury, who, after a short deliberation in the box, found a verdict for the plaintiff—Damages £600, including £60 which the defendant had paid into Court.

The decision of the Admiralty Court in the collision case between the *Helena* and *La Plata* steamer in favour of the former has been reversed by the Judical Committee of the Privy Council, which has decided that the evidence does not support the complaint that *La Plata* was guilty of negligence from which the damage arose, and therefore she is not liable. Hence the decision of the Admiralty Court was reversed with costs.

In the cases of the *Celerity* v. the *City of London*, s., (collision,) and the *Intrepid* v. the *Jonge Andries*, (salvage,) taken before the Privy Council from the Admiralty Court, the decision of the latter has been confirmed with costs.

The Russian Government has issued what is intended as a justification of her recent violation of the Treaty of Paris in closing certain ports on the eastern shore of the Black Sea, alleging that the clauses relating to quarantine and maritime police in those waters contain the permission on which Russia has acted. We may remind our readers that those clauses refer to ships, not to ports. The Treaty provides, while stipulating in express terms for the freedom of the Black Sea, that the sea-bordering powers may keep armed vessels (the number and size specified) for the purpose of enforcing customs and quarantine regulations. Out of this concession Russia pretends to derive the right to close a number of ports at will; but she has just as much right, in accordance with the Treaty, to occupy the isle of Serpents, to organize a fleet at Nicolaieff or Sebastopol, or to establish a blockade of the ports on the coast of Turkey, or at the mouth of the Danube.—*Mitchell's Maritime Register.*

The following advertisement appeared in one of the St. Petersburgh papers, "To be sold, portraits of Nana Sahib, the Indian Chief, the slayer of the English, at fifteen copecks each, the proceeds for the relief of the sufferers in the Crimea."

TO CORRESPONDENTS.

"S. T. F. S." The proposal is not new, and only entertained by those who are not sailors.

ERRATA.

Page 681, line 18, *for* the indirect *read* in the direct.
„ 682, „ 7 and 33, *for* Rudha Squi *read* Rudha Sgeir.
„ 682, „ 22, *for* Leesmore *read* Lismore.
„ 39, „ 19, *for* South *read* Sound.

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

FEBRUARY, 1858.

Loss of the Barque "Mahaica," *of Greenock, Scotland, on the Coast of Australia, and Narrative of the Sufferings of her Crew. By Edward Duncan, Seaman, one of the Survivors.*

On the 9th of May, 1854, I sailed from Port Phillip, Australia, in the barque *Mahaica*, of 280 tons register, in ballast trim, bound to Calcutta. We had variable winds until the 28th, when a favourable and steady breeze sprung up from the S.W. This continued till the morning of the 30th, when, at about 2h. a.m., while the watch on deck were busily employed making sail, the vessel suddenly struck on a coral reef, which had not been observed until we were close aboard of it. It happened that one of the crew forward hearing a noise similar to breakers, and at the same time thinking he could see them ahead, told the mate, who immediately called out to the man at the wheel to put the helm down; but before she could answer it she struck with an awful crash. The fore and main topsail halyards were let go; but she began to settle down shortly after striking. The wind being right aft, it was impossible to back her off; so seeing this, we thought the less canvas she had on her the better, as it would only drive her further on the reef.

We now began to prepare for leaving the wreck, and managed to get some bread and a small breaker of water stowed in the long boat, which was immediately launched over the side. But she had no sooner touched the water than a heavy sea struck her port side and stove it. The second mate and I jumped into her to bale her out, but soon

found it useless, as she leaked much faster than we could possibly bale. The remainder of the crew were busy launching the jolly boat, which having done, they immediately jumped into her, and took us out of the long boat, and she sunk shortly after we had left her. Happily we managed to save the bread, but unfortunately lost the breaker of water. Backing the boat astern out of the surf, we pulled away from the wreck for about a mile, and then rested on our oars.

While we were thus congratulating ourselves on our escape, a heavy squall came on, which every moment we fully expected would have swamped the boat. The squall lasted until daylight, and we then pulled back towards the barque, which was now under water excepting her jibboom and the masts. So finding we could not save anything, we started at once for the land, which the captain calculated to be about three hundred miles distant. On taking account of what was in the boat, we found all that we had saved from the vessel was a quadrant, a compass, a bottle of wine, and the bread. The captain had his gold watch, and fortunately we had a gallon tin measure, which it will be seen in the course of this narrative was of great service to us. Fortunately, no lives were lost. We numbered eleven, all told, namely, the captain, first and second mates, five able seamen, cook, steward, and a boy; and we also saved a little dog which we had on board.

Tired of pulling, we took the blankets and converted them into sails, which answered pretty well. There was a strong breeze, and a heavy sea running, both of which were fortunately favourable for making progress with our small craft. After we had become a little settled, and everything was in as good order as circumstances would allow, our captain gave each of us as a small portion of the wine. We did not eat any bread, thinking it best to be as economical as possible under our present circumstances, and we resolved to do without eating as long as possible. The next day, however, on trying to eat we could not, as our throats were parched and dry from want of water, which we anxiously craved for.

We got over this day, but the following morning we were suffering much from thirst, which was almost unbearable. The captain served out the remainder of the wine, still we could not eat, and on making the attempt, we were almost choked with the hard dry biscuit; so the trial was given up as hopeless. The captain strove all he could to cheer us up and hearten us, and though we tried all in our power to be cheerful, we were in fact most miserable, as we afterwards confessed to each other, and thought only of death, which to us seemed to be our certain doom.

Thus we continued until the fourth day, when about the middle of the afternoon we discovered a barque. The very sight of her put new life and strength into us. She was close hauled for two hours, and we strove all we could to come up to her, but found it impossible, for she was going at the rate of three miles to our one. We felt certain she could not have seen us, as there was a heavy sea running, and our boat being small was mostly buried as it were in the trough

of the sea. We lost sight of her in about three hours after she was first seen, on which a feeling of despair spread among us, as we considered our only chance was gone. But our captain again encouraged us, cheering us on to hope for the best; and we all endeavoured as well as we could to follow his advice.

We now once more steered for the land. The next day some among us proposed to kill the little dog for food, to which others would not agree, remarking, that if we tasted blood we might want more, and who then could tell what we might be led to do. We then agreed that come what would we would not kill the little animal. Shortly after this was settled two of our number began to show signs of insanity. They commenced by laughing and talking in an incoherent manner, and seemed to think they were ashore purchasing fruit and drink. The boy also showed the same signs, but instead of being in a merry mood he seemed to be full of fear that we should kill him for his blood, as he kept praying us to spare him. This he must have got into his head from hearing our reason for not killing the dog. The idea seemed to have worksd upon his imagination and thus produced the fears he expressed. The time passed very dreadfully, and unhappily the next day two more of our shipmates commenced raving. This madness we considered as the effect of the salt water which the four men and the boy would drink when they found their thirst past enduring. The rest of us were kept constantly employed in managing the boat, and preventing our poor sick comrades from leaping into the sea.

This day being Friday was the sixth after our wreck, during which time we had had neither food nor water. I now suffered much from thirst, and thought of a plan which might give us relief. We all had flannel shirts on, and I took mine off and soaked it in the sea, and after wringing it put it on next my skin, and found great relief from doing so. My five companions did the same and also felt relief; we also soaked the shirts of the sick men and boy; but they seemed not to care about it, as they showed no signs of change in feeling on putting them on again, but continued raving.

Saturday passed in the same miserable manner, and during the forenoon of Sunday we gave ourselves up to despair, seeing nothing but death staring us in the face, and that a most dreadful one, unless we too went mad; which if we had I suppose we should have jumped into the sea, as the others had several times already attempted.

About twelve on the Sunday morn, the land loomed before us. We were at first doubtful, thinking we were deceived; but as we neared it it became clearer; and when doubt gave place to certainty, we sobbed and cried like children through very joy! Catching the poor boy, who was nearly reduced to a skeleton, (as indeed we all were,) in my arms, I pointed to the land, trying to make him understand; but almost as I was speaking to him he died. We then tried to cheer up the other four men, but found it useless, as they were unconscious of what we said. We now strove hard to make the land before sundown; but it was nine o'clock before we were near enough

to hear the breakers on the beach. We then took in our blanket sail, which had answered very well, and commenced using our oars, and shortly after we were in the first breaker; the second and third nearly filled our boat: we now, however, were in shallow water, so jumped out, taking our sick comrades with us, placed them in a safe place, and returned to the boat, which was aground.

We had barely got the bread and other articles out, when she was entirely stove and thus rendered useless. The little dog had jumped from the boat, and after getting ashore he ran inland, and we never saw him afterwards, and considered that he had gone in search of food and water, and must have been either killed by native dogs or have died from exhaustion. We regretted his leaving us, as we had hoped he would have been useful to hunt up small game, which we had to do afterwards for subsistence.

Our first care was to search for water; we could not find any near where we had landed, so wandered some distance from the beach. The ground was covered with trees, bushes, and grass; we tore up some of the latter and ate it, and felt immediate relief. After we had somewhat moistened our throats, we sat down on the grass beneath a large tree. About the middle of the night I rose to gather more grass as I felt thirsty. After which, I looked at each of my comrades to see if they slept. I found two of the sick were dead; and the remaining two nearly so. I roused my shipmates and told them of this sad affair. We sat up the rest of the night with the other two poor fellows, and tried every means we could think of to give them relief; but they were too far gone, and it is my opinion nothing in the world could have saved their lives. Thus we passed our first night ashore.

At daylight we commenced searching for fresh water, but could not find any, so were nearly as badly off as when in the boat at sea. We tried the sand on the beach to moisten our mouths, but found no relief from it; so we again tried the grass, and after eating a good quantity of it we went on our hands and knees and licked up the dew; but after using all these means we were not satisfied, and felt as thirsty as ever. Our two sick men were quite speechless, and still lying under the tree; so seeing they were not likely to move, we thought it best to go into the bush and have a good search for water. Accordingly we started, after placing the dead bodies of our shipmates by themselves, and covering them with rushes and grass. We took the bread with us, and continued to look for water until the afternoon, when about four o'clock, to our great joy, we found some. We were almost frantic with joy at this discovery, and all made a rush for the water, of which we must have drank over a gallon each before we felt satisfied. We then thought of our poor shipmates, and after filling our measure we retraced our steps as quickly as we could, and reached our first night's resting place about nine in the evening. Without loss of time we tried to pour some of the water down the sick men's throats; but relief arrived too late, half an hour after one of them died, and the other was so far gone that he only lingered

until the morning. These deaths left only six men out of the ship's crew. During the night we were startled by a number of native dogs yelping about us. We did not know at the time that they were dogs, and supposed them to be some wild animals, so we drove them away by throwing stones and shouting as loudly as we could; and thus we passed our second night on this dismal shore.

We commenced next morning to dig holes in the sand to bury the bodies of our deceased shipmates; but having no shovels or other tools we were compelled to use our hands, and therefore made the holes only so deep that when the bodies were laid in the sand barely covered them. On first discovering water we ate some of the biscuit, and enjoyed the meal much, feeling refreshed afterwards. We now thought the sooner we tried to get to some civilized part of the island the better. We held a council, and finally settled to proceed along the beach, thinking by so doing we might reach Moreton Bay.

As soon as we had come to this determination, we overhauled our provisions, and found our whole stock to consist of twenty-one biscuits, being three and a half per man. We took heart and at once got up and made a start, on our long and trying journey. We continued walking until about one o'clock, when we stopped and dined off half a biscuit each, washed down with a little water, having taken care of that which was in the measure which we filled for the poor fellows who had died. After a quarter of an hour's rest, we again started, travelling onward until sunset, when we then stopped for the third night.

At daylight we again started, having passed the night tolerably, although we found it very cold, and we had slept but little. But we had not proceeded far when we came to a river, the sight of which was so grateful to us that all we thought of was to obtain a supply of fresh water and rest by it for awhile; but our captain considered it the wisest plan to press onwards, and get water from some water hole in the bush. So losing no time we swam the river, making our clothes fast to the head of the best swimmer, so that they should not get wet. We travelled onwards, keeping South by the sun. In the afternoon we rested, then went into the bush to search for water, but found none; and on endeavouring to eat another half biscuit each, we could scarcely take a mouthful, our throats suffering from thirst. In fact, we were as dry as chips, and so resumed our journey about five o'clock in the evening.

We soon came to another river, on the banks of which we stopped; and here we passed the fourth night of our journey in a way similar to the last. The next morning we crossed the river, still keeping southward, but inclining more inland, hoping thus to fall in with water. After making some distance we stopped to rest, as all of us felt great weariness. We noticed the grass being wet, as a heavy dew had fallen the previous night, so I took off my flannel shirt, and after trailing it for some time along the wet grass it got pretty well soaked and we squeezed it into the measure and shared it among us

as fairly as possible. This enabled us to swallow some biscuit, and on this day we finished, alas! the whole of our stock of bread.

Walking on until evening we halted beneath a large tree, where we thought we could pass the fifth night of our dreary journey in this wild country. But vain were our attempts to sleep; a continual torment of sand-flies and mosquitoes rendered it impossible, and to avoid this we would have travelled onwards, but could not see our way as there was no moon. So at break of day we were again gladly on our legs, although so weak as to be scarcely able to stand. We were also suffering much from thirst, so we again had recourse to trailing the shirt in the grass to collect the dew, although the quantity was trifling. But we found some relief even from this plan, and we continued moving onwards the whole of the day, being the fifth of our journey. But, alas! we had nothing now to eat and only dew to drink.

We had selected a place in the bush for the night, but from thirst and hunger and the depressing effects of our situation combined we could not sleep, and the long hours of night were passed in talking over our chances of escape from our misfortunes and of reaching some settlement. Of course we considered this was to be done, although at times a feeling of despair seemed to render it impossible.

At the first appearance of dawn on the morning of the sixth day we again started on our journey and continued onwards until we gradually found ourselves in a thick scrub or low forest; where, after walking some distance, we lost our road and wandered about for at least six hours before we could find our way out of it into the open country. For while we were in it the sun could not be seen, which rendered our situation still more disheartening. Having walked about an hour or two after leaving the scrub, we suddenly came to a water-hole; on which our joy was so excessive that we made a simultaneous rush to it, and drank until we were ready to burst. Then, filling our measure, we journeyed onward, but met with no other adventure that day, and stopped at sundown in the bush.

In course of this night we suffered so severely from hunger that we could not sleep. About ten o'clock we were alarmed by hearing a noise close to us and, getting up, discovered that it was made by a very large kangaroo, who on seeing us made off as quickly as he could by taking immense bounds and leaps. We stood gazing after him until he was out of sight, and then again laid down even more miserable than before, for we had seen the means of support but could not secure them, having no weapons.

We heard nothing more that night, and at daylight on the seventh morning that we had been travelling in the wild bush, after journeying three hours, we thought it time to rest. We accordingly sat down a little distance from some thick low bushes. Just as we had commenced talking over our prospects one of us thought he heard a low twittering sound, such as is made by young birds. So, immediately starting to our feet, we commenced a search, and after a little

labour we found a nest of five young birds, scarcely fledged. Securing them quickly they were divided into six shares, which we devoured raw, washing the dainty and acceptable meal down with a drink of water from our measure. After which we pushed forward, travelling until night, and then stopped on the edge of a dense scrub. But, as before, to sleep was impossible, being so horribly teased and tormented by sand-flies and mosquitoes.

In the morning we continued on, but nothing occurred during the day. We were unable to find anything to eat; indeed it was something surprising to us when we fell in with food, as there appeared to be no wild fruit of any kind growing, and a person in Australia must have weapons or snares to capture game for food. Thus passed our eighth day. At night we stopped near some bushes, but had not lain there long ere we were alarmed by seeing a centipede. We tried to catch it but could not, and perhaps it was as well, as we learnt afterwards they are rank poison. Retreating from the neighbourhood of the bushes we laid down in an open space of ground for the night, and the next morning we were stirring early and the first thing we did was to examine the bush in which we had seen the centipede. Here we found another and a scorpion, both of which made their escape from us. These discoveries, however, made us at the time still more wretched, and we thought ourselves the most unfortunate beings in creation; but on finding out, as we did some time afterwards, that had we eaten them we should have died in the greatest agonies, we then saw that we had reason rather to thank God that we could not catch these reptiles.

We walked on until about ten o'clock, but I believe we had not gone above three miles since daybreak, for we were now reduced to a very weak and miserable condition. However, after resting about half an hour we continued on until about three o'clock, and again came to the banks of another river; the water of which, to our disappointment, was salt. Our strength was so much reduced that we were afraid we should not be able to swim across this river; but, considering we might as well be drowned as starved, we each secured our clothes over our heads for the attempt. Twice we tried to get over without succeeding, and the third time, taking a narrower part, to our great joy we effected the passage.

On this, our ninth day, we continued walking until five in the evening, when we came to a water-hole; where, after each of us had taken a good drink, we consulted as to whether it would be better to remain here for the night or proceed. We decided to stop, and after resting awhile it occurred to us that we should feel better if we were to give ourselves a good wash. So, stripping off our clothing, we washed from head to foot, and after drying and dressing, we laid down, felt much relief, and had a little sound sleep. Towards morning one of our companions began to complain very much: he was the weakest of the party. We tried to cheer him up all we could, and started at daybreak after taking a good drink of water and filling the measure. About noon we came to another fresh water river;

and as our legs and arms were sore from bruises and scratches received in travelling through the bush, we thought another good wash might benefit us materially. So we commenced washing and felt comfortable after the operation. This river was so shallow in places that we could walk over.

While employed dressing we were suddenly surprised by hearing a shout, which we knew to be a human cry. At first we were much alarmed, being quite sure we should be murdered by the natives. But as we supposed the shout had proceeded from some of them, we thought it better to reply, and accordingly we holloaed as loud as possible, and were answered by an old man who now approached us from the other side of the river. We eagerly beckoned him to come to us; but after looking at us for a few moments he commenced yelling at the top of his voice and jumped about like a monkey. He was in a state of nudity and appeared to us the very specimen of a savage. We concluded from his manner that he had never seen a white man. At all events I am quite certain that he had never before seen such an unshaved, ragged lot of miserable looking beings as we were. After he had finished his capers he advanced a little towards us; on which we made signs that we wanted food. He then beckoned us to follow him, which we did immediately, although he had his club or waddie and a spear. Following him, we fully expected we should fall in with a tribe of natives not far distant. He struck off through the heart of a thick scrub, taking a foot track; in which we met an old native woman with whom our guide appeared on intimate terms, for he commenced talking to her and after a few signs and many pointings to us she appeared satisfied, although on first seeing us she seemed bent on retreating. Matters being thus settled between them, our captain advanced with his gold watch in his hand, offering it to her and pointing to his mouth to let her see we wanted food. She was delighted with the watch and at once gave us some kangaroo flesh, which she had stowed away in a net hanging suspended at her back. She was also loaded with bark, which we afterwards learnt was used to build their huts or mi-mis, as they call them.

We then made signs to the old man to proceed and had not gone far when we came to a sort of camp where they had been staying. The man soon kindled a fire with a burning stick he carried with him, and from what we saw of the habits of the natives afterwards, in our wanderings through the bush, we learnt it was their custom to take a firebrand from the last place of encampment to the next, though they get a light sometimes by rubbing the end of a stick sharply through a piece of touchwood. After making up a good fire they left us, returning, however, soon, accompanied by three other natives. These were the most frightful objects, being covered from head to foot with red spots, made with a kind of paint called by them kareo. Their hair was decorated with parrot and cockatoo's feathers arranged in rather a tasteful manner, and in their hands they carried their heavy clubs.

When they had satisfied themselves by looking and examining us they began to talk and make signs, nothing of which we understood. They were thorough savages, beings in a state as uncivilized as any in Australia. First they pulled our hair, then they pinched our arms and legs, and then they examined our clothing most minutely, appearing to think the latter was a kind of skin growing on us. So, to show them it was not, we turned up the legs of our trousers and our coat sleeves—at least what remained of them; at which they appeared more surprised than ever, and after a very long palaver and frequent looking and pointing at us, they seemed at last to have settled it that we were actually human beings, and certainly from their manner we must have been the first whites they had ever seen.

They now left us and went away, and as we had all had a hearty meal off the kangaroo flesh and washed it down with water from a hole close at hand, we agreed it would be best to lie down and sleep for the night by the side of the mi-mi fire. Accordingly as it was nearly dark we composed ourselves, though we felt uneasy about the natives, as they appeared to be so savage a set. Still, to escape from them was impossible had we desired it; so, for the friendly manner with which they had acted towards us we resolved to trust them, and slept well through that night until daybreak of the eleventh morning of our distress. Our fire, made of an immense log, was burning, and would do so apparently for two days.

While sitting around it conversing on our prospects, the natives came up with two fresh companions; from which we supposed there was a tribe near us, but could not account for so few coming to pay us a visit. However, we were very happy to see them come, as we believed they would bring us some provisions; and we were not wrong. They had with them some small fish, which were presented to our captain, who immediately apportioned to each man his share. We attempted to show them by signs how very thankful we were, but they did not appear to comprehend us. After our meal we tried to learn where the nearest European habitation was, but all we could glean from them was that we must go South to some place they called Wibey; by this we afterwards found they meant White Bay, in the direction of which they pointed. We made signs for one of them to go with us as a guide, but had no sooner done so than the old woman began to yell, holding first one man, then another; from which we concluded they were her sons. None of them would accompany us; so, seeing it would be only loss of time to attempt further persuasion, we bade them good bye, and having filled our measure with water, recommenced our journey. The natives, observing we were going, showed us our road and went with us for a mile or so, when they put us on the right track and left us.

Following the track until near sunset, and coming to a very nice, pleasant part in the bush, we agreed to stop for the night; and though we had some water left, we thought it best to save it until the morning. This night we enjoyed some sleep and started early on our track. About ten in the morning we came to a tree which was

loaded with berries similar to the English hips and haws, and on shaking the tree a large quantity of them fell, which we quickly picked up and as eagerly devoured. About an hour after eating these berries we all felt very sick, and thought it best to lie down immediately where we then were. We did so and remained in a suffering condition until the middle of the next day, when, feeling somewhat better, we again started. After walking a short distance we had the good fortune to come to another water-hole; from which we each had a hearty drink and filled the measure, and then went our way. In about an hour after we came on a track which we supposed was made by natives. We followed it for a considerable time and fell in with two kangaroos, which on seeing us bounded off as fast as they could. We looked after them anxiously until out of sight, and would have given anything to have been able to kill them. Moving forward, we became lost again in the scrub. In endeavouring to find the track we came across two snails. Having divided them into six parts they were eagerly devoured by us and, with a drink of water, formed to us an important meal.

The scrub soon appeared less dense and in another half hour we were in the open plain again, and pushed on till sundown; when, lying down under a tree, we agreed to remain until the morning: this completed our thirteenth day in the bush. This night we could not sleep on account of the heavy dew. We found it very cold, and as we could not see the remotest chance of meeting with our fellow creatures again, we began to lose heart.

In the morning we had not proceeded far on our miserable journey when we saw some nuts lying on the ground. These we picked up and commenced eating. They seemed nearly as sweet as chesnuts, which they somewhat resembled. After eating some, we gathered sufficient from the tree off which they had fallen to fill our shirt breasts. They were contained in a shell or pod—three or four in each,—the pod having somewhat the appearance of broad beans.

After gathering as many as we wanted we journeyed on, walking until the afternoon, when we observed a great smoke, which cheered us greatly and induced us to increase our pace in the hope we might fall in with some English habitation, if not with some natives. But we were soon disappointed on finding it proceeded from a burning tree, which we supposed had been fired by the natives, signs of their having encamped here being evident from the bones of a kangaroo, which seemed to have been roasted. We gathered all these bones, and after eating some of our nuts or beans we sucked them, and, with a drink, considered we had made an excellent meal.

(To be continued.)

The Indian Ocean considered with Reference to the Wants of Seamen.

(Continued from vol. xxvi., p. 640.)

A course may then be taken for the Gulf of Bengal between Pulo Way and Pulo Brasse by a vessel bound to Pondicherry or any port on the Coromandel coast, taking care while out at sea to profit by every change of wind to gain westing. Weatherly vessels have made this passage in fifteen days in the strength of the S.W. monsoon.

These routes have been here described in detail because they afford a general idea of the navigation which should be adopted in all seasons by vessels passing to or from ports on the coasts on either side of the Gulf of Bengal to the opposite. The following will complete our details.

From the Coromandel Coast to Mergui.—Vessels from the Coromandel coast bound to Mergui, between the 1st March and the middle of September are obliged by the westerly and S.S.W. winds to pass to the southward of the Little Andaman, after having reached the parallel of 10° 10′ or 10° 15′. If the Ten Degrees Channel were crossed within these parallels they would be able to sight this island and thence steer with more confidence for the eastern coast, which should be made about the Torres Islands. Although it may be unusual, especially at this season, to meet with westerly currents, it will be advisable when the Little Andaman is not seen to make good some thirty leagues beyond the reckoning before standing to the northward, in order to avoid the error of falling in with this island during the night when it was supposed to have been passed. In the same manner a vessel on leaving the coast of Coromandel may steer for the Sombrero Channel. D'Après considers this special precaution useless, and he thinks a vessel would be far enough to windward by taking the Ten Degrees Channel. In the passage from the Andaman Islands to the eastern coast of the gulf vessels are often set to the eastward by the current, and therefore it should be provided for.

The islands of the Mergui Archipelago are high, and soundings may be had in the offing that will prevent all danger. When these are made a ship should steer for Isle Cabosa; then, to enter the archipelago by steering to the eastward, she may pass either North or South of this island, leaving the western Canister Island to starboard, and then follow the directions if bound to the port of Mergui.

From Mergui to the Coromandel Coast.—The departure from Mergui for the Coromandel coast should not be later than the 15th or 20th December, in order to reach it in the beginning of January—the season a vessel may make it in perfect safety. The N.E. monsoon being at this season in full force, a vessel leaving Cabosa Island should pass between Preparis and Cocos or between the latter and the Great Andaman. From thence she should run for the Coromandel coast, taking care to make the land North of the port to which she is bound.

For a vessel not leaving Mergui before the beginning of February the safest route is to pass South of the Little Andaman. At this season she should profit by the winds, which in the Gulf of Bengal blow more frequently from the South than the Northward.

A vessel leaving Mergui during the S.W. monsoon for ports in the Gulf of Bengal, Acheen, or the Strait of Malacca should follow the same route as when going from Rangoon to these ports during the same monsoon.

Pondicherry or Madras to Acheen.—The most favourable season for leaving the Coromandel coast, from Pondicherry and Madras, for Acheen is between the 15th August and 15th September, that is, towards the end of the S.W. monsoon. During this monsoon, and more particularly between 15th August and 15th September, M. D'Après states that a vessel having reached the offing would meet W.S.W. winds, varying to S.S.W., by which she should profit to make the island of Sumatra on the parallel of 5° N. lat. She will thus be to windward of the channel of Surat, which, although narrow, is the best we can select in going to Acheen. Captain Carnegie says that on leaving Pondicherry or Madras during the S.W. monsoon, if we are going to the Strait of Malacca it is better to take the Ten Degrees Channel than keeping to windward for Acheen.

Pondicherry or Madras to Acheen and the Strait of Malacca.—During the N.E. monsoon, and at its commencement, the same Captain tells us that a vessel on leaving Pondicherry or Madras should sight Sumatra South of Acheen, and then take the Surat or Bengal Channel according to whether she is going to Acheen or the Strait of Malacca. She would then work along the Sumatra coast as far as Diamond Point, when from this point she would lay up for Prince of Wales Island.

Towards the end of the N.E. monsoon or after the 15th February, when the southerly winds are beginning to be established near the land, it will be advantageous to make northing along the Coromandel coast and then stand out to sea, so as to pass between Cape Negrais and the Great Andaman, or else to take Duncan Channel, between this island and the Little Andaman.

In these passages, D'Après says, northerly currents are seldom found, but frequently those from the southward. When observations cannot be had it is safer to consider that the vessel is set to the eastward. It will be safer to mistrust them, for we may expect to find the land sooner than we think for.

From the Strait of Malacca or Acheen to Bengal.—A vessel leaving the Strait of Malacca or Acheen during the S.W. monsoon for Pondicherry or Madras should keep near the North coast of Sumatra (the coast of Pedir), where she will find a westerly current, with land breezes. She would also pass Acheen Roads, and if the weather is bad may anchor there if necessary. Thence she would make for the Bengal Channel; from whence she would easily weather the Nicobar Islands, and would have a fair wind for the ports on the West coast of the gulf, and even Calcutta. If bound for Pondicherry or Madras,

and the wind veers West, she would probably have to make some tacks in order to gain her destination; but in no case should she cross the line. When she is working to the westward it will be better to stand in for the Coromandel coast to the northward, and afterwards to work along the land for her port.

From the Strait of Malacca to Pondicherry and Madras.—As the weather on the Coromandel coast during the N.E. monsoon is bad, it is better not to leave the Strait of Malacca before the 10th December. From Malacca a vessel should shape her course for Pulo-Pera, taking care to avoid the dangers in the middle of the Strait of Malacca. From Pulo-Pera, in going to Pondicherry or Madras, she should steer for the Nicobar Islands, passing either between these islands or South of them. Some Captains prefer the Sombrero Channel and others the Ten Degrees Channel. If she is going to Masulipatam or Tanaou, after leaving Pulo-Pera she may steer a course to pass South of the Cocos Islands. She should then make for her destination, keeping well to the northward of it, especially in January, so as not to be set past it by the current.

Strait of Malacca to Ports on the West Coast of India.—A vessel leaving the Strait of Malacca towards the end of October and November for ports on the West coast of India, from Pulo-Pera should shape her course South of the Nicobars, and should then stand to the westward, in order to make the coast of Ceylon in the latitude of Aganis. She would then stand along the South coast of Ceylon and haul up for Cape Comorin.

Routes from India to the Strait of Sunda.—A vessel leaving Ceylon or any port on the Coromandel coast during the S.W. monsoon for the Strait of Sunda will find the S.E. monsoon prevailing South of the equator. She must, therefore, in making her easting keep as much East as possible North of the line. She should steer so as to cross it in 93° or 94° E., and it is probable that with South and S.S.W. winds in squalls she would be far enough to the S.E., or nearly so, to pass at a proper distance from the islands on the West coast of Sumatra, tacking to the S.W. occasionally with the wind from S.E. In this route northerly currents are common; nevertheless a vessel taking advantage of the shifts of wind may easily get to S.E., seeing that near these islands the wind often becomes South and S.S.W., while out at sea the S.E. wind prevails. She should therefore cross the equator well to the eastward, as above said, and keep at a moderate distance from the Sumatra coast.

If she is bound to Bencoolen she should get on its parallel before steering for it, passing to the northward or southward of Trieste Island, according to the prevailing wind. If the vessel is going direct to the Strait of Sunda, reaching the entrance of the strait, she should keep off the land, for it is easier then to work to windward than by keeping near the shore. Nevertheless, in all seasons a good sailing vessel may make her passage from Bencoolen to the strait and back by keeping in with the land.

In all seasons in coming from sea it is prudent to make direct for

Cape Java if desiring to take the Strait of Sunda, and a ship may borrow to the westward or eastward as she approaches the entrance of the strait, according as she has the wind or current.

A ship leaving Ceylon or any port on the Coromandel coast for the Strait of Sunda while the N.E. monsoon prevails North of the equator will find the N.W. monsoon South of it, and must take nearly the same route as that pointed out for the other monsoon. She should get to the eastward in order to cross the equator on the same meridian.

Leaving Ceylon in the month of October, the season when the N.W. monsoon is not always found South of the equator, a vessel should stand out to sea if she has the wind from N.E., in order to make some degrees of easting before crossing the equator with it, which is met with from November to March on leaving Ceylon.

In December, January, and part of February we generally find the N.W. monsoon fresh South of the equator, and a vessel may steer direct for the Strait of Sunda as soon as she clears the S.E. part of Ceylon.

In leaving the coast of India for the eastern straits during the S.W. monsoon a ship should follow the route already pointed out for the Strait of Sunda, and she will find the S.E. monsoon South of the equator. She would then get on a bow-line for the Strait of Sunda against the S.E. monsoon, which is very strong in June, July, and August, producing westerly currents. It will therefore be necessary to make long boards to the southward at this time, while about the beginning and end of the monsoon the wind is variable.

During the N.E. monsoon a ship leaving any port of India should take about the same route for the eastern straits as for the Strait of Sunda. When bound to those straits East of Java in the height of the N.W. monsoon, which prevails South of the line, she should sight the Island of Noussabarou, particularly if she be uncertain of her position, for in November and December cloudy weather is often found on the South coast of Java along with strong winds and easterly currents. If the land is made to the West of Noussabarou she will find by keeping four or five leagues off shore finer weather, in all probability, than by keeping out to sea.

A vessel leaving the Strait of Sunda for Madras or ports on the Coromandel coast during the S.W. monsoon should steer for the mountain called the Friar's Hood, on the East coast of Ceylon; then, running to the northward, should take care not to make the coast North of her destined port.

In the same season, when she is bound to the western coast of India, she should run to the westward with the S.E. trade, and take the southern route, between the Chagos and Seychelles.

A vessel finding herself near the equator in April or October, when the N.W. and northerly winds prevail in the northern hemisphere at the change of monsoon, if the wind inclines westerly may run for any of the ports on the coast of Malabar and reach Mahé. If she is bound to Bombay she should stand to the northward to the East of the Maldives. But should she be some degrees West of these islands

before reaching the equator, it will be better in April, the end of September, and October to pass them on the West, in order to reach that port.

During the N.E. monsoon, in returning from the Strait of Sunda to the eastern coast of India, a vessel should steer so as to pass Hog Island or Cape Acheen about sixty or eighty leagues distant, and then follow the directions given for Route No. 6.

In the same season if she is for the West coast of India she should cross the equator between the meridians of 82° and 81° E. long. In the vicinity of the equator, in fact, and in a space to the northward of it, westerly winds are frequently met, with which she may reach Point de Galle. Thence she may cross the Gulf of Manar and proceed up the Malabar coast, remembering what has been said concerning the winds and currents on the western coast of India, and the navigation of that coast.

We shall here conclude these directions for making passages in the Indian Ocean. Those which are here described will suffice to show nearly all others that may be adopted for crossing it. In considering and comparing them with those which are made direct between the same points, some idea may be formed of the great advantage which steam-vessels have over sailing vessels in this extensive ocean.

(To be continued.)

The Principal Evils of our Merchant Service.—No. VI.

The Décret Disciplinaire. Chapter 3.

Resuming our remarks on the *code disciplinaire*, it appears that by Art. 91, every captain, master, or commanding officer, who with criminal intention steers a false course, or throws overboard or destroys without necessity the whole or part of the cargo, provisions, or effects of the ship, shall be punished by hard labour for a term.

The act of steering a false course, though not explained literally in the category of our nautical crimes, is generally done with the intention of committing the crime of barratry, which is explained in the last number of the *Nautical* as subject to the same punishment as the act itself, and such a case may be thus exemplified. We will suppose a large brig coming from the southward, ostensibly bound for Harwich, in command of a person well acquainted with the East coast, and who intends to lose his vessel if he can on the Long Sand Head. Pretending to round the Sand, he sends his men forward and takes the helm himself. The brig is old, the owners do not like repairs, and parties concerned wish to wind up the account. The weather is thick and rainy, with a long swell and a moderate breeze from the eastward. Now is the time to lay her on the Long Sand Head. The commander

knows the place and proper time of tide for the purpose, so that once on she will never come off again, and the smacks will be in time to take off him and his crew. A less skilful hand would lose all their lives; but he knows what he is about.

He edges two points to the westward of his proper course, with his men unconscious of any sinister intention; but as they approach the break of the sea they do not like the look of it, and call out, "Breakers ahead, master." To which he of course coolly replies, "All right, keep a good look out!" But just as the brig is about to dash into the sand, the hands forward getting alarmed, let go both anchors, and bring her up all standing, and this intended barratry may then become merely a case of salvage if he requires and obtains assistance to extricate him from his position. But for this interference the act of barratry would have been complete.

Keeping a false log also may involve the steering a false course, which is sometimes done when there are strong motives for concealment. The heaving overboard of cargo to which this article also alludes may be done with fraudulent intent under the pretext of lightening a leaky or overloaded ship.

By Art. 95, every act of rebellion committed by more than one third of the ship's company, is punished by close confinement; if the rebels are armed the punishment of hard labour for a term shall be pronounced. Rebels are considered armed if one or more of them are found carrying any ostensible arm. Pocket knives in the hands of rebels are considered to be arms.

It is singular that in our Merchant Shipping Act, which from Articles 239 to 290, professes to treat on the subject of discipline, no such word as *mutiny*, *revolt*, or *rebellion* is there to be found. These serious nautical crimes are therefore left, as formerly, to the common law, which has ever protected commanders of ships in the honest execution of their duty, when their conduct has not been tainted by harshness or tyranny, and when they have consulted the opinions of their officers before taking any serious measures. But the common law entails expences if a commander is brought forward, and owners or companies have rarely the public spirit to support officers through difficulties incurred in their service, which they are morally bound to do.

Although, with the exception of Americans, British seamen are considered to require stricter laws to keep them in order than foreigners, yet they have certainly this good quality among others, that any armed attack upon their officers as here contemplated by the French Art. 95, is extremely rare. I cannot call to mind but one instance, where, about twenty years since, a commander of a ship was driven to the necessity of shooting one of his men in self-defence, and for which he was tried and acquitted, it being considered justifiable homicide. But the plan pursued by crews of disaffected ships has been of late years the act of *striking work* at sea, in order to enforce unreasonable demands; the following instance of which is related as it occurred a few years since.

A ship of about 600 tons, with a crew of sixteen men before the mast, and homeward bound, took on board two more able seamen, who proved to be very bad characters. All had gone on smoothly until these hands were shipped, who, after being at sea a short time, put it into the heads of the crew that they had not grog enough, and they induced them to go aft in a body to demand more grog. The captain and officers met them on the quarter-deck, mildly remonstrated with them, and ordered them forward; and considering they meant to intimidate, positively refused to increase the allowance of grog, which was as much as customary in well ordered ships. The men threatened and swore they would never do another stroke of work as long as they were in the ship. The captain, officers, passengers, and servants, muster thirteen persons; the few firearms are in the cabin, also most of the provisions; every precaution for defence is taken, but the captain takes no forcible measures to reduce the crew, though far from land or any hope of assistance, unless they fall in with a man-of-war, which is improbable.

The officers and passengers shorten sail and continue to work the ship as well as they can towards England. This state of affairs goes on above a fortnight, and the two extreme ends of the ship remain in a state of blockade, no attack taking place on either side. At last, the provisions becoming short forward, the crew began to get dissatisfied with each other, and made overtures for a reconciliation; but found that no terms would be listened to without the unconditional surrender of the two bad characters who originated the whole business. This, after some delay, was acceded to, and they delivered up their leaders, who were put in irons, and landed prisoners at Plymouth: the rest of the men returning to their duty were forgiven. What became of these two men does not appear,—but they certainly were not punished as they deserved.

When a commander is thrown on the protection of the common law in these extreme cases, a proper professional man should be employed, for the English law is even stronger than the French in such cases, although the expences attending it often prevent their being brought forward at all, and many thereby escape. When a commander has not committed himself by any harshness or tyranny, and has deliberately consulted his officers and passengers, and so strengthened his case, a jury of Englishmen will rarely fail to protect him in the honest execution of his duty. In the *Laws of Shipping and Insurance*, by James Lees, Esq., author of *Shipmaster's Manual*, published in London by C. Wilson, late Norie & Co., 1853, the following Acts, still in force, are quoted. Page 131. "But nothing in the Mercantile Marine Act takes away or abridges any power which a master has over his crew (sec. 78). These powers of the master are chiefly exercised in the infliction of personal punishment or chastisement for drunkenness, disorderly behaviour, disobedience to commands, or *mutiny*, and in this respect these powers have been considered as analogous to those of a parent over his child, or a master over his scholar or apprentice. Upon the same grounds of necessity and sound discretion, he has au-

thority over all on board, and every one is bound to obey his lawful commands in every matter relating to the management of the ship and for the preservation of good order and discipline on board. (Abbot 172, Holt 287.)" Again, (page 132,) "The master should, however, be careful to exercise these powers in a reasonable manner, and with the advice of those next him in command."

Those who are desirous of obtaining more information on these matters, should read the trial of the mutineers of the *Inglis*, which occurred some twenty-five years since, and I would refer them to a most able speech then made by the present Dr. Lushington, the Judge of the Admiralty Court, who is without exception one of the most enlightened judges upon nautical subjects we ever had, and whose opinions will always be a guide as to precedents for professional men who have to conduct such cases.

By Art. 96, every plot or attempt against the safety, liberty, or authority of the captain, master, or commanding officer, is punished by close confinement.

This offence not being alluded to in the Merchant Shipping Act, is also amenable to the common law, which considers it an act of piracy, and the Crown would most probably become the prosecutor if brought to a regular trial. Such cases have occurred as vessels being met with in which the commander is a prisoner in the hands of the crew, who have taken command of the ship. In this case, a man-of-war could send them into port and deliver them over to the authorities as pirates.

Art. 99, In case of mutiny or revolt, the resistance of the captain and such persons as remain faithful to him, is considered an act of legitimate defence.

Although we have no law expressed in these concise terms to protect a commander when lives have been lost in recovering the command of his ship, yet precedents are always a guide in our civil courts, and where a commander has been driven to the desperate alternative of recovering the command of his ship by force of arms, and where he has not brought on the mutiny by any harshness, improper or tyrannical conduct, there is no instance on record in which a jury has not carried him clear through the difficulty. Whatever measures however are adopted, they should be undertaken by the deliberate opinion of the officers and passengers as to the absolute necessity for them, and entered accordingly in the log.

Art. 101, All regulations contrary to those of the present decree, are hereby abrogated and repealed.

The French Code so far differs from our Merchant Shipping Act that the latter does not repeal any former Acts relating to discipline, neither does it abridge any powers of a commander previously existing by the common law.

In taking leave of the *Décret Disciplinaire*, it is but justice to the memory of M. Ducos to say that others besides his countrymen fully appreciate the high sense of patriotism which he has displayed in making the details of that service over which he presided the object of

his most anxious solicitude; and in considering the articles no one can fail to observe that brevity, clearness, and conciseness which always indicate the master hand. In his admirable letter to the Prince President, urging the necessity for the adoption of special laws for the merchant marine, he says,—"And yet on board of a merchant ship equally as on board a ship of the State, the lives of the crew and passengers depend on the prompt performance of certain manœuvres, in the ready obedience to orders, and on the absolute submission to him who commands; public law therefore must not leave unpunished offences by which are compromised the fortunes and the lives of citizens."

To illustrate the truth of the above as applicable to our merchant service, it is only necessary to advert to the prodigious amount of life and property entrusted to the charge of the commander of a merchant ship, we will name, for instance, the *Pera*, which the underwriters well know went out some months since to the Mediterranean with specie alone to the value of £1,200,000. Now this vessel in actual money value was worth more than fourteen ships of the line; but what sort of a law have we to protect the person of the individual in charge of this enormous property? He may be knocked down on his own deck by one of his crew, who, according to our Merchant Shipping Act, is only liable to a penalty of three months' imprisonment, which, in fact, is so far from being any punishment at all, that, if the culprit went to such a comfortable jail as that of Maidstone, he would have far better times of it than serving, for that term on board some of our leaky, overloaded, and undermanned merchant ships, and yet this very act might under circumstances occasion the loss of the ship. It may be interesting here to draw a comparison as to the punishment for assaulting officers: first, by our own Merchant Shipping Act; then by the French merchant code, and, lastly, by our own Navy; not that we consider it necessary to make the laws in the merchant service in any way so strict as those of the Navy, but for all the requisite purposes of obedience to orders, and for the safety of life and property they should be essentially so. We will take the following case, and refer to the punishment awarded for it by the three maritime codes.

Assault on Officers.

The Merchant Shipping Act, page 938.

For assaulting any master, mate, &c., [the offender] shall be liable to imprisonment for any period not exceeding twelve weeks with or without hard labour.

French Merchant Code.

Art. 63. Every person guilty of assaulting the captain or an officer of the ship, shall be punished by an imprisonment of three months to three years, to which a fine of 24 to 300 francs may be added; if the assault be the cause of illness or incapacity from work for more than thirty days, the offender shall be punished conformably to Art. 309 of the Penal Code.

British Navy (Articles of War).

Art. 22. If any officer, mariner, or soldier, or other person in the fleet, shall strike any of his superior officers, or draw or offer to draw or lift up any weapon against him, being in the execution of his office, on any pretence whatsoever, every such person being convicted of any such offence by sentence of a court martial, shall suffer death or such other punishment as the nature and degree of the offence shall be found to deserve.

The various police reports which have lately appeared, more particularly from Liverpool, where so many Americans are congregated, show the absolute necessity of an extensive revision of the disciplinary portion of the Merchant Shipping Act, unless we are content to allow mutiny and piracy, with all the consequent danger to life and property, to continue in its present state of impunity. In the case of the *J. J. Birt*, as reported by the *Daily News* of December 30th, a regular armed mutiny occurred; but to suit the convenience of the commander it ended as a mere case of assault. In another case, at Grenock, (the *Raritan,)* in a gross case of mutiny the police magistrate laments his inability to inflict no more punishment than the three months' imprisonment named by the Act.

Maritime courts could inquire into and lay bare the *origin* of these mutinies, and see if any justification exists. Full often they arise from undermanning on first starting off to sea, a state of things which can only be remedied by the establishment and enforcing the observance of a proper scale of manning; for when vessels are really undermanned, the crew have no remedy but in the mischievous practice of striking work, which may lead to such proceedings as the above. When in harbour, this may not be attended with any particular danger, as the police are always at hand; but if this practice becomes common at *sea*, it may lead to consequences which may often involve the loss of a ship.

The remarks of M. Ducos, made in 1852, in his letter to the present Emperor as to the state of the French merchant marine, exactly apply to ours in 1858. He writes thus:—

"At sea the slightest fault is important on account of the fatal consequences which may arise from it. If it be not corrected at once the punishment is delusive, in fact worse, for insubordination is thereby encouraged; and hence the inefficiency of tardy judicial proceedings before the ordinary tribunals for acts which have most frequently occurred at remote distances, perhaps in foreign roadsteads, and nearly always without the power of producing witnesses." Again—"In the midst of this disastrous state of things your government, Monseigneur, cannot remain indifferent with the power of renovating an unsound legislation, and of grappling with the numerous deformities which it presents. Maritime commerce, which has already waited long and which relies principally on your high spirit of justice, looks to your government for the removal of those evils by which it is afflicted."

These are words of honest desire to remove an evil state of things by the establishment of an excellent code of maritime laws, and no doubt an equally high spirit of justice also prevails in our legislature. But where *maritime* affairs are concerned how few men are there in power who from their own personal experience can *feel* the necessity of looking into the serious and dangerous defects of our merchant shipping system! Unless a man has been at sea and knows as a seaman the dangerous emergencies to which a ship is subject, risking the very lives in his charge, he never can be convinced of the vital necessity that there is for order and discipline on board a ship. When we refer to the list of Members of Parliament for our seaports, how few do we see who can speak a word on any nautical subject from their own experience,—even naval officers are scarce in Parliament.

It is too evident that shipowners do not exert themselves as the French shipowners did to obtain proper maritime laws, principally because, unless they have been themselves at sea, they are not aware of the destruction going forward in their property from want of discipline. They know nothing of their sails blown away in consequence of sheer laziness, or how their spars are carried away from the careless method of their crews setting about their work; how anchors and cables are left behind and lost under the pretext of a head sea,—which losses the slightest exertion might have prevented; how ships run down channel with all sail set at night, in dark, squally, boisterous weather, with the look-out men smoking in the galley, running over other craft in their way that are beating up, and causing capital work for the lawyers and a capital sway upon the pockets of owners or underwriters, who are too content to shut their eyes and ears to all trouble about these things and take care to secure themselves from actual loss by the glorious system of marine insurance! Bnt who suffers? The British public of course:—first, financially, for every ship that is lost affects market prices; and next, morally, for the country is disgraced by such losses, arising from the bad discipline of her merchant seamen!

Although the petition to Parliament from the officers of the mercantile marine, emanating from Southampton, has omitted the material grievance of defective laws for the merchant service in respect to the maintenance of discipline, yet it is entitled to the strenuous support not only of every one connected with shipping or representing seaports, but also of the naval officers who are in Parliament. The large steam-vessels are not so much affected by these laws as those ships which have to get through the long and tedious voyages to India, China, or Australia, where the officers are left entirely to their own resources as to managing their crews, being for months absent from any port. No doubt, should any nautical enquiry take place on this subject, those officers could supply much important information; and in considering that part of the petition relating to the pensioning of merchant seamen, much benefit might be secured for the navy by making a servitude of five years in H.M. service afloat one of the

conditions of pension to the merchant seaman; so that every good hand anxious to secure himself a pension at the end of his sea service, being a British subject, would volunteer for the navy at some period of that service, and after a combined servitude of twenty-one years, including both services, he should then be entitled to the same pension as if the whole had been in the navy.

The ready manner in which merchant seamen can be made available for the navy is now well exemplified in Captain Peel's despatches* from India, which abundantly show that they want nothing but dis-

**Between Cawnpore and Lucknow, Nov. 9th, 1857.*

Sir,—On the 20th ult. Lieutenant Vaughan joined me at Allahabad with a reinforcement of 126 officers and men, which raised the total strength of the *Shannon's* brigade at Allahabad to 516. This reinforcement was composed for the most part of merchant seamen raised at Calcutta, and the fine appearance of the men, their good behaviour, and excellent discipline displayed the ability and zeal of Lieutenat James W. Vaughan. I beg to recommend this excellent officer to your favourable notice. I think, also, that it showed the fine spirit of the merchant service, as these men entered on board the *Shannon* without any conditions, and against £6 per month wages offered by the shipping.

On the 23rd ult., in obedience to a telegram from the Chief of the Staff, I sent a party of 100 seamen, consisting of Lieutenant Nowell Salmon's company of small arm men and a field-piece party, the whole under the command of Lieutenant Vaughan, to proceed with four siege train 24-pounders to Cawnpore. That party is now with the column before Lucknow.

On the 27th ult. a further detachment of 170 men, under the command of Lieutenant Thomas J. Young, the gunnery-officer of the *Shannon*, consisting of Lieutenant Edward Hay's company of small arm men, a field-piece party, and the marines under Captain Thomas C. Grey, with a siege train of four 24-pounders and two 8-inch howitzers, and a large amount of ammunition, under convoy of troops, was sent on the same service, and on the following day, by order of the Commander-in-Chief, I was sent to accompany it. Lieutenant-Colonel Powell, with the head-quarters of the 53rd Regiment, soon afterwards joined us on the march, and the battle that ensued at Kudjwa, the defeat of the enemy, and the death of the gallant Colonel Powell, are reported in the accompanying copy of my despatch to the Chief of the Staff. I have since been informed that the commander of the rebel army was also among the slain.

Since that battle was fought, with the exception of one day's rest for the footsore men, who had marched seventy-two miles in three days, besides fighting a severe engagement, we have made daily marches, and are now on our way to join the column before Lucknow.

At Cawnpore I was obliged to leave Lieutenant Hay with fifty men, to serve as artillerymen for that important position.

The remainder of my brigade, consisting of nearly 240 officers and men, are at Allahabad, under the command of Lieutenant Wm. C. F. Wilson, assisted by Lieutenants Henry R. Wratislaw and Lind ap Hazely (Swedish navy). They are doing duty at the garrison.

I am much gratified with the conduct of all the brigade, and there is no departure whatever from the ordinary rules and custom of the service.

I have, &c.,

WILLIAM PEEL, *Captain R.N.*

Rear-Admiral Sir Michael Seymour, K.C.B., &c.

cipline. That such men should have no hold upon the country in old age or helplessness is not creditable to this country as a maritime nation. Naval officers in Parliament are morally bound to look to this question, for although they may not have to go to sea again, unless something is done to better the condition of this class of men and to limit the employment of foreigners in our maritime service generally, in another naval war their successors will have to do their work with a very different set of hands from those who fought in the naval battles of the long war, or who, at Algiers, manned the guns of the *Queen Charlotte* and the *Impregnable*.

THE DESTRUCTIVE AGENCY OF LIGHTNING.—No. III.—*Remarkable Instances in which Ships and Vessels of various kinds have been Burned or otherwise Destroyed by the Electrical Discharge.*

In the two preceding papers we have placed on record in chronological order certain remarkable instances in which magazines, sacred edifices, and other public buildings have fallen a sacrifice to the electrical discharge. It remains now to record in a similar order certain other remarkable instances in which ships and vessels generally have been burned or otherwise set on fire and wrecked and destroyed by the electrical discharge. Such instances are more numerous and appalling than the instances given of the destruction of buildings on shore.

1746.—A Dutch merchant ship blown up by lightning in the roads at Batavia; name unknown.

1766.—The French frigate *Modeste* set on fire by the electrical discharge and completely destroyed.

1789, *Sept.* 11*th*.—East Indies: a merchant vessel, laden with gunpowder, in company with H.M.S. *Perseverance*, struck by lightning and blown up. The *Perseverance* also struck and damaged.

1798, *June* 14*th*.—Straits of Banca: H.M.S. *Resistance*, 44 guns, blew up. Stated by the survivors to have been struck by lightning.

1814, *July*.—H.M.S. *Peacock* disappeared in a furious storm of lightning. Supposed to have blown up.

1820, *January*.—Ship *Tanjore*, of 600 tons, burned by lightning off Ceylon.

1824, *April* 22*nd*.—Ship *Hannibal* struck by lightning on her passage from Hampton to Liverpool. Set on fire and totally destroyed.

1830.—Ship *Boston* burned at sea by lightning.

1830.—Barque *Bolivar* also struck at sea and burned.

1832, *December*.—Brig *Logan* also burned at sea by lightning. had on board 75,000 dollars.

1835, *June*.—Ship *Sir Walter Scott*, 650 tons, set on fire by lightning in the Bay of Biscay, and totally destroyed within an hour.

1838, *January.*—Barque *Ruthelia* struck at sea and burned.

1838, *January.*—Barque *Lydia* burned also at sea by lightning.

1840, *May* 16*th.*—Ship *Poland*, Nantucky Shoals. Lightning struck the foremast and set fire to the hull. Ship totally consumed after burning three days. Had on board thirty-five passengers.

1841, *November.*—Ship *Sultana*, 600 tons, struck in the China Seas. Set on fire and totally destroyed.

1845, *November* 25*th.*—Ship *Bayfield*, of Liverpool, 400 tons. Sierra Leone: set on fire by lightning and burned.

1846, *July* 3*rd.*—Brig *Columbia* destroyed by lightning off Belize. All hands perished except the captain.

1846, *September* 17*th.*—Brig *Oscar* destroyed by lightning at Port Spain.

1846, *November* 29*th.*—Ship *Thomas Cope*, 800 tons, American liner, burned at sea by lightning.

1847, *February* 11*th.*—Ship *Christopher Columbus* struck off the Havana and consumed.

1847, *June* 14*th.*—Ship *Columbia* struck off Cape Henry and sunk.

1847, *December.*—Ship *Robert Shaw;* lightning set fire to the vessel off Ushant; abandoned in a burning state: went down off Portland.

1848, *April* 18*th.*—The *Fisher*, brigantine, destroyed by lightning off the high lands of Neversink.

1848, *July* 1*st.*—The pilot boat *Four Sisters*, sunk by lightning off Sands Head.

1848, *July.*—A brig, name unknown, struck by lightning off Boulogne, and consumed within sight of the coast.

1848, *July* 29*th.*—A flat boat, name unknown, sunk by a stroke of lightning in the Mississipi.

1849, *April* 30*th.*—Sloop *George and Mary*, struck off Scarborough, set on fire and destroyed within three hours.

1850, *March* 4*th.*—Brig *Lincoln*, struck at sea and sunk.

1850, *December* 11*th.*—Ship *John Bryant*, 700 tons, struck off Cape Clear, and set on fire; ship eventually burned, scuttled and sunk at Dublin.

1852, *August.*—Ship *Maise*, sunk by lightning off Malta; nearly all perished.

1853, *February* 22*nd.*—The fine new ship *Golden Light*, 600 tons, struck on coast of America, and totally destroyed by fire: insured in £60,000.

1853, *April* 9*th.*—Ship *Alciope*, 400 tons, struck at sea and totally destroyed: from Calcutta to London with a valuable cargo.

1853, *May* 10*th.*—Sloop *Delaware*, in the Mississipi: a stroke of lightning fell on the vessel, and she immediately went down.

1853, *July.*—The brig *Mary*, totally consumed at Sierra Leone.

1854, *August* 3*rd.*—Brig *Jonnaes*, off the Scaw, struck, set on fire, totally consumed.

1855, *December.*—Schooner *Alma*, reported to have been blown up by lightning at Malacca.

1856, *June 16th.*—Ship *Ben Avon*, 600 tons, struck by lightning off Amoy, and finally lost in consequence.

1857, *November 3rd.*—Ship *Howadge*, first class ship, 695 tons, from Boston to Liverpool, struck by lightning at sea and burned.

The circumstances attendant on these several cases, are of the most appalling kind. The *Bayfield*, ship of 400 tons, struck by lightning off Sierra Leone, beside being set on fire, appears to have been shook through all her timbers. Large splinters from the spars strewed the deck. The master and crew were for a time struck senseless. In a few minutes the ship was in a blaze fore and aft, and the vessel totally destroyed. The master and crew got away in the boats, and reached Sierra Leone after intense suffering.

The burning of the *Sir Walter Scott* is described in the *Annual Register* for 1835. Lightning shivered the foremast and completely raked the vessel; and so completely set fire to the cargo that the captain, crew, and passengers, roused from their beds, hurried into the boats, and within an hour the ship went down. "The moment the long boat and the gig left the vessel, the masts went over the side, the flames shot forth in volumes, the thunder still roared, the lightning flashed vividly in the air, and the two small boats were speedily left alone upon the billows." After intense suffering during the following day and succeeding night, they were fortunately picked up by the ship *Saladin*.

The frequent occurrence of such cases renders it extremely probable that many ships reported as missing, and which have disappeared, have fallen victims to the electrical discharge. Scarcely a year has passed without records of ships burned and destroyed by lightning, so as to leave little doubt on the mind of an equally frequent occurrence in past years, could all the cases be ascertained and collected.

A great peculiarity may be observed in cases of ships set on fire by lightning, viz., a rapid spreading of the fire in every part of the vessel, as if the electrical agency had so pervaded the mass as to render the extinction of the fire by artificial means impossible. In the case of the sloop *George and Mary*, the discharge described as "a ball of fire," entered the cabin and the whole of the stern of the vessel was instantly in flames, and although every effort was made to suppress the fire, it was found impossible; so rapidly did the fire spread, that the master and crew were unable to save their clothes. A similar result may be observed in the cases of the *Bayfield* and *Sir Walter Scott*, and in other equally lamentable instances of the destructive agency of lightning at sea.

6, *Windsor Villas*, *10th January*, 1857.

A Lighthouse Tour of Lake Superior.—*By Captain Mackinnon, R.N.*

(Continued from page 10.)

Thirty large masses of native copper were lying on the wharf waiting for shipment. Selecting six of these, the most convenient to examine, we noted the weight as follows:—65 cwt. 50 lbs.; 74 cwt.; 41 cwt. 60 lbs.; 43 cwt. 35 lbs.; 16 cwt. 50 lbs.; 66 cwt. These fine specimens varied from 70 to 95 per cent. of pure metal.

We were rewarded for a walk of a mile up a steep hill, by seeing several incipient shafts, just commenced. As we continued our way, cursorily examining the loose earth thrown up by the operation of ditching the sides of the road, numerous small pieces of copper were observed lying about, varying in size from something above a pin's head to an ounce in weight. A careful examination would no doubt prove remunerative.

As we were thus engaged, an explosion, somewhere near us, attracted our attention; and turning aside, several men were seen engaged in sinking a shaft. It appeared on inquiry that they had been at this work about two months, and had actually excavated about twenty feet into the bowels of the earth! No great depth was this certainly, yet it was sufficient to undermine the trap rock and expose to the light of day the vein-stone, intersected, in all directions, with copper, presenting a curious appearance! Here were small knobs of virgin copper half exposed; there again were layers squeezed flat like paper; then there were rough and shapeless nuggets; peas, beans, and, in fact, every imaginable fantastic form!

It is easy to make acquaintance in a new country, and we were very soon engaged in confidential conversation with the intelligent foreman of the works,—an Englishman from Nottingham,—who informed us that the average yield was 14 per cent.; that silver is constantly found imbedded in the masses; and several instances of "junks," exceeding seven pounds in weight, have been discovered. We soon learnt from our very civil new friend that this mine was paying its way satisfactorily; and he was glad to tell us the important fact that his wife had joined him from England, after three years' separation. This information was imparted to us with evident satisfaction; but our curiosity was rather directed to the specimens with which he presented us; so, congratulating him on his happiness, we continued our walk in search of other information.

Labour to any extent may be procured in the mineral districts; but with few exceptions the workmen dissipate their earnings recklessly. Large sums have been secured by speculation, which after all is mere gambling. The imagination is strongly excited by the strangely shaped prodigious masses of pure mineral; and thus the desire for

sudden gain has directed an enormous amount of speculation to Lake Superior.

There are more mines at work here, remarkable for being ill chose, than for being productive. In fact, to insure success requires more time, capital, and judgment, than is generally to be found. Many mines, hastily opened, are as hastily abandoned, when a more judicious and careful course might have turned out profitable. Still, under more favourable circumstances many thus forsaken mines will hereafter be reopened by cautious adventurers, who will no doubt reap a rich harvest from previous outlay.

The next point in our tour was Ontonogon,—the heart of the minerals,—from whence large exports are made.

On reaching the wharf, a collection, consisting of forty large pieces of native copper, and fifty barrels more of it from Adventure mine, first attracted our notice.

A chance selection of eight pieces, gave the following results:—5,580, 3,661, 4,843, 4,157, 298, 5,990, 500, 527 hundred weights each, 70 per cent. pure copper. The shape of these specimens were quite different from those previously remarked. They were irregular in shape, jagged, and angular; curious legs extended outwards, as if the fused metal had been forced through these legs into moulds.

The mine now before us is *par excellence* the great mine of Lake Superior. So enormous are the results obtained from it that they seem fabulous, and it is not surprising that a *furore* has been created all over the world to follow the enterprising example and strive for similar results.

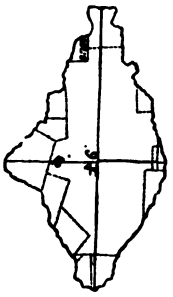
The Minnesota mine, the most celebrated in the world, at this time, August, 1857, stands as follows:—

Cost (total) to Stockholders, dollars 66,000, equal to £13,200.
Shares at present prices, each doll. 175. In all dollars 3,500,000 equal to £700,000.

	Doll.	£.
There has been set off from the original location and distributed to the stockholders, five other mines, the stock of which is worth at current rates	1,300,000	260,000
The Minnesota mine has made four dividends, amounting to.....	680,000	136,000
Total returns of value to the original stockholders..	5,480,000	1,096,000
Deducting the original outlay.....	66,000	13,200
There remains the prodigious clear profits as follows	5,414,000	1,082,800

This marvellous unheard of profit, is the true source of the feverish excitement and rapid progress of Lake Superior.

The Minnesota contains at this moment the most extraordinary mass of metal in the world. The following particulars obtained with some difficulty, may be relied on.



The huge mass represented in the sketch was discovered in February, 1857. The vein of contact, close to which this mass lay concealed, was situated between conglomerate and overlying trap. In exploring this vein the miners had nearly passed a joint or protuberance which barely extended into the vein. Fortunately it did not escape observation, but was thought to be a small detached piece. On following this protuberance it led to this monstrous mass.

The length is 46 feet; breadth, 18 feet; greatest thickness, 8 feet 2 inches. Its weight is calculated to be something under 500 tons. 200 tons—90 per cent of copper—have been already cut off in pieces varying from 2¼ to 4 tons. Forty men have been employed cutting it into transportable pieces, and it is calculated that the same force will be required for six months more to hew it into marketable pieces.

It appears that Cornish men have entire charge of this Herculean labour. Their process consists in one skilful man directing a long cold chisel in a slanting position. Two others, with the heaviest hammers, continually strike the chisel, which is guided so as to cut out a narrow ribbon. The groove once commenced is steadily continued until the huge junk of copper is separated and ready for removal.* The ribbons or chips are packed in barrels, and already amount to nine tons!

When first the wondering miners laid bare a portion of this huge ingot it was reposing at an angle of 45°. After various ineffectual attempts to move it, they at last succeeded in raising the lower end by a charge containing 775lbs. of blasting powder.

This mine raised in 1856 1,864 tons of copper, the purity of which was 73 per cent. In 1857 it is calculated to take out 2,300 tons of a greater purity!

The total produce of copper from the mineral range is about 6,000 tons, about an average purity of 70 per cent.

The Ontonogon district contains a population of about 3,300; of which 1,200 reside in the town. There is no agricultural population. When the railway now in progress connects this part of Lake Superior with Lake Winnebago and the eastern seaboard, great prosperity may be reasonably looked for by those concerned in this mine. There does not appear to be any undue speculation in city making at this point, the choice city lots being held at about 700 dollars (£140), inferior down to 100 dollars (£40).

After our inspection of this interesting locality, at daylight on the following morning we anchored off Le Pointe Light, and, the visit of duty being over, we went to the little village of La Pointe. This is one of the oldest settlements in the country, dating back as far as

* See dotted lines on drawing, which show the cuttings.

1756. It is chiefly inhabited by half-breeds, and is supported by the fish and fur trades. On attempting to purchase live stock for our cabin table, we soon learnt that the few turkeys and geese that were wandering about had lately been imported for breeding from the South. A few farms are cultivated on this island, but not sufficient to supply the population.

Twelve miles South of La Pointe, in the magnificent harbour of Long Island Bay, is a great paper city called Asland. As we did not visit it we will not attempt any description further than that the situation is highly lauded by competent authority. Its population is said to be about 300 persons, and the city plot 160 acres!

As wood for fuel was scarce, the steamer was moved over the bay to the mainland, and secured to the wharf of the magnificent—on paper—city of Bayfield. We insert a description of this city, taken from the map, on which is carefully marked out 2,720 lots, which may be bought from 500 dollars (£100) to 100 dollars (£20):—

"*Remarks.*—This city is situated on the southern shore of Lake Superior, in Le Point County, Wisconsin, abont eighty miles East of the town of Superior, and directly opposite La Pointe on Maddaline Island, from which it is separated by a channel two miles wide, with an average depth of sixty feet. This channel is so inclosed by a group of islands—the Apostles—that it is protected from winds in all directions, making it one of the safest and most commodious harbours in the world, &c.

"The surface upon which the town stands is most admirably adapted to health, convenience, and beauty, &c.

"The grounds are so laid out that *all* the avenues and ten of the eighteen streets terminate on the bay, &c."

So much for one side of the story, now for the other. This city of Bayfield has no single present advantage to make the land on which it stands worth a cent an acre. There is not a single person employed solely in agricultural pursuits in the county, and yet a body of 400 persons have been induced to erect substantial houses, wharfs, &c., and establish a weekly paper—the *Bayfield Mercury*. It is no risk of opinion to prognosticate that ten years hence, if not deserted, it will not contain half its present population. Even should it contain so many they will have to seek a precarious living by fishing and lumbering. But let us analyze this paper city and reduce it to actual fact:—There are 140 blocks, containing 2,720 lots and covering an area of nearly a square mile. Take the minimum price asked for these lots—namely 100 dollars (£20)—and it appears that the proprietors actually demand for this densely wooded, sandy soil a money value equivalent to 272,000 dollars (£54,200) if they were to realise the full price named, five times this large sum. What adds to the absurdity of the case is the fact that of the square mile (640 acres) on which this paper city reposes in solemn and primeval solitude, there is not fifty acres cleared,—thus increasing the expense of the unfortunate settlers—if any such are ever found—to nearly the prime cost of land. Truly, Brother Jonathan knows a thing or two, but it may

be well doubted if he will succeed in victimizing many more of his countrymen. It is right to say *many more* as it is currently reported that numerous sales of these lots have been effected in the eastern states.

In the afternoon we were favoured with a visit from the Chief of an Indian tribe of the Chippeways, Non-ga-nop, which, interpreted, means the Orator. His manner was dignified, such, indeed, as became his station, and he expressed through the interpreter his regret at not being able to converse in the English language. It was most interesting to us to see him take his departure in a birch-bark canoe loaded to the gunwale with all his household goods, including his squaw, four children, furniture, and two dogs, all of whom remained perfectly still, tightly packed amongst the goods and chattels, intently watching the steamer. This chief is a very influential personage amongst the wild men of Lake Superior, and had lately been the instrument in concluding a treaty with the United States Government for the sale of vast tracts of mineral lands.

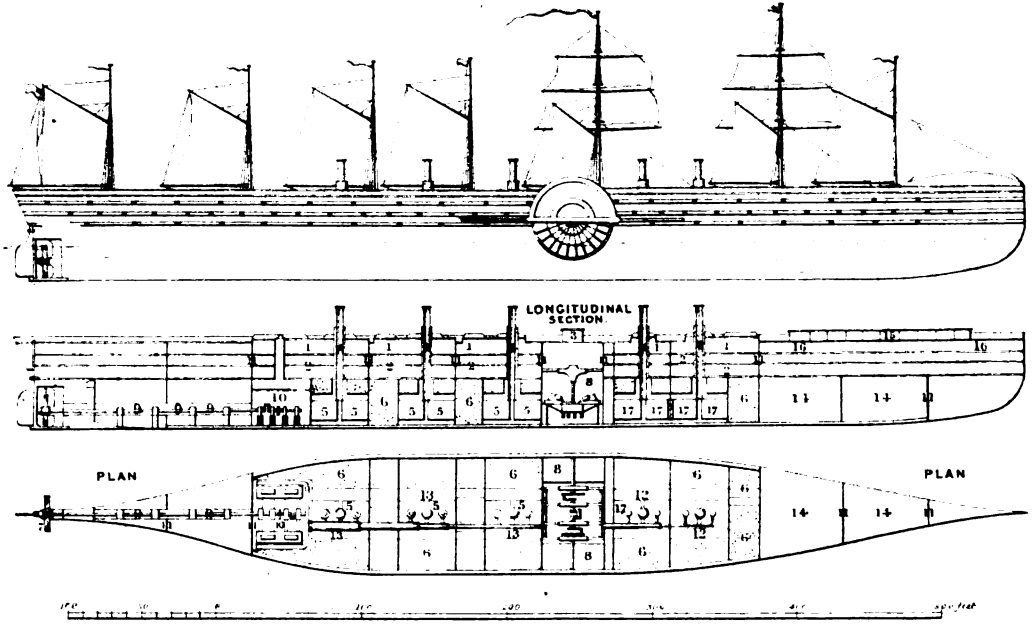
Two young Canadian ladies also came on board here to take a passage to Superior city. They joined our bachelor party in the saloon during the evening, and commenced a steady gallop in rocking chairs whilst intently watching us. Three of the party left the saloon, leaving "the General"—a confirmed bachelor—alone. No sooner did this happen than the youngest stopped her gallop and addressed the General, with an insinuating smile, as follows:—"General, How do you sell your candy?" This attack entirely upset the General's gravity, who could not contain himself. The Canadian appeared considerably astonished and started off again in full career. She appeared to think that the *Michigan* contained a cabin full of candy.

Towards sunset, having concluded our business, the vessel's head was turned West and we carefully threaded our way amongst the numerous islands of the Apostles towards the city of Superior.

(To be continued.)

The Leviathan of the Thames.

At length there seem to be fair hopes, before these lines go forth to the world, of seeing the *Leviathan* actually in her own element, where she is to realise one of the greatest experiments perhaps, both commercial and nautical, that has ever been made by this country. We may, therefore, venture to allude to her as a great *fait accompli*, and now add our wishes to those of her owners, projector, and builder that all their anticipations may be verified. As to expressing any opinion on the result of the experiment commercially, we have no right to one; and nautically, although we might look at her with



THE STEAM SHIP LEVIATHAN.

some distrust in certain conditions, there are so many contingent *provisos* of nearly every kind to be considered, that we prefer waiting the result of the experiment itself as it is so near at hand. Besides, it will be safe to suspend our judgment, especially since nautical men are divided on the subject. We will therefore hope for the best and that she will be found to answer her helm in a gale on the ocean as readily as she may answer the mercantile intentions of her projectors, without falling into the trough of those seas of which perhaps she will make nothing, but which it is the care of her less pretending brothers and sisters afloat carefully to avoid.

For the present we shall content ourselves with giving the following account of her from the Report of the British Association, along with those particulars relating to her enormous size that at the present moment are so interesting.

Mechanical Structure of the "Leviathan" Steam-Ship.—By John Scott Russell.

Mr. Russell laid before the section some of the mechanical details of the construction of the great ship now building at his establishment at Millwall. The first point related to the peculiarity of her great size; the second, on which her merits or demerits as a piece of naval architecture depended, was the general structure or lines of the ship; the third point would be the distribution of materials in the construction of the ship, so as to obtain the safest and strongest possible structure with the minimum of materials; and the last point would be, to allude generally to the mechanical arrangements for her propulsion. With respect to size, it was generally supposed that, as a practical ship-builder, he was an advocate for big ships. The contrary, however, was the fact. There were cases in which big ships were good, and there were certain cases in which big ships were ruinous to their owners. In every case the smallest ship that would supply the convenience of trade was the right ship to build. He came there as an advocate of little ships; and it was the peculiarity of the *Great Eastern* that she was the smallest ship capable of doing the work she was intended to do; and he believed that if she answered the purpose for which she was designed, she would continue to be the smallest ship possible for her voyage. It was found by experience that no steam-ship could be worked profitably which was of less size than a ton to a mile of the voyage she was to perform, carrying her own coal. Thus, a ship intended to ply between England and America would not pay permanently unless she were of 2,500 or 3,000 tons burden. In like manner, if a vessel were intended to go from this country to Australia or India, without coaling on going out, but taking her coals with her, she would require to be 13,000 tons burden. And turning to the case before them, it would be found that the big ship was a little short of the proper size. Her voyage to Australia and back would be 25,000 miles; her tonnage, therefore,

should be 25,000 tons, whereas its actual amount was 22,000 tons. The idea of making a ship large enough to carry her own coals for a voyage to Australia and back again was the idea of a man famous for large ideas—Mr. Brunel. He suggested the matter to him (Mr. Russell) as a practical shipbuilder, and the result was the monster vessel which he was about to describe.

He had peculiar pleasure in laying a description of the lines of the ship before the present meeting, because the ship as a naval structure, as far as her lines were concerned, was a child of that section of the British Association. It was twenty-two years since they had the pleasure of meeting together in Dublin. On that occasion he laid before the mechanical section a form of construction which had since become well known as the "wave line." The section received the idea so well that it appointed a committee to examine into the matter, with the intention, if they found the wave principle to be the true principle, to proclaim it to the world. The committee pursued its investigations, publishing the results in the account of their transactions; and from that time to the present he had continued to make large and small vessels on the wave principle; and the diffusion of this knowledge through the *Transactions of the British Association* had led to its almost universal adoption. Wherever they found a steam vessel with a high reputation for speed, economy of fuel, and good qualities at sea, he would undertake to say that they would find that she was constructed on the wave principle.

He would endeavour to explain what were the principles of the wave line as distinguished from the older fashioned modes of building, and how they were carried out in the big ship. All practical men knew that the first thing a shipbuilder had to think of was what was called the midship section of the vessel; that was, the section which would be made if the vessel were cut through the middle, and the spectator saw the cut portions. Mr. Russell here pointed out a diagram of the midship section of the *Wave*, a small vessel about 7½ tons burden, which was the first ever constructed upon that principle. Now the first thing to be done in building a steam vessel was to make a calculation of the size of the midship section in the water. In sailing from one place to another it was necessary to excavate a canal out of the water large enough to allow the whole body of the ship to pass through. The problem was, how to do that most economically; and this was effected by making the canal as narrow and as shallow as possible, so that there would be the smallest quantity of water possible to excavate. Therefore it was that the shipbuilder endeavoured to obtain as small a midship section as he could; and that had been effected in the case of the big ship, whose midship section was small,—not small absolutely, but small in proportion. In increasing the tonnage of a ship, three things had to be considered, the paying power, the propelling power, and the dimensions.

Mr. Russell then entered into a calculation to show that while he doubled the money-earning power of a ship by increasing its size, he only increased its midship section by 50 per cent. For instance, a

ship of 2,500 tons burden would have 500 feet of excavation through the water to do; the big ship had 2,000 feet of excavation: and the lineal dimensions of one were to the lineal dimensions of the other as 1 to 2·1. The excavation to be done by the big ship in relation to that to be done by the small ship was as 4 to 1, but the carrying power was as 10 to 1. To propel the big ship they had a nominal horse-power of 2,500, while to propel the smaller vessel there was a nominal horse-power of 500; so that the big ship would be worked quite as economically as the small one. Referring again to the wave line, he would suppose that it was given as a problem to any one to design a ship on the wave principle. The first thing to be done was to settle the speed at which the ship was intended to go. If the speed were fixed at 10 miles an hour, a reference to the table of the wave principle would show, that in order to effect that object the length of the ship's bows ought to be about 60 feet and that of her stern about 40 feet. If a larger vessel were required, say a ship of 130 feet long, there would be nothing more to do than to put a middle body of 30 feet in length between the bow and the stern. Having then made the width of the ship in accordance with the midship section agreed upon, it would be necessary to draw what was known as the wave line on both sides of the bow, and the wave line of the second order on both sides of the stern. Constructed in this manner, and propelled by the ordinary amount of horse-power, the ship would sail precisely 10 miles an hour. They could go slower than 10 miles an hour, if necessary, and in doing so they would economise fuel, in consequence of the diminished resistance of the water; whereas there would be a vastly increased resistance if an attempt were made to drive the steamer more than 10 miles an hour.

For the speed at which it was intended to drive the *Great Eastern* it was found that the length of her bow should be 330 feet, the length of her stern 230 feet, of the middle body 120 feet, and of the screw propeller 10 feet: making in all 680 feet in length. The lines on which she was constructed were neither more nor less than an extended copy of the lines of all the ships which he had built since he first laid the wave principle before that Association. It was his pride that he had not put a single experiment or novelty into the structure of the vessel, with one or two exceptions, which he had adopted on the recommendation of men who had had practical experience of their efficacy. The wave principle had never in a single instance deceived him as to the exact shape a vessel ought to be in order to accomplish a certain rate of speed, and he had therefore adopted it in the construction of the big ship.

He would next refer to the mechanical construction of the big ship, the arrangement of the iron of which she was made, and the object of those arrangements. It was much to be desired that our mechanical science should make progress by the simple adoption of what was best, come from where it might; but he was sorry to say that iron shipbuilding did not grow in that manner. They commenced by servilely imitating the construction of wooden ships, thereby incurring a

great deal of unnecessary labour and expence. There was this great difference between the strength of iron and of wood, that whilst the latter was weak crossways and strong lengthways, or with the grain of the timber, iron was almost equally strong either way. This had been clearly ascertained by experiments made by Mr. Fairbairn and Mr. M. Hodgkinson, at the request of the British Association, in whose *Transactions* the results were published to the world. The consequence was, that the ribs or frames used to strengthen wooden ships were rendered unnecessary in iron ship-building; and acting on this principle, the *Wave* (in the construction of which he was assisted by two Irishmen) was built of iron entirely, with bulkheads, and had not a frame in her from one end to the other. He was ashamed to say that he did not always practice what he preached. He was compelled against his will, by the persons for whom he built, to pursue the old system; besides which there were laws of trade, Acts of Parliament, and Lloyd's rule, to which he was obliged to conform. Thus, if he did not put a certain number of frames in the ship, a black mark would be put upon her, and she would not be allowed to go to sea. But whenever he was allowed to build according to his judgment, he built in what he considered to be the best way. And he believed that in what he was now placing before the section he was laying the grounds of meeting the British Association that day twenty years, and finding that the mode of mechanical construction which he proposed had been as universally adopted as the wave principle, because of the publications of the British Association.

Mr. Russell then proceeded to give an elaborate description of the old method of constructing an iron ship, contrasting it with the improved style which he pursued at present. Instead of the mass of wooden rubbish, which did not strengthen the ship, and involved enormous expense, he placed inside the iron shell as many complete bulkheads as the owner permitted him to do, and then constructed in the intermediate spaces partial bulkheads, or bulkheads in the centre of which holes had been cut for the purposes of stowage. The deck was strengthened by introducing pieces of angle iron, and other contrivances; and as an iron ship when weak was not weak crossways, but lengthways, he strengthened it in this direction by means of two longitudinal bulkheads; and the result was a strength and solidity which could not be obtained in any other way. The *Great Eastern* had all these improvements, and in addition the cellular system, so successfully applied in the Britannia Bridge, had been introduced all round the bottom and under the deck of the ship, giving the greatest amount of strength to resist crushing that could be procured. A great deal of alarm had been expressed by some persons as to the launching of the ship sideways; but these apprehensions were groundless. The ground sloped from where the vessel now stood at a steep incline of 1 in 12, and when the supports were withdrawn, if everything were in proper order, she must necessarily slide down safely into the water. As he had already observed, there was nothing new in the ship but her great size and cellular construction. It was true,

she would be propelled both by a screw and paddles, but there was no reason to doubt that they would work harmoniously. He wished he could tell them how fast she would go, but that was the secret of the owner of the ship.

Description of the "Great Eastern."

This immense vessel is the property of the Eastern Steam Navigation Company, incorporated by Royal Charter. The capital of the company is £1,200,000, in £20 shares, with power to increase the amount to £2,000,000 sterling.

The *Great Eastern* was designed by Isambard Kingdom Brunel, Esq., F.R.S. The ship and paddle engines are building by Messrs. Scott Russell and Co., at Millwall, Poplar; and the screw engines by Messrs. James Watt and Co., Soho Works, Birmingham.

The principal dimensions of the ship, her capacity, and power, are as follow:—

Length (rather more than the eighth of a mile)	680 feet.
Breadth	83 do.
Depth from deck to keel	60 do.
Length of principal saloons	400 do.
Number of decks	4
Tonnage	22,500 tons.
To carry coals and cargo	18,000 do.
Nominal power of paddle engines	1,000 horses.
Do. screw do.	1,600 do.
Number of cylinders of paddle engines	4
Diameter of cylinders	74 inches.
Length of stroke	14 ft. 6 in.
Draft of water (laden)	30 feet.
Do. (light)	20 do.
To carry 800 1st class, 2,000 2nd class, 1,200 3rd class	Total 4,000 Passengers.
„ Troops, without other passengers	10,000
Weight of iron used in construction, about	7,000 tons.

The speed of the vessel is estimated by Mr. Brunel at fifteen knots an hour, without diminution and without cessation, under any weather; a speed which would accomplish the voyage between England and India, by the Cape, in from thirty to thirty-three days; and between England and Australia, in from thirty-three to thirty-six days.

The mode proposed for launching the vessel is as follows:—In constructing the foundation of the floor on which the ship is being built, provision is made at two points to ensure sufficient strength to bear the whole weight of the ship when completed. At these two points, when the launching has to be effected, two cradles will be introduced, and the entire fabric will be lowered down gradually to low-water mark, whence, on the ensuing tide, the vessel will be floated off.

One peculiaity of this ship is that her deck will be flush, except for cabin entrances and similar purposes, so that her great length will afford the passengers a promenade of more than a quarter of a mile round the deck, which, from the magnitude of the vessel, ought to be at all times free from shipping water.

Intimately connected with the appearance of the ship, is her rig, and added thereto, her motive power. In no ship have the chances of accident been so much studied as in the *Great Eastern*. Her provision against such contingencies may be thus stated: 1, An inner and outer skin in compartments; 2, Water-tight bulk heads; 3, Ample masts and sails; 4, Paddle wheels; 5, Screw propeller.

With regard to motive power, the wind will be made available, and for this purpose the vessel will be provided with seven masts. The centre masts will be the principal; these will be crossed by yards, as in a line of battle ship; the other masts will be smaller in size. The sails will be of an effective but simple character.

It is, however, in respect of its steam power that this vessel will be most distinguished, combining, as it does, both the paddle wheel and the screw. The engines are incomparably larger than any hitherto made for marine purposes; and their *actual power* will be far greater than their nominal power already stated. They will be placed in different parts of the ship, and be entirely independent of each other. The vessel will have ten boilers and five funnels; and each boiler can be cut off from its neighbour, and used or not, as desired. The boilers will be placed longitudinally along the centre of the ship; and it will give some idea of their generative power, when it is stated that every boiler will have ten furnaces, thus giving to the whole no less than one hundred furnaces. The fuel to be used will be anthracite coal.

The paddle engines are direct acting, with oscillating cylinders, and are constructed on the disconnecting principle, in order that they may be used jointly or separately, so that both or either of the paddle wheels can be put in independent motion. The diameter of the paddle wheels will be sixty feet.

There are few points connected with a paddle wheel steamer more important than the diameter of the wheel; six inches, more or less, in many cases altogether changing the character of the vessel for speed. A consideration of the light and heavy draft of water of this ship will show the real difficulty in the way of the designer.

The vessel will draw ten feet less when light than when she is laden; and the great lift of water at the deepest immersion of the wheel is in itself an important consideration.

The screw propeller will be twenty-four feet in diameter; it will be placed at the stern of the vessel, and worked in the usual manner.

The best terms to describe the build is by stating that there is an inner and outer skin. The space between the outer and inner skin, or ship, is two feet ten inches. These skins are united to each other by longitudinal webs or girders formed of plate and angle iron. There

are seventeen of these webs on each side of the ship, which run the entire length of the vessel; and they are placed at such distances as to extend upwards, at intervals of about three feet, from the keel to the main deck; and they are again closed up in lengths varying from twenty to sixty ieet. Thus the outer and the inner ships are joined together by means of a great number of water-tight webs or cells of extraordinary strength, giving the vessel a rigidity such as has never been communicated to a ship before. The upper deck is treated in the same manner for a width of twenty feet on each side, and iron girders bind one side to the other, so that the entire vessel becomes as it were a beam of strength, and the whole fabric may be denominated a web of woven iron, the rivets forming the fastenings, and the webbed or honey-combed cells becoming an indissoluble structure. The web plates are of half-inch iron, and the outer and inner skins are of three-quarter-inch iron. The compartments between the outer and inner skin will hold 3,000 tons of water ballast, should it be required. The floor of the ship, as previously stated, is perfectly flat, the keel being turned inwards, and rivetted to the inner ship's keel. The bow and stern have additional strength imparted to them by strong iron decks at those parts.

The ship will have a number of large ports on the lower deck to receive railway waggons, carriages, and bulky goods. She has also sixty ports on each side, two feet six inches square, for ventilation; and an abundance of dead lights. The lower ports are ten feet above the water when the ship is loaded.

In addition to these safeguards outwardly, the vessel is divided transversely by ten separate water-tight bulkheads running up to the main deck, and these again are crossed by longitudinal bulk heads running fore and aft.

It may, therefore, be said that the ship consists inwardly of a great number of small cells, or water-tight compartments, between the outer and inner skins, and of a number of large square compartments in the body of the vessel. The cabins will be on the decks above these compartments, and will form large and splendid saloons. The captain and officers' berths will be placed on the upper deck.

References to Plan.

1. Upper Saloons.
2. Principal Saloons.
3. Captain's Room.
4. Funnels.
5. Boilers for Screw Engines.
6. Coal Bunkers.
7. Four-bladed Screw.
8. Paddle Engines.
9. Screw Shaft.
10. Screw Engines.
11. Cross Bulk-heads.
12. Steam Pipe from forward Boilers.
13. Steam Pipe from after Boilers.
14. Space for Cargo.
15. Officers' Rooms.
16. Berths for Crew.
17. Boilers for Paddle Engines

[The whole world is already aware of the failure of the launching statements in the foregoing.—Ed.]

Are the Goodwin Sands Magnetic?

January 14*th*, 1858.

Forewarned, Forearmed!—This is a very old saying and sometimes leads to a suspicion of imaginary dangers, and perhaps the subject of this paper may be of that class. Yet, as it has made a strong impression on my mind, it may induce others whom it more immediately concerns to watch, as opportunity may offer, the operations of cause and effect, and to give the maritime community the benefit of their observations.

Every year seems to increase the intercourse between the northern and southern hemispheres! Every year sends its additional quota of emigrants to and from, and through the intricate navigation of the narrow seas! Colossal steam-vessels touch at British ports and then pass on to the German cities, freighted with that before which all merchandise sinks into insignificance—namely, human life! Now, of all hazards the Goodwin Sands appear to claim the pre-eminence! The skilful pilot, the experienced navigator are, as well as the reckless and ignorant, ofttimes involved in its inextricable meshes! Who can doubt for a moment that the practical, careful, and long experienced commander of H.M. steam-packet *Violet* believed himself a wide berth clear of those awful dangers when, with all hands, he was instantaneously plunged into eternity? I ask then, Is it possible, nay, is it probable the compasses deceived him? Bear in mind she was an iron vessel and, according to recent discoveries, more liable to magnetic disturbance. I have spoken to masters who have unexpectedly got on the Goodwin and been obliged to abandon their vessels, and have often elicited a similar reply.—"Can't account for it, sir, unless our compasses were wrong!"

Now, it is a very curious fact that the majority of vessels lost on the Goodwin have been steering to the westward, and generally with a fair wind. They have in truth sailed on to the shoal, or, steering a steady course under steam, run directly upon it! Considering, then, that such compass course in these latitudes is also more liable to disturbance, it very naturally suggests the inquiry—Have the Goodwin Shoals any disturbing power which may affect the compasses of ships coasting along their edge, especially their steep S.E. face? I remember, some years ago, the Dutch East India ship *Cynthia* sailing on to the shoal in a fog, and when it cleared they could have thrown a stone against the iron cylinder beacon. The captain had previously attributed the accident to some error in the course unaccountable to him.

Let us now consider what an enormous amount of metal has been deposited upon that shoal during the last half century, especially since the introduction of chain cables, chain rigging, iron tanks, &c. Take the case of that fine East India ship *Ogle Castle*, with all her guns, shot, anchors, chain cables, &c., wrecked on the outer face of the sand. Nothing which could sink was recovered. All ponderable material slides over the steep inclined plane into deep water, and in vain have

divers attempted to explore that treasury of the deep. The tide sweeps them off their feet, and all attempts thus far have been abandoned.

It is, however, a mistake to suppose that the Goodwin swallows up everything which is wrecked on the crown of the shoals. The iron wreck of the "Light of all nations" peers occasionally above the surface, as do the stumps of Bullock's safety beacon! Several feet in depth of the upper sand is quick and shifting in proportion to the violence of the wind and surge which agitate the surface. Ships or vessels subside and become sanded to their floor-heads generally; all their topsides or upper sections are scattered and drift away upon the tide. But this depth of shifting sand is sufficient to cover up ponderous metallic bodies, and the tide does not leave the shoal dry a sufficient time at low water to recover them.

There they rest!—Anchors, chains, guns, shot, with the iron knees, bolts, and fastenings, and no small quantity of railway iron, and other part cargoes of lost vessels, iron machinery, &c., belonging to the past and increasing with the future! Then there are the lost and massive experimental cylinders, imbedded in a vertical position, so favourable to polarisation: and the massive chains and sinkers, with their iron buoys! All this may not be sufficient to disturb the compasses of a ship.—But, forewarned forearmed! Take a recent case:—A valuable steam ship leaves a Dutch port; her course is direct. She has not to tack; the distance is comparatively nothing in fine weather to steer for a strait some six leagues in width; but it is hazy, and she goes head foremost on to the Goodwin Sands. Salvage services for getting her off are more than a thousand pounds, and the voyage as to profit is ruined. But what was the anxiety and consternation of the passengers! What the torturing suspense to the officers and crew till she was afloat again?

It is said, that these fine steam ships which touch in England and go on to the German ports, are so nicely adjusted as to time, that they cannot slack their speed to get an occasional cast of the deep sea lead. We hope and believe that this is not the truth; for by a judicious use of the lead, they might be kept in a deep water channel, and pass through the straits securely and safely. An occasional cast of the lead would also show them the rate and set of our fickle tides at the time. It is a check to compass, courses, and to distance run; and the only sure safeguard of life and property. Again we say,—Be guarded in this iron age against magnetic disturbance either within or without the ship! and *Do not neglect and despise the lead. Forewarned is forearmed!*

Yours, &c.,

K. B. MARTIN,

Harbour Master, Ramsgate.

To the Editor of the Nautical Magazine.

Clearing the Lunar Distance.

Scarborough, Jan. 2nd, 1858.

Sir,—The "Short Method for Clearing the Lunar Distance" given by Lieut. John Murray, R.N., in the *Nautical Magazine* for January, 1858, page 19, is not new. I had it a few years ago, although slightly different from it; the following rule is:—

1.—In two separate columns write the sine and tangent of the app. dist., the cosine and cotangent of the moon's app. alt., and the proportional log. of the moon's corr. of alt., and in the first column, the cosecant of the sun's (or a star's) app.-alt. The sums of these columns will be the prop. logs, of two arcs A and B.

2.—Again, in two other separate columns, immediately under the above, write the same as above only changing the app. alts., and corr. of alt. The sums will be the prop. log. of two arcs *a* and *b*.

3.—Subtract the arcs *a* and *b* respectively from the arcs A and B, that stand above them, and the remainders will be corr. I. and corr, II.

4.—To corr. I. always prefix the sign —; to corr. II., + when the app. distance is *less* than 90°; but when the app. dist. is *greater* than 90°, prefix the sign — to it; which will be easily remembered, if it be considered that its application by addition or subtraction is always such as to bring the distance towards 90°.

5.—To get the true distance a small correction will be necessary, and is thus ascertained:—Enter table 56 (Raper's; or Norie's 35) with the app. dist. corrected, and the moon's corr. of alt., and take out the seconds. Enter again with the amount of corr. I. and II., take out the corresponding seconds, and subtract them from those taken out before: the remainder is the 3rd corr. of distance, which must take the same sign as the corr. II., and you have the true distance.

Example.

The same as the first one given by Lieut. Murray.

Dist.....	55° 47′	sin. ..	9·9175	tan..	0·1675	
⊙ alt. ..	48 0	cosec..	1289			
☾ alt. ..	69 48	cosin..	9·5382	cot. .	9·5658	
☾ corr. of alt.	18′ 39″	P. log.	9846		9846	
Arc. A.....	48′ 32″	= P. log.	0·5692	P. log.	0·7179	= 34′ 28″ Arc B

Dist.		9·9175	(repeated)	0·1675	
☾ alt.	cosec.	·0275			
⊙ alt.	cosin.	9·8255	cot.	9·9544	
⊙ corr. of alt. ..	51″ P. log.	·5477		5477	
Arc. *a* 1′ 26″	= P. log.	0·3182	P. log.	0·6696	= 0′ 39″ Arc *b*

Corr. I.	— 47′ 6″	Corr. II.	+ 33′ 49″
Corr. II.	+ 33 49		
	— 13 17 Principal corr.	Dist.	(corr. of alt. 19′ = 2″
	55° 46 34 App. distance.	55°	(Prin. corr. 13′ = 1
	55 33 17 Corrected dist.		3rd corr. of dist. + 1″
	+ 1 3rd corr. of dist.		
	55° 33′ 18″ True distance.		

If you, Sir, would have the goodness to insert this in the next Magazine, I shall render a small service to seamen in general.

I am, &c.,

E. H. HEBDEN, Jun. of Scarborough.

To the Editor of the Nautical Magazine.

THE AMOOR.—*From the Moniteur de la Flotte.*

A maritime paper of Moscow, the *Moskoi Hornek*, publishes the following notices concerning steam navigation on the River Amoor.

The Amoor clears itself of ice at the station of Nicolacoskii on the 9th—21st May. It is worthy of remark that the clearance has taken place on this very day the three preceding years. The steamboat *Lena* was launched the 31st of May—12th of June,—and four days afterwards, having embarked the mail and some merchandise, proceeded for the station of Mareinskii.

On the 31st of May—12th of June—the *Lena* left this place and continued her course up the river with the mails, some merchandise, and forty soldiers, to West Strelotchnoi Karraoul, a little fortified place situated on the Upper Amoor at the confluence of the Chilka and the Argoun, the united waters of which form the Amoor. Up to the present time two ships only have proceeded up the Amoor when the river is full; these are the steamer *Argoun*, built on the River Chilka, and the steam sloop *Nadijda*, (Esperance,) which vessel, in 1855, was only able to get up the river as far as far as Honrinea, an affluent of the Amoor, not far from Albazine. The communication on the river is commonly carried on by means of track boats, rafts, and small vessels.

The *Lena* steamer is the first vessel which has successfully navigated the river from the station of Nicolacoskii as far as the Chilka, that is to say, where the river begins to take the name of Amoor. This vessel in her first voyage drew three feet and a half of water; she ran three thousand versts in thirty days. This is a tolerably long voyage, for supplies of wood could not be provided, and the vessel was often obliged to wait a whole day while the crew were cutting wood.

These supplies would last for about three days, and moreover the vessel then had but half of the necessary steam from the freshly cut wood being damp.

From that time the regular navigation has been established throughout the Amoor. In the course of last summer, communication was carried on by two Government steamers, the *Lena* and the *Amour*. Their number will be considerably increased on the opening of navigation next year, several steam-vessels having been ordered for it in America.

The establishment of regular steam navigation, which requires a more perfect knowledge of the river and its delta, which vessels coming from the Pacific Ocean and the Sea Okotsk have to navigate, has completely altered the character of the Russian functionaries inhabiting that distant country. In the mean time they obtain at moderate prices every necessary supply from Transbaikalie and America.

Siberia furnishes corn, tea, cattle, poultry, woollen cloths, officers' effects, &c. America sends cotton, wool, silk, clothing, hose, linen, articles of copper and iron, and household furniture, colonial articles, sugar, molasses, wines cigars, &c.; these last are sent in large quantities, and from this year the first exchange will commence between Russian and American merchandise. The salt pork of Transbuikalie has been exported by the Americans for sale in ports of the Pacific Ocean, and sugar and cigars of America are seen in the shops at Irkoutsk.

The Late Hydrographer to the Admiralty.

Sir,—In the *Daily News* of January 15th, I have seen a memoir of the late Sir Francis Beaufort, containing an extract from the Autobiography of Sir J. Barrow, which runs thus:—

"After the resignation of the Duke of Clarence as Lord High Admiral, Lord Melville again became First Lord, and one of his first objects was to fill the office of Hydrographer with the best man that could be found, who should hold it permanently.

"There were many applicants, but by 1829 two names only remained for a choice, and one of them at least was not an applicant,—Captains Beaufort and Peter Heywood."

As the widow of the late Capt. Peter Heywood, I am anxious that the *truth* should be known, and therefore request you to insert this letter in the *Nautical Magazine* in justice to the memory of my husband, who never was an applicant for the office of Hydrographer, or any other public employment on shore.

After the death of Captain Hurd, that office was offered to Captain Heywood, but he declined it for reasons then existing.

After Captain Parry had resigned, it was again offered to Captain Heywood by Lord Melville himself, who sent specially for him for that

purpose. But the same reasons existing, which Captain Heywood explained, he again declined the office, at the same time saying that Captain Beaufort was the fittest person to fill the vacant post.

I never saw the Autobiography of Sir John Barrow, and until I read the extract from it in the *Daily News*, was not aware of the paragraph in question, or the subject of it would not have remained so long without being rectified by

FRANCES HEYWOOD.

A sense of justice, a respect for the memory of an excellent officer, as well as a regard for the feelings of his esteemed and respected widow, secures the appearance of the foregoing letter in the pages of the *Nautical*. Most of us perhaps have seen the memoir to which she alludes, the production of some admiring friend of the late Hydrographer, and those who knew him can make allowance for the too evident partiality of its author. We had learned from another source, too late for our own brief notice of his services in the January number, the fact that when the office of Hydrographer was offered to Sir Francis Beaufort, it *was on the recommendation of Captain Peter Heywood*, as stated by that much esteemed lady his widow, and in justice also to the memory of Sir E. Parry, the immediate predecessor of Sir F. Beaufort, we should have said that, from our own knowledge, the surveys of our shores were *commenced* under *his* direction. We had no desire, however, much as we respect the memory of the late Hydrographer, to invest him with such attributes as to induce the belief that he was "a man without a fault," as stated in the memoir alluded to, for we knew too well that his own strong sense of right and wrong would spurn the fond desire of any one that he should ever be held up as a piece of *perfection*. But such is left to us as the *opinion* of the author of that memoir, who, in painting up the hero of the tale, would have done well to have remembered the motto, "*Audi alteram partem.*"

THE ENGLISH AND FRENCH NAVIES.

In reference to the remarks on the French Navy which have appeared in some recent numbers of the *Nautical*, we meet with the following under the name of *a curious offence* in the daily prints. "The Minister of Marine," says the *Phare de la Manche*, "having learned that some French fishermen continue to purchase their fish instead of fishing for it themselves,—especially on the English coast, has decided that men so offending shall be compelled to enter the service of the State for a given time, and shall besides pay the penalties to which they are liable under the decree of the 9th of January, 1852." The British naval service it is well known has long ceased to be compulsory, the exigencies of the State not requiring it; but it is

proposed in this number, with the view of encouraging the Government to assist towards the construction of an establishment for decayed Merchant Seamen, on a similar plan to that of Greenwich Hospital, for every merchant seaman to serve five years in the Navy in the course of his whole sea service as one of the conditions required to entitle him to the advantages of that establishment, which it is to be hoped will sooner or later be carried into execution. And without such assistance we much fear such an establishment will never see the light.

BATTLE OF KUDJWA.

Camp, Futtehpore, Nov. 6th 1857.

Sir,—I have the honour to lay before his Excellency the Commander-in-Chief the details of the battle of Kudjwa, with the circumstances that preceded it.

Detachments amounting to 700 men, under the command of Lieutenant-Colonel Powell, of H.M. 53rd Regiment, in charge of siege-train guns and a large convoy, were proceeding from Allahabad to Cawnpore, and had arrived on the 31st ult., after a march of twelve miles, at the camping ground of Thurrea. The same afternoon intelligence was received from Futtehpore that the Sepoy mutineers of the Dinapore regiments, with three guns, had passed the Jumna with the intention of either attacking Futtehpore or crossing over into Oude. The camp was immediately struck, and we arrived at the camping ground of Futtehpore at midnight.

Colonel Powell then made arrangements for marching at daylight upon the enemy, who were reported to be about twenty-four miles distant at Kudjwa, beyond the village of Binkee. The column of attack consisted of 162 men of H.M. 53rd Regiment, under Major Clark, 68 of Royal Engineers, under Captain Clarke, 70 of a Depot Detachment, under Lieutenant Fanning, of H.M. 64th Regiment, and 103 of the Naval Brigade under Captain Peel. It marched at daylight, and was joined from the garrison of Futtehpore by a company of 93rd Highlanders, 100 in number, under Captain Cornwall, and two 9-pounder guns, under Lieutenant Anderson, Bengal Artillery.

After marching for sixteen miles the column halted for refreshment, and then resumed the march at a rapid pace, passing through the village of Binkee at about 1.30 p.m., where the intelligence was confirmed that the enemy was at hand.

The troops pressed on without interruption; the Highlanders advancing in skirmishing order, supported by the Royal Engineers, and followed by the 53rd Regiment, in column, and then by the Naval Brigade; the Depot Detachment was with the baggage. We advanced along the road which led straight for the village of Kudjwa, and saw that the enemy's right occupied a long line of high embankment on

our left of the road, which embankment, screened by a grove, continued towards the village, and that their left was higher up on the other side, with their guns posted in the centre on the road, two of them in advance, and one on a bridge near the village.

A round shot, coming down the road, opened the battle at about 2.20 p.m., and the column was ordered to edge to the right, and advance on the guns through the corn-fields—the skirmishers of the 93rd and the Royal Engineers pushing up on both sides of the road. The enemy's artillery was well served, and did great execution, and the flank fire of musketry was very severe. The gallant Colonel Powell himself, on the left of the road, pressed on the attack, and had just secured two guns of the enemy when he fell dead with a bullet through his forehead.

In the meantime the Naval Brigade had advanced on the right of the 53rd, and carried the enemy's position in their front. It was then that the death of Colonel Powell was reported to me, and I was requested to assume the command. The great force of the enemy, the long line of their defences, and the exhaustion of both officers and men after such long marches, rendered our position truly critical. The front of the battle had become changed to the line of the road, and the enemy, with all their force behind their embankments, threatened to intercept our rear. I left Lieutenant Hay, R.N., supported by the two 9-pounder guns, to hold the position which his party had gallantly carried, and which secured our flank; and collecting as many fresh troops as were available, assisted principally by Lieutenant Lennox, R.E. (Captain Clarke being unfortunately severely wounded), and by Ensign Truell, of the 53rd, we rushed across the road, and passing round the upper end of the embankments, divided the enemy's force, and drove them successively from all their positions. The enemy then retired in confusion, leaving us masters of their camp, and with two of their guns and a tumbril in our possession.

The late hour of the evening (it was half-past four when the enemy fired their last shot), and the excessive fatigue of the troops, prevented any pursuit. We therefore spoiled their camp, and leaving it with cheers, formed on the road by the bridge near the village, and sent out parties to collect our dead and wounded.

With the body of the Colonel on the limber of the gun he had so gallantly captured, we then returned, and encamped near the village of Binkee.

Our loss in the action was very severe, amounting to 95 killed and wounded.

The behaviour of the troops and of the Naval Brigade was admirable, and all vied with each other and showed equal courage in the field. The marching of the 53rd and the accurate firing of the Highlanders deserved special recommendation.

I received the greatest assistance from Captain Cox, H.M. 75th Regiment, whom I would wish to bring to the favourable notice of his Excellency the Commander-in-Chief, and the arrangements of the field hospital under Dr. Grant, H.M. 53rd, and those of the quarter-

master's department, under Captain Marshall, were everything I could wish.

The total number of the enemy was reported to be about 4,000 men, 2,000 of whom were Sepoys, who fought in their uniform. Their loss was estimated at about 300 killed.

I have, &c.,

WILLIAM PEEL, *Captain R.N., Commanding.*

I have the pleasure to inform his Excellency that the remaining gun of the enemy, with three tumbrils, were brought in this evening by the police, having been abandoned by the rebels in their flight about eight miles beyond Kudjwa, and that the Sepoys have dispersed in all directions, pursued by the villagers.

REMARKABLE PHENOMENON NEAR THE AZORES.

The subjoined deposition and letter, having reference to a presumed submarine convulsion observed near the Azores in November last, have been received at the Admiralty:—

British Vice-Consulate, Terceira, December 21st, 1857.

Sir,—I have the honour to enclose copy of a document obtained at my request from Mr. William Cook, Master of the British schooner *Estremadura*, of Glasgow. It appears that he did not think of trying the temperature of the water, which is to be regretted, as it might have tended to prove that the effects observed were those of submarine action. No shock of earthquake was felt at this island at the time. It serves, however, to show that mariners never can be too cautious when approaching these islands, as from one day to another there is no knowing what formation may take place either above water or awash; for instance, the island Sabrina, in 1811, and the danger seen by three vessels proceeding to St. Michael's, in 1849, about forty miles to the W.N.W. of that island, which gave rise to Mr. Consul Hunt inducing the Masters of the vessels *Æolus* and *Prospero* to go in search of it, but without success.

I have, &c.,

JOHN READ, *H.B.M. Consul.*

To the Secretary of the Admiralty.

Deposition.

I, the undersigned, Master of the British schooner *Estremadura*, of Glasgow, whilst on a passage from Troen to the Island of Fayal, with a cargo of coals, do hereby declare that in lat. 39° 57′ N., long. 25° 50′ W., at seven p.m. of the 25th of November last, I observed abaft the beam what I considered to be a squall, but which eventually turned out to be a kind of mist or warm steam. It being my watch

on deck, I asked the helmsman if he found any difference in the air; to which he replied, it was quite warm. I called the mate up, and he as well as those on deck felt the same. This lasted for half an hour; there had been no fog or mist before. The wind at the time was N.E. by compass, and continued so throughout without any alteration in force. We had a following sea previous to falling in with this mist, but the sea then changed to a kind of boil or topping sea, as if surged up from beneath, but afterwards returned to the former state when we were clear of the mist. When this phenomenon occurred the Amplimont Rock, as laid down in the chart, would bear N.b.E. by compass, distant 140 miles. I calculate the vessel to have been going at the time from 7 to 7½ knots, with a following sea. Sighted Terceira on the 26th, and anchored in Fayal Roads on the 27th November.

WILLIAM COOK.
JOHN READ, *Consul.*

Those who know something of our pages will remember our account in 1841 of the different earthquakes and convulsions of nature which have taken place at and in the neighbourhood of the volcanic region of the Azores and they will not marvel at the foregoing account, which has recently appeared in the daily papers; but we preserve it as an addition to the history of that unquiet region. At the same time, as such phenomena may be always anticipated in that neighbourhood, we caution seamen to be on the look-out, especially when East of Terceira, or between it and St. Michael.

BURNING OF THE "SARAH SANDS," SCREW TRANSPORT STEAMER.

A fearful catastrophe by fire has happened to the *Sarah Sands*, transport steamer, on her passage to India from Portsmouth, with the head-quarters and a large portion of the men of the 54th Regiment on board, whose preservation and that of the crew may be fairly considered one of the most marvellous on record, as may be inferred from the fact that the ship was burning furiously in a heavy gale of wind 16 hours, the whole of her after part being burnt out to a shell.

The *Sarah Sands* was an iron ship, upwards of 2,000 tons burden, and was formerly employed in running from Liverpool to America. She was chartered by the East India Company for the conveyance of troops to India, and on the 16th of last August she left Portsmouth for Calcutta, under the command of Captain J. S. Castle, with a portion of the 54th Regiment on board, comprising Lieutenant-Colonel Moffatt; Captains Brett, Thomson, and Gillum; Lieutenants Galbraith, Hughes, and Crowpe; Ensign Wood; Lieutenant and Adjutant Houston; Surgeon Grant; Assistant-Surgeon Donovan; Quartermaster Hipkin; Paymaster Daniel; 21 serjeants, 15 corporals, 11

drummers, 306 rank and file, 8 women, 7 children, and a number of ladies, relatives of the officers.

The voyage appears to have been favourable until the 11th of November, when the ship had reached lat. 14° S., long 56° E. (upwards of 400 miles from the Mauritius). About three o'clock in the afternoon of that day the troops berthed on the after orlop deck noticed a smell of burning, which apparently proceeded from beneath them in the hold. It rapidly increasing, the alarm was given to Captain Castle, who at once ordered the after-hold to be examined; and, to the astonishment and horror of all, the cargo stowed there proved to be on fire.

It is stated that the bulk of the cargo there consisted of Government stores. Bale after bale was hauled up in the hope of getting at the seat of the fire; but in a short time the smoke became so dense as to defy any of the crew getting further into the hold. There was no confusion, however: every order was obeyed by the men with coolness and courage. The course of the ship was stopped. Col. Moffatt was seen in earnest consultation with Capt. Castle deciding upon measures for suppressing the flames, while the crew were actively employed in taking all sail in, and bringing the ship before the wind. Others ran out lengths of hose from the fire-engines, which were passed down to hands below, while hose was also put on to the donkey-engine. It soon became apparent that all these exertions failed in checking the progress of the fire.

Col. Moffatt, at the suggestion of the commander, directed his men to at once cast overboard all their ammunition, and in a short time they succeeded in clearing out the starboard magazine. The remainder of the powder in the port magazine, however, excited great apprehensions. Already had the after part of the ship become almost unapproachable from the dense smoke and heat which filled every portion of it. The colonel appealed to his men for volunteers to attempt to rescue the contents of the magazine now so threatened. Several brave fellows instantly came forward, and heroically succeeded it reaching the magazine and clearing it, with the exception, it is supposed, of one or two barrels. It was a truly hazardous work, several nearly lost their lives, they became overpowered with the smoke and heat and fell, and when hauled up by ropes to the deck they were senseless. The flames soon afterwards burnt up through the deck, and running along the various cabins speedily set the whole on fire.

There was a heavy gale blowing at the time, and Capt. Castle, perceiving the critical position of the ship, at once took measures for the safe lowering of the boats. They were launched without the least accident, the troops were mustered on deck, there was no rush to the boats, and the men obeyed the word of command with as much order as on parade. Col. Moffatt informed them that Capt. Castle did not despair of saving the ship, but for their own preservation it had been deemed advisable to keep the boats off so as to act in case of emergency. The ladies, women, and children were lowered into the lifeboat, and she was directed to stand off until further orders. All hands

then turned to constructing rafts of spare spars. In a short time three were put together, which would have been capable of saving a large portion of those on board. Capt. Castle succeeded in launching two overboard, and the third was left across the deck, to be lowered at a moment's notice.

In the meanwhile the flames had made terrible progress; the whole of the cabins, saloons, &c., were one body of fire, and about nine o'clock the flames burst through the upper deck and ignited the mizen rigging. Through the forethought of Capt. Castle in bringing the ship to the wind the fire and smoke were swept sternways, but serious anxiety was felt lest the ship should pay off, and so render her destruction inevitable. During this fearful suspense a dreadful explosion took place, no doubt arising from the one or two barrels left in the port magazine, which blew out the port-quarter. The ship from the main rigging to her stern was in one general body of fire. Captain Castle still had hope, although he expressed his fears to the commanding officer of the troops that the ship would be lost. Providentially the bulkhead of the after part of the ship withstood the action of the flames. Here all efforts were concentrated to keep it cool. Party after party of the troops volunteered for the work, and so endeavoured to prevent the fire making its way forward. For hours did this state of affairs continue.

Although the men kept the fire at bay below it gained the main rigging. Mr. Welch, the Chief Officer, with several of the soldiers, at once went aloft with wet blankets, and after considerable peril and risk succeeded in extinguishing the flames. As it was, however, some of the yards were destroyed. Towards two o'clock the following morning the men had the satisfaction of seeing the fire diminishing. The flames were gradually beaten back, and by daylight were entirely extinguished. It was not till then that the fearful havoc made by the fire was clearly ascertained. The after part of the ship was burnt out—merely its shell remaining; and now another fate threatened her. The gale still prevailed, and the ship was rolling and pitching in a heavy sea, constantly shipping water at the port quarter, which had been blown out by the explosion. She had fifteen feet of water in her hold, and active steps were necessary to prevent her foundering. All the men were set to the pumps and baling water out of the hold. Capt. Castle fearing the stern would fall out, got two hawsers under the bottom and made them taut.

The next difficulty was to stop the water which was pouring in through the quarter. Spare sails and blankets were placed over the opening and the leak was partially stopped. There was no abatement of the gale during the morning, and in every heave of the ship the water tanks in the hold which had got loose were dashed from one side to the other. The state of the ship and the continued severity of the weather rendered the constant working of the pumps and the baling imperative. It was not till two o'clock in the afternoon that the boats containing the women and children could be got alongside. They were got on board, and the other boats, which had been ordered off during

the raging of the fire, returned, with the exception of the gig, which had been swamped during the night; the officer in charge of her, however, Mr. Wood, and the hands were picked up by another boat. During the remainder of the day, the following night, and succeeding day, the whole of the hands and troops were engaged working the pumps and clearing the ship of the water. By the evening of the 13th the crew succeeded in securing the stern and getting steerage way on the ship. She had then drifted as far as lat. 13° 12′ S. Capt. Castle then set all sail and bore up in the hope of making Mauritius, and to the joy of all on board made that port in eight days, where her arrival and marvellous escape excited considerable sensation. The officers in command of the troops speak in the highest terms of the conduct of Capt. Castle during the trying occasion.

By the latest arrivals the head quarters and men of the 54th Regiment continued at the Mauritius, awaiting the arrival of a ship to take them on to their destination.

The *Sarah Sands* was heavily insured at Lloyd's.

We find the following further remarks on this ship in a Portsmouth paper. We know from certain authority that she was designed and built about twelve years since by Mr. J. Grantham,* of Liverpool, and was about the first ocean iron steamer built. The bulkheads were the special care of her builder, and happily were the means, with her iron shell, of saving the ship and all on board. The Portsmouth paper says,—

The loss of this steam-ship while on her way to India with troops is another apt illustration in favour of the efficacy of iron over wood for ship-building purposes, troop-ship-building especially. Had that ship been built of wood, she would inevitably have burnt her stern out, and then sunk with every soul on board in all human probability; whereas, the salvation of the troops and crew is reserved to prove that to the iron hull which enshrouded them are they indebted for the preservation of their lives. The gallant seamanship of her captain was the cause of the iron hull being saved: but for his cool and matured judgment and action, backed by the preservation of discipline and order among the troops by their commanding-officer, the ship would have been lost at sea.

But the *Sarah Sands* was a ship which never ought to have been taken up by the East India Company for the conveyance of troops at all. As regards fitness for the carriage of troops satisfactorily and the stowage of their baggage safely, it was astonishing to those at this port in authority who knew anything of those matters that she was allowed to leave it for her destination. Thrice did Major-General Sir James Yorke Scarlett, the Commander-in-Chief in this district, and his officers inspect the *Sarah Sands* before she was allowed to

* Who has just completed a most useful work on iron ship-building, accompanied by plates; which however we have not seen.—Ed.

leave; nor did she leave until after the strongest expressions of dissatisfaction had been expressed by Sir James in his official reports to his Royal Highness the General Commanding-in-Chief, denouncing her unfitness for the service for which she had been hired. This is well known, and the letters of Sir James Scarlett stand on record to prove that distinguished officer's vigilance and perspicuity in making his official inspection. The ship was in a filthy state on her arrival here from Liverpool, and a detention took place to get her clean before her cargo was allowed on board; another detention took place owing to the official reports made expressive of opinions of her bad capacity for stowage and berthing the troops; and when at last she did go she left under most unfavourable auguries relative to her safe arrival at her destination, which have been too surely fulfilled by spontaneous combustion,—for that, doubtless, will be found to be the origin of her loss.

The officers of the 54th had £5,000 worth of plate in her, and a couple of thousand pounds' worth of wine (!), as a rule obtains in the mess that an officer on joining shall contribute certain articles of plate and leave them behind when he removes; and the 54th is thus, we are informed, the richest mess in the army as regards their table equipment. The plate and wine, however, we think very likely are consolidated by the fire. Be this as it may, we hope the captain of the *Sarah Sands* will have a piece of plate presented to him, commemorative of his brave conduct whereby the hull of his ship and the lives of his gallant freight have, under the all-supreme guidance of a watchful Providence, been saved to his owners and to the nation.

Nautical Notices.

The Nile Rock.—*Coast of Grenada, Mediterranean.*

We find the following in a recent number of the *Moniteur de la Flotte*:—

"The result of a recent exploration made by order of his Excellency the Minister of Marine, shows that the *Nile Bank* was wrongly placed by that vessel in 1852, at three miles S.E. (by compass) of Estepona. On sounding at three miles S.E. of this town, when the tower of Marmoles was N.N.W. one and a half miles, the lead gave 14 fathoms, and in sounding towards the town, the depth decreased regularly as far as one mile from it to 6 fathoms. From the place where the bank is reputed to exist and going W.S.W. or towards the old tower of Sala, the depth also decreased regularly, and varied from 16 to 19 fathoms, and at half a mile E.S.E. of the tower of Sal Viejo the depth was 11 fathoms: the nature of the bottom was everywhere sand; an there is a little coral off Point Marmoles.

"This point, which forms the Eastern point of the bay of Estepona,

is terminated by a sand bank at a cable's length to the Southward, on the end of which there are 2 to 2½ fathoms water. According to the Captain of the Port of Estepona, this is the bank on which the *Nile* was lost in 1852, by standing along the coast too near; for at a cable and a half from it there are 3½ and 4 fathoms water. At six miles East of Estepona, and three miles South of the tower of Banos, there is a little bank of sand and rock on which the least water is 11½ fathoms; and between the tower and the bank there are 16, 17, and 22 fathoms water; but there is also a little pointed rock, with 8½ fathoms over it, exceedingly difficult to find from being so sharp."

Particulars of Lights Recently Established.

(Continued from p. 52.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
1. Cay Piedras	23° 14·5′ N., 81° 9′ W.	Cuba	Ff.	68	15	Est. 1st Sept., '57. Red flash every half minute.
2. C. Blanco	38° 59·8′ N., 1° 6·5′ E.	Iviza Island Balearic	R.	292	20	Est. 10th Nov., '57. Once a minute. Within three or four miles distance eclipse not total. Visible bearing from N.N.E.¾E. to S.W.b.W.¾W.
3. Bishop Rock	49° 52·5′ N., 6° 26·3′ W.	Scilly Isles	F.	110	14	Est. 1st Sept., '58.
4. Valparaiso	33° 1·2′ S., 71°41·5′W.	Chili		197	20	Est. recently on Point Angeles. A strong glare once a minute.
5. Umqua River	43° 40·3′ N., 124° 11·1′ W.	Oregon	F.	100	15	Est. 10th Oct., '57. On South Sands.
6. Lloyd Harb.	46° 54·8′ N., 73°25·8′W.	United States		40		Est. 10th Nov., '57. On S.E. point of Lloyd Neck, on North side of harbour.
7. Sapelo Island	South extreme	Ditto		50		Est. 1st Jan., '58. Leading light. In line with principal light. When beacon on Wolf Island bears S.W.b.W.½W. steer N.W.b.W.½W.
8. Sylt Island	North extreme	Denmark		O.63 I. 72	10 13	Est. 1st Jan., '58. Two lights—outer one a red hue—2,910 yards apart, E.S.E.¼S., W.N.W.¼N. In line lead over bar 16 feet. Temporary lights discontinued.
9. Seraglio Pt.	Constantinople	Turkey	Ff.	147	15	Est. 25th Dec., '57. A green flash once a minute, preceded and followed by a short eclipse. Visible bearing S.¾W. round West to E.N.E. In lieu of former.
Leander Twr	Bosphorus	Ditto	F.	36	4	Est. 25th Dec., '57. Red: one above the other.

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

Torres Strait.—The passage through Torres Strait is growing up very fast with coral islands and reefs, which make it very dangerous, and few ships attempt it now.

The foregoing appears in the papers of the day without further particulars. We all know that coral will grow, and that the dangers of that strait should increase year by year is to be expected.

LONDON SHOALS: *China Sea.*—The following important information appears in a recent number of the *Shipping and Mercantile Gazette.* Report of the barque *Dayspring*, Knowles, sailed from Hong Kong, August 29th:—At five p.m. on Sept. 11th, passed the West London Shoals in the China Seas at the distance of a mile; from the mast-head it appeared of an oval form, or an oblong circle, the sea breaking all round the edges, and in the centre the water as smooth as a pond, several rocks some eight or ten feet high appearing above water on the eastern side: it is laid down on the charts as having several feet of water on its shoalest part.

CORAL BANK—*off Akyab Harbour.*—Least water 5¼ fathoms at low water spring tides, three and a half miles in extent, running N.W. and S.E. The following are the bearings taken from the reef on the shallowest part and about its centre:—Savage Lighthouse N. 46° E.; Table Land 65°; North Hummock 50°; South end Birongo Island S. 74°.—J. W. Porter, Assistant Marine Surveyor.

[We take that as we find it in the *Shipping Gazette*, but can make nothing of it,—and request Mr. Porter or any of our readers to rectify it for us.—ED.]

FIXED LIGHT—*off the English Bank: River Plata.*—The following appears in the *Daily News* of the 20th of January, and is the first account that we have seen of this important light.

We are enabled by the kindness of Capt. Curlewis of the *Camilla* to give the following notice of a light-vessel in the River Plate, placed there lately:—A light-ship, moored off the N.E. end of the English Bank, showing a fixed bright light, distant about eleven miles from the Island Flores. Cross bearings—Flores N.b.W. ¾ W.; the Mount N.W.b.W. ½ W.; Pan de Azucar N.E. ¾ E. [These are compass bearings and with the exception of the last agree very well: sufficiently so to place it "off the N.E. end" of the bank.—ED.]

CRONSTADT,—*Leading Lights.*

The Hydrographic Department at St. Petersburgh informs navigators that to facilitate the entrance of the road of Cronstadt, two leading lights are placed in the battery of St. Nicholas (Cronslott). These two lights, on wooden structures, were lighted on the 22nd of October, 1857. The highest and easternmost, which is white, is visible at five miles distance between N. 61° W. and N. 71° W. [bearing from S. 61° E. to S. 71° E. from the ship, ED.], and to the East it shows a clear light from North to South (180°).

The lower light is red, in an Argand lamp, and visible at the distance of three miles Westward from it. It is intended only as a leading light, and bringing the two lights in line, bearing S. 66° E., and keeping them so, leads through the middle of the channel.

Ships which navigate the road West of Cronstadt at night, may follow the line of these lights without danger, but they should always keep within the limits of the bright light. The red light, which serves only as a directing light, is visible from the shoal water on each side of the channel. And in order that this channel may be always open, it is required that ships do not anchor on the above bearing of the lights.—*Moniteur de la Flotte.*

Rear-Admiral Milne.

Although we transgress the bounds of etiquette, we cannot deny ourselves the pleasure of preserving the following from the columns of the *Portsmouth Herald*, and adding to it our own testimony in confirmation of much that is said therein from personal knowledge. Very many of the great improvements which have taken place in the Royal Navy since Captain Milne took his seat at the Board of Admiralty, have been the work of his own hands, and very much we know they are appreciated in the service.

"Captain Alexander Milne (1839), who becomes Rear-Admiral of the Blue by the death of Vice-Admiral Coode, is the youngest son of one of the most distinguished heroes of the old war, Admiral Sir David Milne, G.C.B., the second in command to the gallant Exmouth at Algiers. Captain Milne entered the Royal Naval College, February, 1817, in the eleventh year of his age, and went to sea in 1819. He was made a Lieutenant in 1827, having served in various ships in North America, South America, West India, and Brazils. He was made a Commander in 1830, after three years' service at Brazil, but did not get an appointment until 1836, when he commanded the *Snake*, 16. In this vessel he served in the West Indies, and captured several slavers, and after obtaining the rank of Captain in 1839, in command of the *Crocodile*, in the West Indies, he was in charge of the Newfoundland and Labrador fisheries, and subsequently made other captures of slave vessels by his active cruising. He paid off the *Crocodile* in 1842, and was Flag-Captain to his father at Devonport, from 1842 to 1845, during which time he most ably commanded the old *Caledonia*, 120, in the experimental trial sailings. In 1846 the present Admiral of the Fleet, Sir Charles Ogle, selected this excellent officer as Flag-Captain at Portsmouth, when, in the subsequent trial sailings, he commanded the flag-ship *St. Vincent*, 120, and afterwards, as Flag-Captain to Sir Charles Napier, commanded the *St. Vincent* in the experimental fleet until he was called to Whitehall by his appointment as a member of the Board of Admiralty in December, 1847. For more than ten years Admiral Milne has been a member of successive Boards—one of the working bees of the hive; he has had various departments under his superintendence, and the improvement and progress that have been made in each and all mark the value of his services to the Navy and to the Government. It will not be forgotten that he was the superintendent lord of the transport and victualling department of the Navy during the late war with Russia, when it may be fairly said the admirable arrangements of the navy saved the army from starving. He has ever been a most valuable authority on all matters of business, and is generally regarded as one of the most hard-working public servants."

Sayings and Doings.

AMERICAN STEAM-SHIPS.—The Ottoman Porte has ordered a screw ship of the line to be constructed in the United States, and has charged Rear-Admiral Mehemmed Pacha and Hussien Bey, sub-surveyor of the dockyards, to go to America, to superintend the construction of the vessel and to study the American system of ship-building.

A steam yacht has just been completed at Boston for the Viceroy of Egypt, which is considered a model of beauty in form and workmanship. Composition metal is used instead of iron for her fittings; the cabins are finished in a tasteful and elaborate style, and her speed is expected to compare favourably with anything afloat.

SAVING THE COLOURS.—When the *Sarah Sands* was almost enveloped in a blaze of fire at sea on the 19th November, it was suddenly recollected that the colours of the 54th were in the aft part of the saloon, which had been quite forgotten in the anxiety to get out the powder. It was then that one of the quartermasters of the ship (Richmond), in the most gallant manner, volunteered to try and save the colours. He went down, and succeeded in bringing up the Queen's and, after giving it up, fell down fainting. As soon as he recovered he again insisted, with one of the privates (Wills), in trying to get the regimental colours; again he succeeded, and again fainted. The doctor was afraid for some time he would not recover, but we are glad to say he is now all right again.

THE NAVAL BRIGADE IN INDIA.—A letter from Cawnpore says Captain Peel's Jacks are roaming about camp in a remarkably free and easy manner. Queer fish these amphibious gentlemen are. One, Crusoe-like, has quite a menagerie in his "cabin," as he calls his pall. Rough and ready rollicking boys they are, and present a striking contrast to the prim dragoons you now and then meet striding majestically along. I hear that the "nagurs" have a horrible dread of them, having been told by some inventive individual that they were cannibals, and it was their habit to eat their fill of the slain, and salt the remainder down for future use! and that accounted for each man carrying a clasp knife by his side. Next to the Jacks, such of the Highlanders as wear kilts seem to stand highest in the fear and reverence of the natives.

REEFING COURSES AND TOPSAILS.—An Admiralty Circular dated the 30th ult., directs that the topsails and courses of H.M. ships are in future to be fitted with reef beckets instead of points; and toggles are to be securely fitted round the yards (as pointed out by models sent to the respective dockyards), and the reefs are to be secured to these toggles, and *not* to the jackstay.

THE ATLANTIC CABLE.—President Buchanan and the Secretary of the Navy warmly approve and have acceded to the application of the Atlantic Telegraph Company for the steam-frigate *Niagara* to assist in laying the submarine cable between Ireland and Newfoundland in June next.

COMMISSIONS OF NAVAL OFFICERS.—The commissions of officers of the Royal Navy will in future be forwarded to the ships to which they are appointed, instead of the Admiral Superintendent's office as hitherto, and the stamp is to be deducted from each officer's pay.

ROYAL NAVY.—The official *Navy List*, just published, shows the following to be the force of the ships in commission on the date of publication:—

Where Employed.	*Ships.*	*Guns.*	*H.P.*
Home station	71	2,148	10,340
East Indies and China	65	845	18,841
Mediterranean	23	585	5,758
Coast of Africa	22	129	3,934
North America and West Indies	16	350	2,830
Pacific	12	346	1,540
Particular service	12	50	2,300
Brazils	7	125	500
Cape of Good Hope	5	137	930
Australia	3	49	—

The number of officers, employed and unemployed, standing on the *Navy List* is given as follows:—

Flag Officers	297	Chaplains	150
Captains	666	Naval Instructors	88
Commanders	1030	Surgeons	348
Lieutenants	1715	Assistant-Surgeons	255
Masters	475	Paymasters	511
Engineers	127	Assistant-Paymasters	134
Mates	165		
Second Masters	105	Total	6066

Wire rigging is to be generally brought into use for all H.M. ships, to be ued for lower rigging, bobstays, and bowsprit shrouds for all ships.

VOYAGE OF THE "NOVARA."—The Austrian frigate *Novara*, which is performing a voyage round the world, left Table Bay on the 18th November for Singapore. During the stay of the *Novara* at the Cape, the members of the scientific mission on board made several excursions in the neighbourhood, and collected a number of important specimens connected with the natural, mineralogical, and botanical history of the country.

The President of the United States has presented a silver trumpet, with a complimentary letter, to Captain Wallace Mac Lennon, of the British ship *Star*, in acknowledgment of services rendered by him to the shipwrecked crew of the American schooner *Northern Light*.

The ship *Sir Charles Napier*, lost on the Kish Bank in Dublin Bay on the 19th of December last, has been proved at the inquiry held by order of the Board of Trade to have had "a cargo principally of iron: 6,000 iron pots—equal to ten tons in weight—and a large quantity of hoop iron in faggots were stowed between decks in close contiguity to the binnacle compass,"—facts sufficient of themselves to vitiate insurance. The underwriters should look to it. How could the compass be expected to remain efficient under such circumstances? It is said that she had a cheap captain, one of those who trouble not their heads about such matters, and this is how *some* British ships are sailed in the middle of the nineteenth century!

TO CORRESPONDENTS.

We refer "J. A." to that excellent weekly paper *Mitchell's Maritime Register* for all such information as he requires—in which a ship may be traced from the time of her leaving the dock at home to her return to it—by referring to the columns of Homeward bound—Spoken—Arrived Home, &c., giving him all he can desire.

WIND GUAGE

BY

SIR WILLIAM HARRIS F.R.S.

Scale, ½ natural size.

REFERENCE TO COLUMNS.

1. Height of Column.
2. Pressure in lbs. on a foot square
3. Feet per Second.
4. Miles per Hour.

FIG.1.

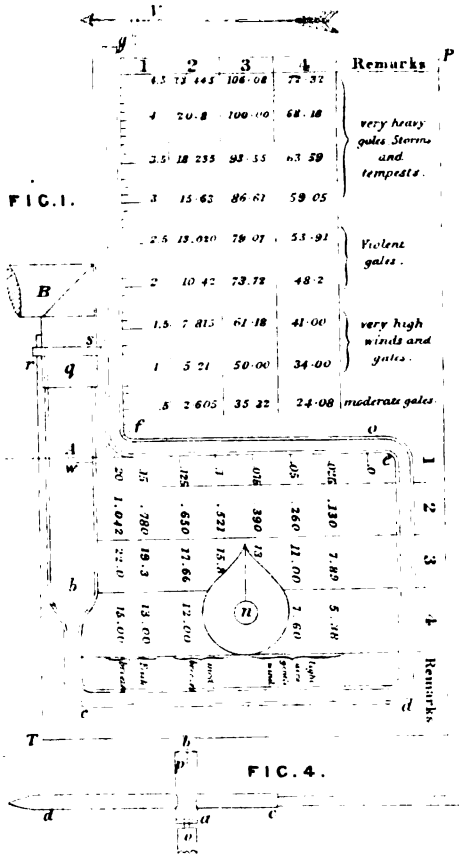


FIG.2.

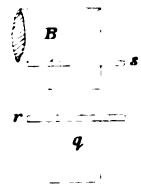


FIG.3.

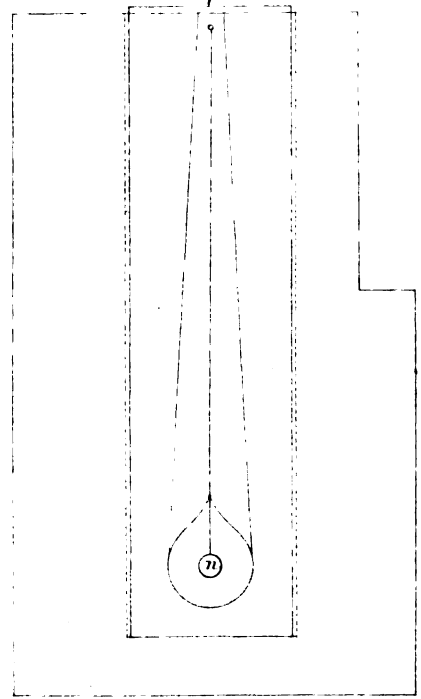


FIG.5.

Melby & Sons

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

MARCH, 1858.

On a New Form of Lind's Anemometer,—*By Sir W. Snow Harris, F.R.S.*

1. A convenient instrument of a simple and portable kind for observing at any instant the force and velocity of the wind would be of great practical value, not only to science generally but to those whose professional occupations involve questions of atmospheric force in particular. To the naval and civil architect, the civil engineer, and the mariner such an instrument would be especially useful, as enabling them to estimate the amount of force with which they have to contend in strong and heavy gales of wind, and the precautions requisite for providing against it. Where stationary or permanent observatories admit of being erected, very perfect apparatus has been contrived for this purpose as in the beautiful and invaluable anemometer of Osler—to be seen in operation at the Royal Exchange in London,—or in the revolving apparatus of Dr. Robinson. The mariner, however, and the general scientific traveller or voyager will require to determine the force and velocity of the wind at places and at particular moments when the aid of such refined measures is impossible.

2. The portable anemometers hitherto invented do not appear to have fulfilled practically all the required conditions of anemometrical observation, at least few if any of them have been generally employed. In the royal navy the force of the wind is usually set down in somewhat arbitrary numbers, depending on the chance judgment of the various observers. Thus we find entered in the logs of H.M. ships 1, 2, 3, &c., for representing the force of the wind, numbers which in different logs may signify very different forces, that is if the

different observers have not been individually trained together, and have not come to a complete understanding upon the question one with the other, and even then the observations would be too loose and indefinite for any good scientific purpose.

3. The anemometer invented by Dr. Lind so long since as the year 1775, and which measures the pressure of the wind in terms of the altitude of a column of water which the wind can sustain at a given instant, appears in principle to be the most available and accurate means of estimating the force of the wind; which can be employed in the construction of a portable anemometer, more especially for sea-going purposes. Nevertheless, the instrument as originally constructed has been found not altogether free from objection, especially when applied to estimate very small forces, which it is next to impossible to observe through the medium of the small column of fluid sustained; and, although recommended to be used in the royal navy by the distinguished editor of the Admiralty *Scientific Manual* (sec. ix.), has given way to the method of registering the winds by arbitrary numbers as just alluded to: so that we have really no scientific instrument in use in H.M. ships by which the force of atmospheric currents, and upon which the mariner is so dependant, can be at all estimated.

4. The great efforts lately made in America to obtain scientific meteorological observations on various parts of the ocean, and the countenance given to this important question by the British Government under a Meteorological Department of the Board of Trade,* has encouraged me to attempt a new form of wind gage on the principle of Dr. Lind's instrument; by the use of which a fair approximation to the pressure and velocity of the wind may be obtained at all times, taken between the limits of very light airs and tempests.

5. The elementary physical principles on which this instrument is based are few, plain, and intelligible. Taking a mean atmospheric pressure such as we find around us and at the level of the sea, we

* The superintendence and charge of this new office, established in 1855, is at present entrusted to Rear-Admiral Fitzroy, whose life and private fortune has been largely devoted to the advancement of practical naval science and the progress of natural knowledge generally. His truly valuable and comprehensive work, entitled *Narrative of the Surveying Voyages of H.M.S. Adventure and Beagle*, and the *Beagle's* circumnavigation of the globe under his immediate command, display fully the zeal, enterprise, and ability of this distinguished officer and his especial fitness for the care of such an office. In undertaking and carrying out, between the years 1831 and 1836, his surveying voyage in the *Beagle* and the circumnavigation of the globe, no expense, supplied from his private means, was spared; regardless of cost, every instrument and possible thing likely to advance the national interest or the progress of science was provided. Any one who peruses with attention Admiral Fitzroy's highly instructive and valuable narrative, will not fail to admit, that science generally, and the country especially, owes him a debt of gratitude which it can never adequately repay. Those who desire full and accurate information relative to this new office will be amply recompensed by a perusal of Admiral Fitzroy's capital Report of the Meteorological Department of the Board of Trade, presented to both Houses of Parliament (1857).

know by the ordinary barometer that it can support a column of mercury about 30 inches high,—that is to say, a column of air reaching from the surface of the sea to the altitude of the atmosphere is equal to the weight of a column of quicksilver of the same area of transverse section 30 inches high. If we take an area of one square inch the absolute weight of such a column would be about 14·75lbs. avoirdupois. But we may balance a column of any other fluid in this way with the pressure of the atmosphere;—for example, water. In this case the column would be as much higher as water is lighter than mercury: according to their relative specific gravities mercury is about 13·6 times the weight of water; hence the column of water would be $30 \times 13{\cdot}6 = 408$ inches or about 34 feet high, supposing no disturbing force to interfere; this column, therefore, would also weigh 14·75lbs.: the pressure of the air in mass, therefore, may be taken at 14·75lbs. on the square inch, that is 2124lbs. on the square foot.

6. Suppose now a column of air when in motion horizontally can by its resulting pressure sustain a column of water of an inch in height above the pressure of still air, that pressure would be the 408th part of 2124lbs., or about 5·2lbs. on the square foot nearly, supposing it to press on an area equal to the sectional area of the moving column. If the pressure were more or less, as measured by the vertical column of water it could sustain, then the force would be so much greater or less than 5·2lbs. on the square foot. If the column, for example, were only $\frac{1}{10}$ of an inch high, the pressure of the wind on a foot square would be represented by 0·52. If it were twice as high, or 2 inches, then the force would be 10·4lbs. on the square foot and so on. If the height of the column were from 10 to 12 inches high the force would be from 50 to above 60lbs. on the square foot, and would indicate such a hurricane as could root up trees and blow down buildings. The physical basis, therefore, on which an instrument of this description would rest is perfectly sound and satisfactory.

7. Moreover, it is not only the force but the velocity of the wind which may be estimated by such an instrument. A very complete and careful series of experiments carried out by the celebrated Dr. Hutton of Woolwich with Ellicot's whirling machine, and previously by Mr. Rouse, an ingenious gentleman of Harborough, in Leicestershire, with a similar apparatus, showed that a wind moving at the rate of 20 feet per second pressed on a square foot of surface with a force of from 12 to 13ozs., and that the pressure force varied with the square of the velocity or very nearly. Taking then 5·2lbs. pressure on the square foot, due to a column of fluid an inch high as just found, we arrive at the corresponding velocity by the following proportion:—Taking the square roots of the forces, we have $\sqrt{12{\cdot}5} : \sqrt{83{\cdot}2} :: 20 : 50$, nearly. So that if the force of the wind sustains a column of water an inch high, its velocity is at the rate of 50 feet in a second, or about 34 miles per hour. From these data we may

easily calculate a table of forces and velocities corresponding to the respective columns of fluid in the gage.

8. The unit of pressure on a square foot may be also arrived at by other very elementary and simple considerations. If we take a cube of water 12 inches cube at 60° of Fahrenheit's thermometer it will be found to weigh 1,000 ozs., or about 62·5lbs. Imagine such a cube to rest on a horizontal plane,—its pressure would be represented by 62·5lbs.; suppose the cube to be now divided into 12 equal horizontal slices,—each slice would be an inch high and would weigh the $\frac{1}{12}$ part of 62·5lbs., that is 5·2lbs. nearly; so that the pressure of a square column of water a foot square and one inch high would be represented by 5·2lbs. avoirdupois.

If we suppose a cylinder of water of any diameter cut out of this horizontal section of the cube of one foot cube, that cylinder would be an inch high and might be taken to represent a pressure of 5·2lbs. on the square foot. If the cube be divided horizontally in two equal parts and the same process repeated, the cylinder of water would be 6 inches high, and would represent a pressure of 6 times 5·2lbs. to the square foot—that is 31·2lbs. If on the other hand we subdivide the section of an inch high into thinner slices, the cylinder cut out of each would correspond in altitude with these subdivisions, and might be taken to represent the pressure of each of these subdivisions on a foot square. Now the pressure gage indicating the force of the wind in terms of the altitude of the column of water it can support is reducible to this. So that if the wind sustains a column of fluid one inch high the pressure on the square foot is 5·2lbs., no matter for the diameter of the column. If it sustain a column of greater or less altitude than this the force on a foot square will be so much greater or less than 5·2lbs.: suppose the altitude of the column sustained was $\frac{1}{10}$ of an inch high only, then the pressure on the square foot would be the $\frac{1}{10}$ of 5·2lbs. and would be represented by 0·52, and so on.

9. The instrument I now venture on describing for the purpose of determining the height of a column of water which the force of the wind can sustain at any instant is represented in fig. 1. In this fig. *q* A*b* is a tube of glass 0·5 of an inch in diameter, and about 2·75 inches long. It is united by welding to a second smaller tube, *bcdefg*, $\frac{1}{8}$ of an inch in diameter, leaving 2 inches above the contracted portion at *b*. The smaller tube *bcdefg* is bent four times—viz., at the points *cdef*—so as to produce the rectangle *ce*, as shewn in the figure, leaving a final vertical portion *fg*: this last portion may be about 4 inches long from the last bend of the tube,—the dimensions of the rectangular portion are the following:—From *c* to *d* at the lower horizontal part *d* to *e* is 3·5 inches from centre to centre; the following vertical rise *de* is 2·5 inches; *e* to *f* at the upper horizontal arm 2·75 inches, so as to place the final vertical part *fg* about 0·2 of an inch clear of the back of the tube A. The upper horizontal arm *ef* is of such a length as to give 2·5 inches clear of the curves of the bends at *e* and *f*.

The upper extremity of the large tube A carries a funnel-shaped mouth-piece, B, (fig. 1 and fig. 2) fitted in the following way: an open brass cap *q*, terminating in a ground flange piece *r*, is cemented to the glass and projects about $\frac{1}{2}$ an inch above it. The funnel-shaped mouth-piece B slides closely for about $\frac{1}{2}$ an inch within this cap, when it is brought up by a flange-piece, *s*, similar to the former, so as to make, by the aid of a little oil, an air-tight joint. This allows the mouth-piece to be turned to any angle or to be removed when required. The diameter of the mouth-piece is the same size as the diameter of the tube A, viz., $\frac{1}{2}$ an inch, or as nearly as may be.

The whole is inlaid in a flat rectangular mahogany plate, PT, $7\frac{1}{2}$ inches high by 4·3 wide and 0·75 of an inch thick, a portion of the breadth above the glass tube A being removed so as to leave the funnel mouth-piece B, clear, as shown in the figure.

There is a heart-shaped hole, *n*, figs. 1 and 3, through the mahogany plate toward its middle and lower edge to show the bob, *n*, of a plumb line suspended in a wide angular depression cut in the plate, fig. 3: the plumb is hung from a small pin, *p*, projecting below the upper edge of the groove; the sunken part is cut triangular in its descent both ways, so as to leave the plumb quite free, and the whole is covered by a glass slide fitted in a dovetail, in order to shield the plumb from the wind. All this is indicated in fig. 3, which represents the back of the instrument.

A light arrow-shaped vane, v, fig. 1, is placed when required on a pivot inserted into the upper edge of the instrument to indicate the coincidence of the mouth piece, B, with the line of direction of the wind. This vane is constructed in the following manner. Two light pieces of brass tubing, *ab* and *cd* fig. 4, one, *ab*, of about $\frac{1}{4}$ of an inch in diameter, and one inch in length; the other, *cd*, about $\frac{1}{6}$ of an inch in diameter, and three inches in length, are fixed crossways to each other at about $\frac{1}{3}$ down from the upper extremity of the larger tube, *ab*, when placed vertically as seen in the figure; allowing $\frac{2}{3}$ of the horizontal tube to be on one side of the centre of the vertical tube, and $\frac{1}{3}$, *ac*, on the opposite side. The upper extremity of the vertical tube, *ab*, is capped with a bell metal or agate centre, to receive a vertical pivot, *ab*; this pivot is fixed in a small brass tube as a socket into the upper and fore part of the mahogany plate, so as to be removed at pleasure, as shown in fig. 1. The lower extremity of the vertical tube, *ab*, is closed by a brass plug drilled through the centre for the free passage of the vertical rod or pivot, *ab*, and by which the vane is steadied in its position. The drill is also carried through the horizontal tube internally, leaving a very free passage for the pivot. A cylinder of light wood, *acd*, fig. 4, feathered like an arrow, is inserted in *ac*, and a point of some kind is inserted in *ab*, and the whole weighted so as to balance fairly on the pivot *b*.

10. The tube A is filled with clear water tinged with a little liquid carmine up to a point, A, coincident with the horizontal line A*e*, and is graduated in the following way.

Since the diameters of the two tubes are as 4 : 1 a given displace-

ment of the fluid in the large tube, A, will occupy 16 times the space in the small tube *ce*. So that if the fluid at A be depressed by the force of the wind blowing into the mouth B the $\frac{1}{40}$ of an inch,—that will be represented on the horizontal arm, *ef*, of the small tube by $\frac{16}{40}$ or $\frac{4}{10}$ of an inch. We begin then with adjusting the fluid to a zero point, *o*, clear of the bent at *e*, and distant from the bend at *f* 2·4 inches, which is divided into 6 parts of ·4 of an inch each, each part expressing a fall of the fluid in the large tube of $\frac{1}{40}$ of an inch, when we arrive at the bend, *f*, where the fluid begins to ascend vertically, we must measure the altitude from the line to which the fluid has fallen in A by the advance in *ef*, and which, since the diameters are as 1 : 4 will be $\frac{3}{20}$ of an inch below the first level line A. But we have now to take into further account the capillary attraction of the small tube, which, by experiment, is found to be also $\frac{3}{20}$ of an inch; that is to say, if the tube A and the small tube were each half full of fluid side by side, the fluid in the small tube would stand $\frac{3}{20}$ of an inch higher than in the large tube; we have the same quantity therefore on each side of our equation, consequently they neutralize each other, so that we commence our vertical graduation from the original level line at A. In carrying up our divisions by inches and tenths, as shown in the figure, we have to consider the first fall of the fluid below the level A, viz. $\frac{3}{20}$ of an inch; therefore, to complete 1 inch it will have to asceud only $\frac{17}{20}$; but this ascent is accompanied by a further depression of the $\frac{1}{16}$ of $\frac{17}{20}$, so we must take $\frac{17}{20}$ less this quantity for the point indicating 1 inch; that is, we must diminish the altitude above A by $\frac{17}{320}$, or about the 0·0531 of an inch. Suppose, for example, we required the point in *fg* at which the force of the wind could support a column an inch high,—we must mark off $\frac{17}{20}$ inch less $\frac{1}{20}$ above the line A, this with $\frac{1}{16}$ of $\frac{17}{20}$, which the fluid at A has fallen, gives a column = 1 inch high, = 5·2lbs. nearly on the square foot (8). If we divide now into inches and tenths, in this way we have a sufficiently accurate scale from the termination of the last division in the horizontal tube at *f* round the bend to the extremity at *g*.

11. The method of application of this instrument is as follows:—Set the instrument true by means of the plumb, *n*, figs. 1 and 3:* adjust the fluid to the zero point in a still place, the funnel mouthpiece B being removed: to do this with accuracy small quantities of fluid may be required to be added or taken away; for this purpose there is a pointed glass tube, G, fig. 5, about ·3 of an inch in diameter, which admits either of adding fluid to A by small drops, or of removing it by dipping the point below the surface within the tube A, and then withdrawing it under a close pressure of the finger. We may in this way regulate the zero point with great precision; and if we close the mouths of the large and small tubes by sliding caps with compress of vulcanized India rubber, the instrument is adjusted

* In certain cases we may place the instrument on light tripod legs or other temporary fixed basis, so as to move with friction about a central pin, and thus be turned in any direction toward the wind.

for future observations,—so as to require but extremely small correction.

12. The instrument being thus adjusted, we apply the funnel-shaped mouth-piece, B, figs. 1 and 2, and if the wind be light we apply the vane, *v*, in order to be assured that the mouth-piece is fairly turned against the wind. When the force of the wind is considerable, as in what is commonly termed a "strong breeze," then the vane may be dispensed with, as we can scarcely fail to place the instrument with sufficient exactitude: after due care in observing that the plumb line is fairly central, especially for the horizontal scale, we note the position of the fluid, and take the greatest, the least, and the most steady points,—we can always fix the position of the fluid at any given instant by placing the finger upon the orifice of the small tube, and hence read off the observation at leisure. In order to facilitate the notation at the moment, certain pressures and velocities due to given points of the guage, are printed or written on the face of the instrument, as given in the following Table, which is also printed under an abridged form on the back part of it. I have computed and arranged this Table from the more elementary results of the experiments of Rouse, Hutton, and others, as already mentioned (7), so as to obtain a general result convenient and sufficiently approximative for all practical purposes as the question at present stands. The pressure column is of course to be taken as the result of actual observation.

13. TABLE *showing the Force and Velocity of the Wind from light Airs to heavy Gales, and Tempests.*

Height of Fluid in Guage, in Inches.	Press. in lbs. on Sqr. Foot.	Velocity.		Remarks.
		Feet pr Sec.	Miles pr Hr.	
0·0004	0·0020	1	0·68	Gentle breathing airs, unappreciable by the guage.
0·0009.	0·0045	1·47	1	
0·001	0·0050	1·56	1·06	
0·0037	0·0187	3	2	Extremely light airs, scarcely appreciable by the guage; would fill a light balloon calico sail of a small yacht.
0·0056	0·028	3·67	2·5	
0·006=$\frac{1}{160}$	0·032	3·9	2·66	
0·008=$\frac{1}{120}$	0·043	4·5	3	
0·010=$\frac{1}{100}$	0·052	4·9	3·3	
0·0125=$\frac{1}{80}$	0·065	5·58	3·8	Light gentle breezes; would fill the light sails of a large ship aloft, or light duck sails; usually called gentle breezes.
0·0143	0·071	5·87	4	
0·018	0·090	6·6	4·5	
0·020=$\frac{1}{50}$	0·100	6·98	4·75	
0·022	0·112	7·34	5	
0·025=$\frac{1}{40}$	0·130	7·89	5·38	
0·027	0·136	8·1	5·5	
0·032	0·162	8·8	6	
0·044	0·228	10·4	7	
0·050=$\frac{1}{30}$	0·260	11	7·6	

Table continued.

Height of Fluid in Guage, in Inches.	Press. in lbs. on Sqr. Foot.	Velocity.		Remarks.
		Feet pr Sec.	Miles pr Hr.	
0·056	0·291	11·8	8	Moderately fresh breezes, ships carry a crowd of sail.
0·070	0·364	13·2	9	
0·075=$\frac{3}{40}$	0·390	13·6	9·27	
0·087	0·452	14·7	10	
0·100=$\frac{1}{10}$	0·521	15·8	10·77	
0·106	0·551	16·2	11	
0·125=$\frac{5}{40}$	0·650	17·66	12	
0·150=$\frac{3}{20}$	0·780	19·3	13	Moderately strong breezes,—topgallant sails and royals.
0·159	0·830	20	13·6	
0·169	0·884	20·6	14	
0·175=$\frac{7}{40}$	0·910	20·9	14·25	
0·200=$\frac{2}{10}$	1·042	22	15	
0·225=$\frac{9}{40}$	1·170	23·6	16	
0·250=$\frac{5}{20}$	1·250	24·2	16·5	
0·260	1·302	25	17	Fresh winds; topgallant breezes.
0·275=$\frac{11}{40}$	1·430	26·2	17·8	
0·282	1·470	26·5	18	
0·300=$\frac{3}{10}$	1·563	27·39	18·67	Very fresh winds and moderate gales; whole and reefed topsail breezes.
0·312	1·630	28	19	
0·343	1·790	29·35	20	
0·350=$\frac{7}{20}$	1·820	29·55	20·14	Strong winds and gales; double reefed topsails and courses.
0·400=$\frac{4}{10}$	2·084	31·15	21·47	
0·500=$\frac{1}{2}$	2·600	35·32	24	
0·600=$\frac{6}{10}$	3·126	38·73	26·40	Very strong winds and storms; close reefed topsail gales.
0·700=$\frac{7}{10}$	3·647	41·83	28·52	
0·800=$\frac{8}{10}$	4·168	44·83	30·56	
0·900=$\frac{9}{10}$	4·689	47·44	32·34	
1·000	5·200	50	34	
1·500	7·800	61·18	41	Heavy gales and storms.
2·000	10·400	70·72	48·2	
2·500	13·000	79·07	53·91	
3·000	15·600	86·61	59	
4·000	20·800	100	68·18	Very heavy gales,—storms,—tempests.
5·000	26·000	111·74	76·18	
6·000	31·200	122·62	83·6	
7·000	36·400	132·18	90·12	Hurricanes, extremely heavy gales and tornados.
8·000	41·600	141·30	90·34	
10·000	52·000	157·98	107·7	Violent hurricanes which blow down buildings.
12·000	62·400	173·06	120	

14. The numbers given in this Table have been deduced, as already observed, by a careful review of the best experiments on record relative to the resistance of the air and the force and

velocity of the wind; and although not to be considered as perfectly exact for very refined calculations, is yet sufficiently approximative for the purposes of common anemometrical observation. The question is doubtless an intricate question taken in all its several details; the momentum and consequently the force of an atmospheric current must vary with the quantity of air in motion as well as with its velocity, it will therefore be a function of the density. The pressure for example of a given volume of air, moving with a given velocity, would be different under different states of the thermometer and barometer; neither is it very easy to investigate the relation of the pressure to velocity by artificial means, or even by observation, under existing circumstances; therefore, we can only hope to obtain, through the medium of such an instrument as that at present under consideration, more than valuable approximations to the truth; but which, nevertheless, must necessarily be of great importance to the progress of meteorology and extremely valuable for practical purposes. Thus, for example, we shall be always in a position to assign, by the use of this instrument, certain limits of the force and velocity of the wind under a given temperature and pressure at any given moment. If we find the fluid, for example, slightly moved beyond the zero point of the horizontal scale, we may be assured that the pressure is below 0.28 per lb. on a square foot, and the rate of motion less than 3·6 feet per second, or about 2 miles and $\frac{1}{2}$ per hour. If the fluid somewhat exceeds the 4th division of the horizontal scale, the force will be greater than ·5 of a lb. on a foot square, and less than ·78; and the velocity be beyond 15 feet in a second, or beyond ten miles in the hour, and less than 17 feet in a second, or about 12 miles in the hour.

15. It is probably, from the differences liable to arise in the momentum of the air by changes in its density, that somewhat different results may have been arrived at by various observers. Thus, Borda found, that air moving at the rate of a foot in a second pressed with the $\frac{1}{500}$ part of a pound on a foot square; that is, with a force of about 14 grains. According to Rouse, it would be the $\frac{1}{400}$ of a pound, or about 17 grains. The experiments of Hutton give nearly 14 grains. The above Table has been computed at something less than Borda and Hutton's results, which may be more exact than those of Rouse; but still not so exact probably as to warrant us in leaving Rouse's observations out of our calculation altogether. I have taken the unit of force at an inch pressure on the guage, which corresponds with a pressure of 5·2lbs. nearly on the square foot, corresponding with a velocity of 50 feet in a second, or 34 miles in the hour very nearly, and which would correspond with a force of the $\frac{1}{480}$ of a pound on a foot square, with a velocity of one foot in a second; that is, to a pressure of 14·5 grains nearly. With respect to velocity, it is pretty generally agreed by all the observers, that the pressures are as the squares of the velocity, or so nearly as to warrant us in using that proportion for general purposes. According to Hutton, the resistances for high velocities increase in a somewhat greater

ratio than that of the surface opposed to the wind: supposing the surface constant, say a foot square, we shall not greatly err in taking the force in the duplicate ratio of the velocity, or the velocity as the square root of the force.

16. In deducing results from observation with the guage, we may always find the total amount by simple arithmetical calculations. Thus, the force with a column of ·5 is one half that of 1 inch; the force due to a column of ·3 is three times that of 0·1, and so on: 3 divisions and $\frac{1}{2}$ on the horizontal scale would be $\frac{1}{40}+\frac{1}{40}+\frac{1}{40}+\frac{1}{80} = \frac{3}{40}+\frac{1}{80} = \frac{7}{80}$; so we have only to multiply the force given in the Table for $\frac{1}{80}$ or ·0125 by 7, and we have the resulting pressure, viz., ·0875lbs. on the square foot, which, taking the velocity as the square root of the pressure for the unit of velocity and force=1 inch=5·2lbs. and velocity 48 feet in a second, would be about 20·5 feet in a second, or something less than 14 miles in the hour.

17. In the construction of the instrument as above described, it will be requisite to have the glass tubes of a regular bore and of the exact dimensions given: viz., for the large tube $\frac{1}{2}$ inch diameter, for the small tube $\frac{1}{8}$ of an inch, and not more nor less, so that the diameters may be as 1 : 4. The dimensions also in length of the bends should be nearly as described, otherwise the same graduation will not apply. Other relative proportions may of course be employed, but I have found by experiment those given to be the most convenient and available. The only difficulty at all likely to arise in the observation, is the requisite care to have the instrument vertical for the horizontal scale; but this can always be sufficiently well managed by attention to the plumb, and since the horizontal scale applies to very moderate and light winds, we may always hold the instrument sufficiently vertical and steady. In heavy breezes slight deviations from the vertical are not so important; still it will be desirable to hold the instrument as vertical as is possible.

18. When the instrument is employed on shipboard, it will be of course requisite to make due allowance for the velocity of the ship should she be under sail or steam, and in what direction sailing in regard to the direction of the wind. When the ship is moving either directly against or with the wind, we have of course to add or subtract the velocity of the ship from the observed velocity.

19. The motion of the ship itself has but little influence on the observation, in consequence of the smallness of the lesser tube and a little contraction of the bore at one of the angles of the bends, which is quite sufficient to arrest any oscillating motion of moment. In light winds measured on the horizontal scale the ship would be usually steady.

6, *Windsor Villas*, 1*st February*, 1858.

[Having inspected this instrument of Sir W. Harris, it appears to us not costly and most simple and effective for the shore, where it will no doubt soon be in use; and when *carefully* used afloat it would yield results of real value in comparison with the present empirical mode of registering the force of the wind.—Ed.]

Loss of the Barque "Mahaica," *of Greenock, Scotland, on the Coast of Australia, and Narrative of the Sufferings of her Crew. By Edward Duncan, Seaman, one of the Survivors.*

(Concluded from page 66.)

Finding ourselves in such good quarters we determined to stop where we were and made up a blazing log fire, which enabled us to pass a much better night than the previous one. In the morning we held a consultation before proceeding as to our route, whether it should be to the South or to the Eastward and so try to gain the beach once more. We settled the point by going eastward, and started after eating a few nuts, taking a drink of water, and refilling our measure. We continued walking until about ten o'clock in the forenoon, when we discovered a bush or kangaroo rat sitting in a hole in a tree. One of us having a sheath knife immediately killed it and it was speedily divided into six parts, which we devoured with much relish; after which we continued on our journey until about four p.m., when we came to a salt water river much broader than any we had yet crossed. This we considered we were unable to swim over from being so weak, and we followed its stream until sunset, when we made our supper of some more of our nuts, taking our lodging by the river side until morning dawn, when we again got on our legs.

Trusting that we might come to a narrow part of it, we continued to travel along its banks, eating our nuts, when about eleven in the forenoon we found some wild beans. Taking some of them we continued onward, but we were soon alarmed by seeing a large volume of smoke overtaking us, and on turning round we saw the whole bush in flames behind us and to our left hand. Seeing this awful fire overtaking us, and having no other way of avoiding it, with one accord we plunged into the river and all landed safely on the other side—showing what fear will do. The flames were at the water's edge about a quarter of an hour after we had crossed, so we sat down and surveyed the fire, which was most gorgeous. We concluded that some fire had been blown so strongly by the wind that it had ignited the dry grass.

While we were now speculating as to the course we should take we saw several natives coming along following up the fire, and we afterwards learnt that it is a common practice with them to do so in order to frighten opossums and other small animals into the trees, so that they may catch them more easily for food. As soon as they came within hail we shouted; they looked, but instead of replying they all rushed away and continued running until out of our sight. This we could only impute to fear, and yet it appeared strange as there were so many more than ourselves. We were much disheartened at this, and so laid down and remained on the river's bank all night.

On the seventeenth day of our wandering we again held a consultation whether to continue down the river or cross again and turn back and try to fall in with the natives. It was eventually settled that we

should go forward; so we got on our legs again to make another start, but one of the party having got a thorn into his foot two days previously was in such pain that he could scarcely drag one leg after the other. Even at the crawling pace we now travelled his foot had swollen so much that our captain was afraid we should have to leave him behind. The poor fellow, sick at heart and suffering, begged of us to kill him and so put an end to his misery. But of course none of us would do this.

As we walked slowly onwards we saw a lot of small crabs crawling along the side of the river. Some of these we caught and ate greedily, but as the river was salt we now suffered much from thirst. After passing the night here, as soon as the sun rose we started, all of us feeling very ill. We searched for water, but had almost despaired of finding any when happily we came upon a water-hole on the edge of the scrub a short distance from the river. We each had a good drink and laid down and slept well.

On the nineteenth day we resumed our wanderings and travelled until two in the afternoon, when we came to two water holes and rested for awhile, drinking profusely of what we considered was the best water we had ever tasted. While lying on the ground we saw a number of shell-fish in the water: obtaining some, we made a good meal and found them very strengthening. After a good rest, though sorry to leave such good quarters, we went forward comparatively strong and hearty after our meal and refreshed for our journey. Striking inland, in about three hours we came to another river, much larger than any we had before seen. While looking for a good crossing-place we observed several foot prints and other marks, showing plainly that some human beings had been there and that lately. There were also other prints as of dogs, so we concluded a tribe of natives had passed that way.

It was immediately proposed to our captain that we should follow this track instead of crossing the river. He agreed, and thought, should we not reach a native encampment, we might at all events gain the sea beach. After following the track some distance we came to a river branching off from the main one that we had been going along. Without more ado we plunged into the water and commenced swimming, and found ourselves so weak we could scarcely get across. But the poor fellow whose foot was bad was very nearly drowned; as it was he had to let his clothes go in order to save his life, so that he had not a rag to cover him when he landed on the other side. We gave him a piece of blanket which we still had and he tied it round his middle. We got on the track and the captain was of opinion that the river must lead to the beach, as he thought the natives seemed to follow it for a sort of man road, judging from the numerous footmarks we saw Travelling until sunset we stopped for the night by the river side. though we slept but little.

The next morning as we were about starting one of us saw a small fish in the water and soon after we saw quite a shoal of them. We racked our brains to devise some plan for taking some of them, and

we decided to lay the piece of blanket flat under the water and on any fish passing over it to draw it up quickly. This succeeded pretty well and we caught enough fish for breakfast. As it was yet early, after cooking them we walked on for an hour or so before eating, as we had devoured a few while fishing. We had not proceeded more than a mile when we descried some smoke rising from a place just within the bush, so we pushed on for it hoping to fall in with natives. We hastened on full of hope, but when we reached the spot we were disappointed to find only signs of their having been there, and that but recently, as there were two fires still burning and they had left their mi-mis standing.

We looked about for pieces of food, which we thought they might have left, but found nothing except fish bones. There was, however, a large water-hole close at hand, and we thought it would be better to remain that day as there was plenty of water near and fish for the catching. The fish, we found afterwards were of the kind commonly called toad-fish. On finishing our meal we laid down in the huts or mi-mis and slept soundly; but as there was not room for all in one hut we divided our party, the captain, cook, and steward sleeping in one hut, and the second mate, myself, and another sailor taking the other. After being asleep about three hours I was aroused by the sailor, my companion, complaining that he felt very sick and uneasy at the stomach, and on attempting to raise his head he felt quite light-headed and declared he must be poisoned, and laid the blame on the toad-fish. He could neither stand nor sit, but remained lying on his back. I thought it best to arouse the second-mate, and we then did all we could to cheer him. We did not consider him poisoned, but thought he was going mad as our former shipmates did who had died; but I soon became convinced that his statement was true, and the second-mate and I got up and went to tell the captain of his sickness. The captain was sorry to hear this and hoped he should not have to leave any one behind.

The strongest of us then went to the river in search of more fish, and succeeded even beyond our expectations. On returning with the spoil our shipmates greeted us joyfully at our success, and we immediately began to cook them, and relished our meal most heartily. Our sick shipmate, however, was too unwell to take any.

After finishing our meal we thought it would be better to remain where we were as we had both food and water, and our comrade was so ill he could not have travelled. I had not been lying down long before I felt ill also and fancied I had the same symptoms that my shipmate had described. So I at once roused the second mate and told him and the other man (McFee) how ill I felt. The latter complained, saying he felt much worse, and the second mate said he also felt ill,—so now we all three were laid on our beam ends. I thought it best to see the captain and the other two at once, so tried to rise, but I could not have stood on my feet had my life been depending on the same. I firmly believed my hours were numbered and felt a secret satisfaction, as the sufferings we had gone through and the pros-

pect of their continuance were enough to make any one weary of such a life. However, I managed to crawl on my hands and knees to the captain, though it was with great difficulty I succeeded in reaching his mi-mi. I found them in a similar state to ourselves, though the cook was the greatest sufferer,—indeed he seemed quite mad. On telling the captain I felt as if I had taken poison, he said, "So do I, Ned, in fact we are all poisoned."

I laid down for a quarter of an hour beside him, and then rose to my hands and knees, and, although excessively weak, I managed to crawl to the water-hole and drank as much water as I could, hoping to be sick, but it was quite useless. I now filled the measure I had brought with me, and after several attempts succeeded in crawling back to the captain's hut, having fallen and rolled over from sheer weakness several times on my way. On reaching the hut, the captain looked towards me, saying, "Ned, the poor cook is dead." He then wished me to go back to our hut and see how they were there. After some time, I managed to reach it, and found them alive and crying like children. I told them the cook was dead; on hearing which they asked me to sit down by their side. They each then told me where their friends resided and some of their secret thoughts, saying at the same time they were sure I was the only one of the party that would survive, for I was the strongest. After this distressing scene I again crawled back to the captain and told how I had found the others, when he said it would be best to tell the second mate and his fellow sufferer to come to his hut if they possibly could, so that we might all die together.

Accordingly, I crawled back, but had to rest from exhaustion several times, so that I was some time reaching the hut; where I found my companions in a dreadful state of suffering. They were quite speechless, while their eye-balls and tongues were protruding from their heads.* * * * We lay thus some time, when we got a little sleep, and woke the next morning in better health.

We commenced our twenty-first day by crawling towards the fires, which were fortunately still burning. We felt much better, but as we had not yet got the use of our legs we thought it better to lie down again, so as to gain strength if we could. After a drink of water we did so, and slept for some time, waking about twelve o'clock feeling much better, and on rising found we could stand on our legs. But as we could only walk a few yards we thought it best to remain where we were for a day or two to regain strength, and we laid down again until noon. We then felt much stronger and determined to proceed on our journey instead of remaining until the next morning as originally intended. So we each took another drink, filled our measure, and made a start once more, and by resting occasionally we got on much better than we could have expected.

The captain and myself were walking ahead and I had just said I

* A portion of the journal is omitted here, as detailing a state of suffering and recourse in it that we forbear to publish.—Ed.

thought we should soon gain the beach, which from the air and the appearance of the ground I thought likely, when he sang out, "Ned, look! look, Ned! there's an opening, it must be the sea-beach." We hastened on as fast as we could, and found to our joy that we could see the ocean. I believe we should have died from disappointment had we not reached the beach. We were now full of hope that by following along the beach we might come to some small harbour on the coast. We had not proceeded very far when we saw the bones of human beings and the remains of two vessels; which from appearances we judged must have been there some time. We also observed some footmarks, which we traced and followed and in half an hour we discovered four native men ahead of us; but before we reached them they turned round and fled.

We were sadly disheartened at this, as they appeared to be afraid of us, seeing our wretched appearance. We had not gone far when we discovered some smoke issuing from an opening in the bush. We pushed on for it as quickly as possible, thinking that if there were no natives at all events we should have a fire to sleep by, which would be better than remaining on the beach all night, for we could not fail in finding the beach again, as the fire was only a short distance. We soon reached it, and found to our astonishment a party of twenty men, women, and children, all natives. They appeared to be much alarmed at the sight of us; the women screamed, and all attempted to retreat as quickly as possible, catching up the children in their arms. We at once motioned them to stop and called to them, for by this time they had got some distance from us. They stopped and took a long earnest survey of us, and after much chattering among themselves they appeared to come to the conclusion that we should do them no harm, as we really were human beings.

After inspecting us they came closer, and kept on chattering away and patting us on our backs. They did not at first comprehend we had been suffering, for they laughed until they fairly jumped again,—our appearance no doubt being to them somewhat ludicrous. After their merriment had somewhat subsided we endeavoured to make them understand what we had gone through, and they soon began to comprehend our meaning, and as the old women and the others learned our story by signs they cried like children, appearing very sorry for us. We made signals that we wanted food, and they immediately sent the children to get some shell-fish from the beach. These tasted something like the wilks we have in England, and our friendly natives seemed to have no other kind of food, or no doubt we should have been heartily welcome to it, for they now became very friendly, and we were delighted to hear them speak a few words in English. We afterwards learned that they were in the habit of going occasionally to Wide Bay for blankets, tobacco, and flour, in exchange for skins and rugs.

They told us they would guide us to Wide Bay; of which we were very glad. Their reply to our question of where English people lived was "White fellow live Wide Bay." Now, sure as we were

of being saved, we did all they wished us. They told us to lie down and sleep, as Wide Bay was "plenty long way, and we should get plenty tired." So, knowing that we had yet a long journey before us, we laid down and took a good rest, for we were very weak and exhausted.

Towards nightfall these natives gave us another meal of shell-fish and swamp root, the fish from the beach and the roots dug from swampy ground by the women. We found the latter very pleasant eating, for they much resembled and tasted like yams. After a very hearty meal we laid down and had a good sleep again, though we felt uneasied by the presence of the natives, for they appeared to be such an awful wild and savage lot; but we reposed in peace and comfort that night.

Our twenty-second day was commenced by the natives arousing us and telling us that two of their party were ready to conduct us to Wide Bay. On hearing this we lost no time in reporting ourselves ready. The two guides selected for us were fine-looking fellows about twenty-five or thirty years of age. They were very strong and muscular, as shown by the prominent muscles of their legs and arms.

They wore no clothing, nor were they tattooed or painted as others; and for weapons carried their spear, waddie or club, and tomahawk or small axe: the waddie is used for climbing trees and killing small game. Above all, they rejoiced in the English names of Billy Wapper and Tom Bluff; which names they took great pains to explain to us, for at first we thought they were speaking of some English people. After bidding the remainder of the tribe good bye, we started with our guides, who at once came on to a beaten track through the heart of the bush.

After seeing us on it, they kept running from side to side of us in the scrub, peeping into holes in the trees, and going on as a dog would do when hunting. They caught several wood worms and large maggots, which they immediately gave us to eat. About eleven we came to a water hole, had a good drink, and rested for a short time. Before making a start, we were going to fill our measure again from the water hole, when Billy Wapper came to us and said, "Bail," making signs for us to leave the water, and that "by and bye there plenty water." While going along the track, our captain made signs he had seen a centipede, which he caught, and was going to eat, when the natives threw it away, saying, "Bail budgeree," which meant, no good, so it was not eaten.

We continued travelling until about four o'clock in the afternoon, when our guides observed a very large snake, about five feet long, and about forty feet up a tree. As soon as the guides saw it, we thought they would have gone mad, for they commenced leaping about, making antics and laughing. Then they came to us and pointed their fingers to our mouths, saying, "Plenty tuck out." And they now commenced operations for securing the snake meat.

Billy Wapper, who was the older of the two, made ready to attack. He placed his tomahawk between his teeth, and commenced ascending

the tree, by digging out a piece of the bark with the sharp end of the waddie. In this indentation he inserted his toe, then made another hole inserting the toe of the other foot, leaning against the tree with his left arm, and supporting himself until he reached the snake. Tom Bluff remaining stationed at the foot of the tree, he commenced by aiming a heavy blow at his head, but missed his aim, and the snake immediately made a most savage dart at Billy, who, with the utmost unconcern, dodged behind a branch of the tree, then quickly aimed another blow, which nearly killed his majesty. He then chopped off the branch, which fell with the snake coiled around it to the ground. Tom Bluff now struck it some heavy blows on the head, at the same time dodging when it made the slightest attempt to sting, and also watching that it did not sting itself in its agony and rage, which would have poisoned the meat, and rendered it unfit to be eaten.

Billy now descended, pointing to his mouth, and capering about, meaning that we soon should have plenty to eat. Tom Bluff now kindled a large fire, and then he and Billy laid hold of the snake, one at each end, and carried it to the fire, on which they laid it for about ten minutes, he all the time twisting and turning it about until it was quite dead. They then carried him to a small tree, when, taking a single turn round the tree, they commenced rubbing him until all the scales were rubbed off. They then laid it on the fire again, and in about forty minutes it was fit to eat. After it was thus cooked, they laid it on a small fallen tree, and pounded it up into mince meat, and then divided it into equal shares. The gall they took great care of, putting it into a leaf, and divided it between them, giving us to understand that the gall was good for the eyes, and made them see quickly.

We now recommenced our journey, about five o'clock, and went ahead as quickly as possible, as we were tired and wished to come to our camping ground. In the evening Billy Wapper ascended a tree and quickly threw down a couple of flying squirrels, which we immediately killed; he also found a quantity of wild honey, which was no sooner thrown down than we pounced upon it, and it immediately disappeared. Billy came down quickly, but was too late for any of the honey. At this he lost his temper, and without more ado raised his tomahawk, and I received a heavy blow which I warded off the captain. Billy looked at me in a most savage manner, but nothing more occurred, as the height of his passion was over.

We now proceeded silently along the track, and after walking about a mile, our guide gave a loud shout or cooey, which was answered. They now hurried on faster than ever, seeming to be anxious to get on, and we soon came up to three native women and two men, who were busily employed in roasting kangaroo rats and opossums. This they did by throwing them in their skins, hair and all, on the fire, and when about half cooked they tore them to pieces with their hands, and ravenously devoured them. On first seeing us they were greatly alarmed; but our guides soon made all right, on which they were very kind in offering us food; and as there was a water hole at hand, we

had plenty to eat and drink. Billy Wapper had by this time regained his temper, and we made a comfortable merry party, all laughing and joking together; and this was followed by a comfortable night, for we slept more soundly than we had done for some time previous, and at daybreak arose quite refreshed.

After taking leave of these very friendly natives, and loading them with promises of reward at some future time, we proceeded on our way, which Billy told us would be completed that day. Our hands, arms, and feet were most dreadfully torn by the bushes through which we had passed, and we found it impossible to travel as fast as our guides required us to do. We now came to a creek, known as the Salt Water Creek, and they made signs we must swim over. They secured our clothes on their heads, and then swam across with us, after which we immediately made a fire, warmed and dried ourselves, and then dressed. Here I discovered some cattle tracks, and immediately told my shipmates. The very sight of them filled us with joy, as we considered them a sure promise that we should soon be among civilized beings again. They encouraged us to push on with renewed vigour, and we were continually and anxiously asking Billy how far we had to go. His reply always was, "Close up."

However, about eleven in the forenoon we came up to a party of natives. Billy went towards them, and after some conversation had passed, he returned, bringing a pipe; each had a smoke in his turn, and as we had it were knocked over by the strength of the tobacco; but we supposed this was the consequence of our weak state. We were obliged to lay down for about twenty minutes in order to recover from the effects of the tobacco, and after thus resting we recommenced our travels, and soon came on the track of a dray. The steward ahead of us, who was a black and native of Barbados, commenced singing and dancing, and shouting out most joyfully, said he saw some houses. We at first did not believe him; but on coming up to him we were so overjoyed by the sight of several, that our strength almost forsook us, for we felt weaker than we had done all the way, and sat down to recover ourselves; but the captain and another of us being too weak, had to be assisted into the village by the two guides.

On our reaching the village, the inhabitants came out in flocks to see us, and several of them thought we must be the remainder of the crew of a Dutch ship wrecked on the coast, by which we found it was probable we were not the only shipwrecked wanderers in the bush. Having learnt from us that we belonged to a Scotch ship, they conveyed us as quickly as possible to the Bush Inn, kept by Mr. Aldridge. On our way to the inn one of the villagers offered us some rum, which we foolishly drank, and became almost immediately intoxicated; but after lying down at Mr. Aldridge's a short time we recovered. We were then taken into a room, on entering which we caught sight of a loaf and a basin of sugar on the table, at which we made an instantaneous rush, and as quickly devoured it.

The inhabitants of Wide Bay flocked in scores to the Bush Inn, as they would have done to a raree show, to get a sight of us, and to hear our story, and almost killed us with kindness. Our landlady now

brought in dinner, consisting of soup, roast beef, potatoes, and cabbage, off which we made a very hearty meal, though nothing like I expected we should have done. After dinner, some port wine was brought; we drank, it, and shortly after began rolling about on the floor in great pain, occasioned by taking so much food after so long an abstinence, it being now about the thirty-second day since we had taken a good wholesome meal. Perhaps rolling on the floor did us good, for we soon fell into a sound sleep, and afterwards washed and clothed ourselves from head to foot, our kind landlady having provided clothes for us from the villagers. A surgeon also attended and dressed our bruised limbs, directing us how to live for the first few days, until we had gained some strength, and our stomachs had become accustomed to food.

While seated in the parlour conversing, tea was brought in; it consisted of cold meat, bread and butter, and tea. We again made a very fair meal, after finishing which we sat down and spent the rest of the evening talking of our past sufferings and our future prospects. The principal people of the village were there hearing our tale; in fact, the house was not empty for some days after our arrival. At nine o'clock we all turned in, but sleep we could not for excess of joy at the extreme change for the better in our circumstances. Next morning we were about at eight o'clock, though we had so enjoyed our comfortable bed that we still felt loth to leave it.

After partaking of a good breakfast, we sallied out for a walk through the village of Maryborough. We could scarcely move a yard for the people stopping us to ask how we were and have a yarn, so we gave up our walk as a failure, and shortly returned. Our captain had a room to himself the front parlour, while we had the back. Amongst others who called to inquire about us were two clergymen, one Protestant and the other Roman Catholic. In the cause of humanity they joined hands, and went about amongst the inhabitants raising a subscription for us, which amounted to some thirty shillings each, and with which we purchased a few necessary articles. The natives Billy Wapper and Tom Bluff were not forgotten, and were presented with a silver medal each with a suitable inscription, commemorating the service they had done us. They also were supplied with what they prized much more, some blankets and tobacco, as an encouragement to act towards others as they had done to us With these and some other small articles they appeared much delighted, and we shortly took leave of our humane preservers, men, who though they wore a black skin, had hearts which would have done honour to an exterior of any shade or colour.

The only person in Maryborough who at all gave us the cold shoulder was the magistrate,—the man "armed with a little brief authority," and one who of course considered himself a most consequential personage. He came to the captain the morning after we had returned from our walk and took down the ship's name, date of her wreck, and all particulars. After conversing with the captain he came to us, but as he did not choose to notice us on our arrival, we would not now be questioned by him, and referred him for all particulars to our captain.

Seeing he could get no information from us he soon took the hint and made himself scarce.

One of our shipmates now began to complain of sickness, the chief symptom being a severe pain in the side. The surgeon was called in, who told him to be of good heart and he would soon be well again. He said most likely we should all suffer in the same manner, as it was the result of our hardships.

The captain was now anxious to get to Sydney, and as there was a schooner called the *Jenny Lind* lying at White Bay which was to sail the following day for that place, he went in her, accompanied by the steward and one of our companions. Their passage was paid by the people, they having raised another subscription for that purpose; and they also kindly offered to pay the passages of those remaining if we wished to go, but we thought it best to remain for a while where we were, as we could get light work ashore, and get up our strength before we went to sea again. We therefore accepted a berth in Mr. George Walker's ship-building yard, at the wages of twenty shillings per week, with board and lodging. After working here for three weeks, and feeling quite strong again, the captain of the *Albion* schooner gave us leave to work our passage round to Sydney; which we gladly did, though our kind friends at Maryborough were sorry to part with us, and would have given us constant employment if we would have stayed. After taking a friendly leave of them we sailed, and arrived in Sydney after a passage of fourteen days.

On our arrival we repaired to the Liverpool Arms inn, at which our former captain and shipmates had put up. We here learned that the captain and steward had left for Melbourne; but poor Phillips, the man who had complained at Wide Bay, had been dead about nine days. The captain had also been ill and confined to his bed. Neither he nor the steward have I seen since. I remained at Sydney three weeks, when, feeling sufficiently strong to do duty as a seaman, I shipped in the steamer *Cræsus*, bound for Southampton, which is my native place; where we arrived after several disasters in 109 days.

I now finish my story, which I can assure my readers is not like many of those which are told by seafaring people, but is an "owre true tale,"—all true from first to last. I have served in H.M. navy nine years, during which time I was in several engagements in the China Seas where many lives were lost, and many dreadful scenes have I witnessed; but none of them at all equalled or formed a tithe of the sufferings which I underwent in the wild, wild, starvation bush of Australia.

[The foregoing narrative is the production of a British seaman, whose acquaintance with letters is but slender, or the sufferings he endured with his companions and the scenes which he witnessed would have expressions and descriptions far different to those which his small stock of erudition has enabled him to commit to paper. In preparing his narrative for its place in the *Nautical*, it has undergone the least amount of alteration that was consistent with the rules of grammar, and therefore it conveys a "plain unvarnished tale," every word of which, as he says himself, bears with it the stamp of truth.—ED.]

Chronometers and their Makers in England and France.

From the time of the Phœnicians to the invention of the compass, the discovery of America, and the early voyages round the Cape, navigation may be said to have been in its infancy. From the solution of the problem of the longitude, as well as the improved application of the arts and sciences which have combined to effect the safe guidance of ships across the ocean, and especially since the contribution of the chronometer to navigation, has commenced that boldness and security with which the navigator explores the globe.

The object before us now is to allude to the great value of the chronometer to navigation, considering the results obtained by it already, and how much it has contributed to the advancement of astronomy, hydrography, &c.

The observatories of Paris, London, and Berlin publish annually in their nautical ephemerides, with mathematical precision, the astronomical elements necessary for the performance of different nautical calculations. The French, English, American, and Spanish Governments have published the most complete charts—the production of their seamen, besides the nautical works of those celebrated mariners, Roussin, Freycinet, Baudin, Owen, Gautier, Horsburgh, have again facilitated the exploration of foreign seas by making known in their instructions submarine dangers, the set and direction of currents, as well as the winds which prevail at different times of the year. Again, distinguished artists, such as Spencer, Borda, Jecquer, Troughton, Norie, and Gambey, have furnished seamen with instruments which leave nothing to be desired, and as pioneers of navigation merit our gratitude and admiration.

Horology, by providing the seaman with the chronometer, completes the series of important contributions and supplies him with the means of determining the longitude, mostly to be appreciated perhaps when he is approaching the coast in high latitudes, where the state of the weather is unfavourable for obtaining lunar distances during the greater part of the year, as in our climate.

Previous to the use of chronometers in navigation, notwithstanding the progress which had been made, it was but seldom that the commander of a ship could foretell with certainty that land would be seen at a specified time. This uncertainty of making the land at night has obliged him sometimes to lay by a considerable distance from it; or at others, as in the West Indies, has been the cause of his running past it, a circumstance which has frequently occurred there. Such were the consequences of erroneous positions in the absence of lunar observations. In the first there was a loss of time in making the port; in the second it was necessary for doing so to beat up against the current, and it was only after several days of tedious navigation that good sailing vessels were able to do so, while a great number of bad ones were obliged to return and start afresh, thereby losing a month or more in doing so.

Similar results have occurred to ships going to the southern hemisphere from having crossed the line too far to the westward. They, again, have been embayed on the coast of Brazil about Cape St. Roque, without being able to weather it.

To chronometers belong the great merit of doing away all those impediments to navigation when lunar observations are not to be had. Ten times a day, if desired, the longitude may be obtained by them, provided the sun be visible only for a few seconds for the observations, and the results are obtained by a few minutes of calculation. When the chronometer is good the real longitude is thus obtained; but, on the contrary, in lunar observations, however correct the observer's eye may be, a heavy sea, a violent motion, or a cloudy sky may affect his observation and produce a serious error in the longitude, besides which the calculation by this means is long and laborious; it is likewise not every navigator who is a good observer, and if he is and has not a good instrument the obstacle is insuperable. Under such considerations the science of horology claims the protection of seamen as well as governments, since it always secures the safe navigation of ships.

England, essentially a maritime nation, has long been well acquainted with the necessity of having good chronometers for her seamen, and has for many years bestowed first-rate rewards for the best chronometers, and her example has been imitated by France. Indeed, the unceasing efforts made by England in this respect have obtained for her the supremacy over all other nations in the art of horology, and she has even now but one rival—that of France. England may refer with pride to the names of Harrison, Poole, Parkinson and Frodsham, and Charles Frodsham; and France can also point to Tully, F. Berthoud, P. Leroy, Breguet, and Winnerl: but of all these celebrated artists there remain only two men to represent in France and England the grand science of horology—Winnerl and Charles Frodsham. The Exhibition of 1855 decreed two gold medals for the best chronometers, and these were obtained by these two makers, whose chronometers called forth the admiration of all competent judges by the extreme regularity of their performance.

In this imperfect view of the subject of chronometers may be perceived the great service which they render to science, and with what satisfaction captains of ships on long voyages may confide in them. In fact, when they are good they become to them infallible guides, and are a sort of provident safeguard. It should not be forgotten that the loss of ships and men, as above shown, might be, on the contrary, the result of not having them. But it is much to be desired for the sake of mariners generally that every ship going on a long voyage should be provided with them, and then only with good ones. Better, indeed, would it be that a ship should be without them than that they should be bad ones, for then the confidence which is placed in them may occasion the most disastrous results.

We find the foregoing in a recent number of the *Moniteur de la Flotte* from the pen of a naval officer, *Capitaine au long cours;* and, agreeing with him as we do in attributing so much value to that first-

rate work of art, in its application to navigation,—the chronometer, we would follow up his good intentions in publishing its great merits, and making known the representatives of the art of chronometer making in this country, as well as he has done in France.

Since the days of the father of chronometers, Harrison, whose first great work (for which he received a reward of one thousand pounds) remains the monument of his fame in the Royal Observatory at Greenwich; and since the days of Mudge, Earnshaw, Arnold Senior, Brockbank, and Arnold, with whom was connected the late Mr. E. Dent (represented now by his successor, Mr. F. Dent,) the art of chronometer making has been wisely encouraged in this country; and the consequence may be briefly alluded to in its good effect on geography and its sister science, hydrography, as well as the security and celerity of navigation.

It is very well known, and was to be expected, that chronometers in their early days, like other productions of art, being rare and scarce, justly obtained high prices. Happily, they came in time to be of service to Cook, Baudin, Vancouver, and other celebrated navigators, whose discoveries owe to them the great merit of correctness; and they continued to be patronized, notwithstanding their costly prices, to a certain degree throughout those troublesome times which concluded with the peace of 1815. It was then that the arts and sciences received encouragement, and among them the chronometer, which had already rendered excellent service, could not be forgotten.

In 1822 the Government of this country renewed their encouragement to bring the chronometer to perfection; and with this view, besides making it more common in the royal navy (for many of the few employed in H.M. ships were the private property of their captains), assigned an annual sum of £500 to be divided between the two best chronometers,—to the first being assigned £300, and to the second £200. In 1828 the same sum was divided among the *three* best,—to the first being assigned £200 and to the two next £150 each. And in 1837, when it was seen by their performances that chronometer making had attained its then maximum of art, the premium system was discontinued; but the annual trial at the Royal Observatory, by which the merits of chronometers had always been determined, was continued as originally established in 1822 under the charge of the Astronomer Royal.

The general effect of this excellent measure of the Government was plainly visible. As the chronometer gradually became general, navigation and foreign trade improved, and along with it the scientific attainments of seamen, besides all branches of science to which they could contribute. But the great good produced by the encouragement rested not here. In proportion as chronometers increased the demand for them necessarily increased also, and thereby the number of makers; and hence was established an important and numerous branch of trade. Nor did it even end here, for the Government by reducing the amount of the premiums for them gradually established the price which the good chronometer should cost the seaman. This was indeed rendering

him a service, and, through him, securing a real benefit to the country,—and thus the price of the chronometer became that at which it has remained ever since, viz., forty guineas.

The names of those celebrated makers given above are naturally, in the early condition of the chronometer, connected with high prices,—such indeed as were far beyond the means of seamen in general. But there is one of them—the late Mr. E. Dent—to whose memory the seaman will always owe a debt of real obligation as having been chiefly instrumental in this good work for his country. At the period to which we allude something not far short of a hundred pounds, varying to eighty, was the price of the chronometer, when Mr. D. offered to the Government and the public the best chronometer that could be made for forty guineas. This it must be allowed was rendering a service to his country. By doing this he enlarged the boundaries of the trade, chronometers were employed where they had been unknown, and their makers and other workmen necessarily became still more numerous. This gentleman of whom we are speaking has happily left his successor, the present Mr. F. Dent, whose liberal views are those of his predecessor, and who may be safely looked on as one of the first representatives of the art of chronometer making* in this country. All honor then to the name of *Dent*, and let seamen never forget that it is a name as intimately connected with the chronometer, by placing it within *his means*, as that of Redfield is by introducing to him the hurricane theory.

Thus have the views of the *Capitaine au long cours*, in the *Moniteur de la Flotte*, been followed up in the encouragement of the chronometer, and we fully agree with him that a bad chronometer is worse than none. But where numbers are required *all* can scarcely be expected to be good: there must ever be degrees of merit in chronometers as there are in mankind generally. What is to be done then is to submit them to trial such as that which takes place at the Royal Observatory.

With this view the following process is pursued:—The chronometers for trial are lodged at the Observatory at Greenwich in the month of December every year; where their daily rates are noted under changes of temperature varying between a freezing cold and a high tropical heat; so that they undergo a winter and summer process of comparison daily by the month of July or August. Their performances under these circumstances are recorded and published by the Astronomer Royal, and their degrees of merit severally reported.

We now annex the names of the makers from whom purchases of their chronometers have been made for the use of H.M. ships by the Government under this system from these trials at the Royal Obser-

* We may also add of the art of horology in general, Mr. E. Dent was the maker of the beautiful clock of the Royal Exchange; and that which is in course of construction for the House of Commons, well known to be on the largest scale yet made, is in the hands of his successor, Mr. F. Dent, of the Strand.

vatory, commencing with that of 1850 to that of last year, arranged alphabetically, merely adding that the highest price paid to either of them has been fifty-seven guineas and the lowest forty.

Names of the makers of those chronometers on the annual trial at the Royal Observatory that have been purchased by Government for the use of the Royal Navy:—1850, Dent, Eiffe, Loseby. 1851, Loseby. 1852, Appleton, Dent, Massey. 1853, Lister. 1854, Dent, Eiffe, Glover, Poole Reid. 1855, Dent, Frodsham, Lawson, Poole. 1856, Muirhead. 1857, Hornby, Poole, Muirhead.

And the following list shows the number sold by each maker to the Government from the same trials. Appleton, 1; Dent, 4; Eiffe, 2; Frodsham, 1; Glover, 1; Hornby, 1; Lawson, 1; Lister, 1; Loseby, 2; Massey, 1; Muirhead, 2; Poole, 3; Reid, 1.

Thus if France has produced her Tully, F. Berthoud, P. Le Roy, Breguet, and Winnerl—leaving the last as the representative of the art in that country, England has produced her Harrison, Mudge, Earnshaw, Arnold, Brockbank, and Dent, besides those in the foregoing list, who may safely be considered as representing the art in its present condition in this country.

Why Watling Island was the Landfall of Columbus *on his First Voyage to America in* 1492.

A short time ago it fell to the lot of the Editor of this journal to clear up the long doubted question of which island* in the West Indies it was whereon Columbus first landed when he first crossed the Atlantic Ocean. The subject was one which always possessed peculiar interest, especially to the historian of America, who might point with certainty to it, as a kind of landmark; and it moreover belonged to the progress of maritime discovery to set at rest the question of ages. The result of the inquiry showed beyond all doubt, not only from the agreement of the character of the island with that brief notice of it left by Columbus, but also from the subsequent track of the great Admiral to Cuba, that the island was that known as Watling Island; and the arguments advanced in favour of the other islands supposed by Washington Irving and Navarrete to have been the landfall, were shown to be perfectly untenable.

The arguments of a Mr. Gibbs, in favour of Navarrete's supposition, were simply alluded to by the Author as being so thoroughly untenable that it was not considered necessary to go into them seriatim. Their Author, however, has thought otherwise; and has sent us the following letter, which sets forth the same arguments as those which were used by him and embodied in a paper

* *The Landfall of Columbus on his First Voyage to America, with a Translation of the Baron Bonnefoux's History of his previous Life, also a Chart showing his Track from the Landfall to Cuba, and an Outline of his Subsequent Voyages,—By A. B. Becher, Captain, R.N., F.R.A.S.* London: Potter.

read before the Literary Society of New York. The whole subject being one purely historical, but involving intricacies of an entirely maritime character, such that no one who is not acquainted with nautical routine and can also follow the old seaman in his journal, written in the Spanish of the day, can have any chance in dealing with, it has been considered of sufficient importance to print Mr. Gibbs's letter and the Author's answer to it.

It was not anticipated that such a proceeding would have been reserved for the present time, but as no argument should remain unanswered on such a subject, and the more publicly the better, it has been considered by the Author that no better disposal of it can be made than consigning it to the pages of the *Nautical*, a course which he cannot but consider Mr. Gibbs himself would readily desire. With this explanation the letter following will show why Watling Island was the Landfall of Columbus.

Turks Island, 20th October, 1857.

Sir,—I have recently met with your book entitled the *Landfall of Columbus*, in which you allude to a paper read by me before the New York Historical Society in 1846, adopting Mr. Navarrete's views relative to the first discovery of America.

From a personal acquaintance with, and an inspection of the localities referred to, and by a comparison thereof with the original journal of Columbus published by Mr. Navarrete, I could arrive at no other conclusions than those which I have adopted, and which you admit are more correct than the old received opinions relative to Cat Island.

I take the liberty respectfully to point out several material particulars in the descriptions contained in Columbus's journal which may have escaped your observation, but which I conceive to be absolutely essential to be noticed in an impartial discussion of this subject.

First,—At the small island first discovered it is stated that there was a reef harbour sufficiently capacious to contain all the vessels in Christendom, which harbour we are also informed was minutely examined by Columbus himself.

This description does not apply to Watling Island, where Captain Owen says that there is no harbour, but only an insecure anchorage for small craft. This is also confirmed by Captain Barnett's chart of the island.

The above account applies perfectly to the Grand Turk Island, as you will perceive by a reference to the Admiralty chart of the Turk Islands, published in 1842, which exhibits this reef harbour. I am obligated to Admiral Beaufort, of the Hydrographic Office, for the possession of one of these charts, which he kindly presented to me while I was in London in 1842, a few days after their first publication.

Second,—Numerous islands are said to have been in sight from the island first discovered, which embarrassed Columbus in the choice of the one which he should next visit.

This description corresponds with the Grand Turk Island, from which ten of the Turk Island Group are visible at the South, besides the Caicos Islands at the West.

You will perceive by the chart of the Bahamas that this account

does not apply to Watling Island, from whence no land can be seen, except it may be the *small island* of Rum Cay, which in no way corresponds to St. Maria de Conception, the *large island* in sight which Columbus next visited.

Third,—The island first discovered was circumnavigated in one day in the boats from the South part, where the vessels were anchored (probably in the Hawk's Nest Harbour, at these islands), towards the N.N.E., and thence back again around the North end by the West side of the island.

It appears that the departure of the vessels from the island first discovered was from the southern end towards the West, after the boats had returned from their tour of inspection of the island first discovered; which from the course pursued by the boats, N.N.E. and around the North end of the island to and by the West, must have terminated at the South, whence they departed and where they had left the vessels at anchor in the large reef harbour.

On your chart you make the arrival of the vessels on the East, and their departure around the North and West sides of the island, and thence to the S.W.

Fourth,—The island next visited by Columbus was a large island, in sight, at the West, at the time of their departure, which faced the first discovered island North and South five leagues, and running East and West ten leagues.

In proceeding to this island at the West, the wind and current being contrary, the vessels could only steer S.W.

This island in no way answers to Rum Cay, the only island that could possibly be in sight from Watling Island; nor could it apply to Long Island, which is too distant to be seen, and could not be coasted for ten leagues East and West, as the second island discovered was said to have been, and to the western cape of which Columbus gave the name of St. Maria de Concepcion.

By a reference to the chart of the Bahamas you will perceive that this description corresponds with the Caicos Islands (according to Mr. Navarrete) both with regard to size, distance, and its relative position with respect to the Grand Turk Island, which is presumed to have been the island first discovered.

It might be inferred that I would naturally entertain a predilection in favour of my own native isle, but Mr. Navarrete, to whom the credit of this discovery is entirely due, and to whom the world is indebted for Mr. Washington Irving's *History of the Life and Voyages of Columbus*, and also for your own *Landfall*, could not be accused of entertaining any sinister views on this subject. He arrived at his conclusions from an entire conviction of their accuracy and after an impartial consideration and investigation of the whole subject. It has accidentally fallen to my lot to test the accuracy of his deductions.

I might adduce other reasons for differing in opinion, or rather for adopting the opinion of another, but I presume it will be unnecessary further to attempt to convince you wholly of that which you admit in

part, by allowing the prior claim of the Turk Islands over that of Cat Island, premising as I may that

> "He who is convinced against his will
> Is of the same opinion still."

Watling Island corresponds so little in those remarkable features, both nautical and physical, which have been so minutely detailed in the description of the first arrival and departure, and which would be most certain to arrest the attention of the mariner, that I feel persuaded it could not have been the island first discovered, and which has been so particularly described as possessing such unmistakeable characteristics as are recorded of the first island mentioned in Columbus's journal.

Your suggestion relative to calling the southern end of the Bahama Bank "Columbus Bank" might with propriety be adopted, as there is reason to believe, though not so clearly expressed, that Columbus anchored for a short time in this vicinity. Posterity has unjustly denied to the New World the honour of his name, but injustice and dishonour seem ever to have been the inevitable inheritance of Columbus, both during his lifetime and even after his death.

I have confined my observations to the first Landfall, which is the chief point to be considered, and shall offer as an apology for the liberty which I have now taken, the interest which I feel in the free and impartial discussion of this interesting and hitherto unsettled question.

The toil and unwearied research expended by you in the production of your work will not have been employed in vain if the discussion which it will naturally elicit should ultimately lead to the solution of so desirable a result as the identity of the certain and undoubted locality of the island first discovered, the real and undisputed Landfall.

I am, &c.,

GEORGE GIBBS.

Captain A. B. Becher, R.N.

Chief Justice Lees, of Nassau, who has bestowed some attention to this subject, admits that he has become a convert to Mr. Navarrete's opinion. I have reason to believe, though he has never stated as much, that certain queries which he submitted to me last year relative to the subject above discussed were intended for your benefit.

I enclose a small faded photograph of the fortress in which Columbus was said to have been confined by Bobadilla, at the city of St. Domingo, previously to his sending him to Spain in chains. It is still standing and about 100 feet high.

In April, 1856, I sent the original of this, with several other original drawings by my son, Mr. Geo. J. Gibbs, to the *Illustrated London News*, for insertion in that paper; but whether they considered them unsuited to their purpose, or whether they were ever received, I never heard. If you could obtain them perhaps they might

interest you, as they are all illustrative of events connected with the discovery of the New World.

I also enclose photographs of ancient monuments erected at these islands and at the city of Isabella, in St. Domingo, the first permanent settlement in the New World.

Admiralty, December, 1857.

Sir,—Your letter of the 20th of October on the subject of Columbus's Landfall should not have remained so long unanswered; and I can only hope for your consideration when I assure you that I have been prevented from replying to your observations sooner by the pressure of other matters on hand, to which I am obliged to give precedence.

I perceive that you still entertain the opinion which guided you in the paper read by you at New York, to which I have alluded in my work: but I do not find that you have added any one argument in your letter that the former does not contain. While I assure you that I do not in the least desire to influence your views of your adopted Landfall, I thank you cordially for taking the trouble to express those views to me on the subject, and to request my consideration of them; and I will endeavour as frankly to give you my reasons for believing them to be erroneous, and why I have differed from Navarrete, and arrived at the conclusion that Watling Island after all was the true Landfall of Columbus;—perfectly agreeing with you, as I do, that *opinions* are worth nothing unless they are supported by or founded on facts;—which facts in this case must be again borne out by the words of the Admiral himself. I mention this because I am sure you will be equally of the same opinion on your part, and will agree with me in the necessity there is for observing it in this discussion.

You may find, perhaps, additional reason for my sincerity in my statements, when I assure you, that for nearly five years of the time during which the subject engaged my attention, I was occupied in endeavouring to *agree* with Navarrete's conclusion of Turk Island: and it was not until I had tried to reconcile Columbus's words in any possible way with the chart, and was disappointed over and over again, that I could hold with him no longer. I was compelled to give him up when I found it impossible to follow Columbus with the courses which he (the Admiral) said he should take, and those that he said he did take, as Navarrete has laid them down. Had Señor Navarrete been a sailor, he would never have laid down the courses which he has done, and the authority for which is certainly not in the work of Columbus which he has so fortunately printed. Thus you will see that far from entertaining *prejudice* against his opinion, it certainly was my endeavour to agree with him, especially on seeing him so roughly treated by Baron Humboldt,—who had better have let the subject alone. However, having satisfied myself that I could not get on with Señor Navarrete, and seeing the fallacies in Washington Ir-

ving's conclusion, I became still more bent on getting at the truth: yet having many other things to do, I could devote but little time to the subject. Still I was determined not to let it drop, and after losing much time my first discovery of where Columbus really was in the course of his progress occurred in the midst of his journal, where he sets out on three distinct courses with his three vessels to discover Samoete, mentioned so often to him by the natives he had taken on board. From thence I traced him to Cuba, but the next point to determine was how he had reached this starting point, which I have shown to be at the S.E. end of Long Island. After much disappointment and renewed searching, I at length found the words scattered about in the journal which not only justified Watling Island as his Landfall, but also courses and distances from one island to another which enabled me to take him from thence as I have shown in the track. And this brings me to the subject of your letter. I have to say why I adopted Watling Island in preference to Turk Island,—not that I desire at all that you should agree with me in my conclusion, but I will tell you why I cannot agree with you in yours.

I perceive you speak in your letter of comparing Columbus's original statement with the chart. Of course you allude to the book which I have mentioned, No. 1, in p. 375, the *Colleccion*, &c., published by Navarrete. Have you yet found reason to be satisfied with the result which a close comparison of that statement with the chart will yield?

The first reason which I have to offer for my conclusion is, that the words of Columbus, "*muchas aguas, y una laguna en medio muy grande*," (I have quoted his words in p. 340 of my appendix,) apply better to Watling Island than they do to Turk Island, especially when accompanied by the allusion to the *verdure* which he mentions that he found in the island. I consider that those expressions of Columbus are more strictly borne out in reference to the whole island as Watling Island than they are by Turk Island; for the water is more abundant in the former than in the latter, and the verdure more general. Moreover, Watling Island is by nature the Garden of the Bahamas, and therefore more likely to be pleasing to the eye (an expression of Columbus) than Turk Island.

I should like to know which you consider to have been the first anchorage of Columbus? Surely not in the Hawk's Nest anchorage, for then he would have had no occasion to go round by the N.N.E. to have seen the Western side of the island, as he would have done that easier by going to the Westward by the Southern end. But supposing that you consider him to have been lying at anchor off the Eastern shore of the island, he would have had to go N.E. instead of N.N.E. (as he says he did) to have passed round the N.E. reef of the island; and to have passed round it from an anchorage off the middle of the island to the other side, he must have gone nine miles in his boat. Now I consider that he could have coasted Watling Island in his boats, and half that distance would have taken him to the N.W. side along the Northern shore, where he would find the harbour of which he

speaks, and which is described by Capt. R. Owen, and which I have quoted at p. 340 of my appendix. I must consider this another reason for my adopting Watling Island in preference to Turk Island.

It is this harbour I also consider to which the Admiral refers when he says the island is surrounded by a coral reef, which renders the water inside of it as still as in a well. There can be no doubt that the application of this expression is too general, although I suspect that of the two islands Watling Island would be better entitled to be considered as having that peculiar feature than Turk Island.

But we now come to the extraordinary statement of Columbus that he saw so many islands he did not know which to go to first, and I confess it seems to me altogether gratuitous and one more of imagination from those which the people had named to him, than one of sober reality. Let us, however, take the expression as it stands, and you will find that I have quoted it in p. 313 of my appendix. It runs thus:—"*Yo admiré todo aquel puerto, y despues me volví á la nao y dí la vela, y vide tantas islas que yo no subia determinarme a qual iria primero.*" Now you consider that these islands were those of the Caicos and Turk Island Group, of which he would see ten you say. Now my first remark on this is that Columbus does not say where he saw these islands from. He might have seen something from the shore as well as from the ship; but if from the former, he would hardly be tempted by the minute cays of the Turk Island Group to have gone to them,—rather perhaps to the Caicos. But taking the assertion where it appears, he sees them after returning to the ship, and the next question that presents itself is, where was the ship when he returned on board of her. My answer is, she was on the N.W. side of the island: for, if you remember, he makes use of the expression, "in order to make this inspection, I moved this morning," p. 102, the words are, "*me movi este mañana,*" which I can look on in no other light than as applying to the ship, to moving the ship, as he himself had gone in the boats, and the ship I consider to have been moved to the N.W. side of the island, and was indeed fairly under way when he returned on board. From the high stern of the *Santa Maria* I consider he might have perhaps seen Rum Cay and Watling Island at the same time, when midway between them; and he might also have seen the Caicos and Turk Island in the same manner: but the assertion of seeing so many islands at once appears to me as inapplicable to one position as to the other, or indeed to any where among the islands, unless he had them before him in a map, constructed from the description given to him by the natives. His horizon would be five or six miles distant, and the height of the land would have been in their favour, but I do think that four or five leagues would have been the furthest distance he could have seen such land, as he says they are all low. The highest part of Watling Island we know to be 140 feet, and that of Turk Island 75 feet. But taking the expression any way you will, I cannot believe the fact of Columbus actually *seeing* so many islands *at once* that he did not know which to go to first. I look on it as a mere boast of success: But undoubtedly the largest would be to the S.W. from

Watling Island, being that of Long Island; and from Turk Island that would be the Caicos. So that in fact I consider that Columbus must have been forming his opinion from the description of the natives, or possibly from Toscanelli's map, and I leave the assertion as it stands, considering it a mere boast of success. We know he was given to exaggerating his discoveries, and can readily excuse him for it.

But I have another reason to advance for my adoption of Watling Island in preference to Turk Island as the Landfall before we leave either. If you remember, Columbus says, the island is "*bien grande*" or "tolerably large." Now Watling Island is fourteen miles long and Turk Island five miles and a half. In my opinion, the former would rather be considered "*bien grande*" than the latter. And there is another expression which the Admiral makes use of after his arrival at Cuba, which is, that each island which he discovered was larger than that which had preceded it. I forget the reference to this remark, but hope to add it in a note,—for I attribute much importance to it, and consider it as corroborative of Watling Island being the Landfall rather than Turk Island.

As I perceive you seem to think, in your third reference, that the ships really lay in the Hawk's Nest anchorage, you have yet to say why Columbus chose to go round the N.E. point of the island, a distance of at least eleven miles, when half that distance would have taken him to the middle of the West side, by going round the S.W. extreme of it, only to see what there was on the West side, which he had not seen, and which only was his object. Surely he would have taken the shortest route to do so.

Where does it appear in the words of Columbus that when he left Guanahani, it was from the "Southern end" of it as you state. He had left the ships, but, as I have already observed, there is reason for believing that he had left directions for them to move, by using the words "*me movi este mañana*," and I can find no allusion to the *South* end of the island by him.

As we have now done with Guanahani, and I have given you my reasons for believing this to have been Watling Island rather than Turk Island, we will now go with the Admiral to the next Islands.

The first thing that strikes me is, that you have taken him in a W.N.W. direction (true) to the Caicos, a course for which I believe there is no authority in the journal. Now as I consider that the variation in those parts, when Columbus discovered them, was about a point and a half Westerly, this would be nearly N.W. by compass, and I do not find that the journal supplies any authority for this course. But the Admiral distinctly says, that as the Indians had told him that there was land to the South and S.W., (p. 94–5,) it was his intention to go in this direction; and he adds afterwards, that he *is going* to the largest island he can see. Now Rum Cay lies in a S.W. direction from Watling Island, and although we are here met with the old assertion of his going to the largest island he *could see*, there is more probability of his seeing Rum Cay than Cat Island from the neighbourhood of Watling Island.

You consider the next island to have been one of the Caicos; but I think you here overlook an important statement or two. In the first place, the current I think would favour Columbus getting to the Caicos from Turk Island, whereas he observes it was against him, and with the calm prevented him from reaching the island until noon; and it was when off this island that he said he saw another to the Westward, for which he crowds all sail on his ship and succeeds in anchoring off the point of it by daylight—*i.e.*, before sunset,—a business which he was most particular about, as being anxious not to drop his anchor on foul ground. You will find all this in his own words of Monday the 15th of October, in p. 314 of my appendix. And here again allowance must be made for Columbus making no allusion to this island further than that he ran along the North side of it, and the erroneous views he entertains of its size,—the side next to S. Salvador being five leagues long. At the same time, considering how much he had been detained by the current in his S W. course, which current is well known to set to the Northward between Rum Cay and Watling Island, and that he was most probably never on the East side of Rum Cay, at all, I say, considering this, due allowance must be made for this estimated size or length of the island next to Guanahani, his Landfall: But in those distances which he ran over in the vessel, he was tolerably accurate; thus between Rum Cay and Cape Santa Maria,—and also between this Cape and Fernandina.

But I am getting away from your ground, and you will observe that I entirely dissent from your views when you consider that Columbus *visited* the island he next went to from S. Salvador, and believe that you will find that proceeding is contrary to what is stated in the journal, which says he *passed along the North side* of it, and therefore did not visit it. I have satisfied myself that he considered it too small and unworthy of his attention, as Rum Cay must have appeared when so large an island as Long Island came into view; more especially as the landing on it is difficult and only to be effected on its southern side.

You observe that all this will correspond with Caicos.—How can that be when he would be running along the land of these islands close to them for a distance of 70 or 80 miles? This surely would be stated in the journal if he had done so; besides, the course is first North, then W.N.W., then N.W., then S.W., and where is his Cape Santa Maria. These courses are no where in the journal, but to Cape Santa Maria he runs West as he stated it to bear from him, but not the distance, and he gained his object by arriving there by sunset.

Have you tested the accuracy of Navarrete's "deductions?" If so, will you be so good as to say whereabouts in the journal of Columbus (which he has so happily printed) are to be found the courses and distances which he lays down? I really could not find them any where, but I did find sufficient and good authority in the journal for those which I laid down from his Landfall.

Your allusion to any one "convinced against his will" I am quite ready to admit the truth of, but I must have argument to set aside the

authority which I have advanced as that of Columbus himself for the opinions which I entertain. I have told you why I have preferred the Landfall as being Watling Island rather than Turk Island,—Will you show why you consider me wrong? and if your reasoning is better than mine I will give up my opinion; but until I can see that it is so—which as yet is not the case—I cannot do so.

You observe that "Watling Island corresponds so little in those remarkable features both nautical and physical," and that you "feel persuaded it could not have been the island first discovered." Now I think that those features do correspond much more with what Columbus says in respect of Watling Island than they do in Turk Island; and I think also that the subsequent courses and distances from one island to another amply corroborate that view of the subject. How for instance would you bring Columbus to an anchor on the bank which you seem to agree might receive his name, but by the courses which I have laid down. How does your coincidence in this opinion with me agree with the courses which Señor Navarrete has made Columbus take round Inagua. The journal is so totally departed from here, that there is reason for doubting whether Navarrete has not left them as a speculation of opinion rather than fact, or whether he ever laid down a traverse in his life,—a process certainly which the titles he quotes to his name would not lead one to infer that he could perform. But if Señor Navarrete erred in this, he has more than amply compensated for it by having printed all the papers of Columbus; and much as I may differ from yourself and others, I shall always consider myself under great obligation to Navarrete for having done so,—since, as I have said, it enabled me to come to the conclusion which I have adopted, however prejudiced I may be in its favour.

My letter in reply to yours has run to an immoderate length. But you drew it on yourself, for to reply seriatim to the different views so easily and briefly expressed by you, it was necessary to consider them in detail; and I fear that many points are yet left unconsidered. One of them consists of the monuments, the photographs of which you have been so good as to send me, and for which I am much obliged. But I cannot consider these monuments as having been left by Columbus, for there is not a syllable of allusion to them in the journal; and they might have been left at some subsequent period. In fact, they are monuments the produce of men's hands; but, whose, there is nothing to prove. And Columbus is so particular in stating trifles, that had they been erected by him he would not have omitted to mention their construction.

I perceive that you mention Chief Justice Lee of Nassau as being a convert to the opinion of Navarrete. Such an authority as that gentleman cannot but have good reasons for his conclusions; but as I am not aware what those reasons are, I cannot compare them with my own. These, however, I have now stated, in addition to what is printed in my book, and any objections which he may have to them, would immediately receive my attention. For believe me sincere when I assure you that my aim has been the truth;—satisfied that this the-

ory, or that, cannot stand the test of inquiry and comparison which time inevitably brings about, unless it be founded on that rock of ages—the truth. Señor Navarrete somewhere makes the observation that Columbus was "difficult to follow,—always plausible but most unsatisfactory when apparently he was most certain of his position." The track which Navarrete has laid down (r rather which S ñor Muñoz has laid down for him) as that of the Admiral, is a good illustration of the truth of this in showing the real difficulty which Navarrete must have encountered when compared with that which has been laid down by me from the words of the Admiral. Columbus might indeed here and there have been more explicit in his descriptions, but those few nautical remarks which he has given concerning his movements, were sufficient to enable me to follow him when I had once the clue to his whereabouts. But Navarrete had a bad chart as well as Washington Irving, and in an investigation of this kind it is evident that a good representation of nature is one of the first essentials to a clear understanding of the subject, for it enables one to make allowaces for deficiences in description, and this is necessary in some degree with the subject before us.

This however, I fear, you will consider little to your purpose, who are for upholding the Landfall of Turk Island. But before you can fully substantiate that, you will not only have to show how the island itself answers to the description of Columbus, but also the manner in which he left it,—in fact his subsequent proceedings,—the courses and distances which he gives from one island to another, as corroborative testimony to the first;—for without this, the mere fabric of a theory must crumble away before any other that may be set up in opposition to it; and this I consider to form a leading argument in substantiating the truth of Watling Island being the real Landfall as shown by me.

I fear that this letter has already extended far beyond its expected limits, and I could wish that I were better able than I am to go thoroughly into the subject, for I have no doubt omitted many points that would be both interesting and useful in the discussion. I must not leave it however, imperfectly as I may have explained myself, without thanking you cordially for having addressed to me your objections to my conclusions, and for explicitly stating the grounds on which you uphold your adopted Landfall. If I have not answered all those objections, or if you wish me to be clearer on any of them, I will immediately return to the subject with any other reasonng that may occur to me, as I trust that I have impressed you with my sincerity in desiring to establish the real Landfall by the words of Columbus himself, corroborated only by the chart, disregarding all speculative opinion from any source whatever, and judging only from those materials which can be only considered as the real authority by which we must be guided in determining which was really the Landfall by the words of the Admiral himself.

I am, Sir, your obliged,

A. B. Becher, *Captain, R.N.*

Author of the Landfall of Columbus.

A Lighthouse Tour of Lake Superior.—*By Captain Mackinnon, R.N.*

(Concluded from page 86).

The wind being fair and the distance short, we ran it too soon, and in consequence were obliged to lay by for several hours and to endure the unpleasant rolling of the vessel, which with the creaking of doors kept us awake until daylight. We then ran through the intricate passage between sandbanks into the harbour of the celebrated city of Superior.

It cannot be denied this embryo city is one of the finest geographical points in the interior of America. At the further extreme of the great internal water communication of the country, it must hereafter become such a thoroughfare by rail and water that the world has never seen in the interior of a great continent. With a healthy and bracing climate, fertile soil, and inexhaustible mineral riches, it will outvie all other inland cities in America. Added to this it will have—with certain unimportant improvements—a spacious and perfect basin for a harbour. Three rivers discharge their waters into this harbour: each of which is capable of being improved sufficiently to enable vessels to ascend them to considerable distances. Minnesota and Wisconsin each extend a natural arm-like pier, or barrier of sand, to inclose this commodious haven. To these prodigious natural advantages we may add a powerful combination, composed of leading politicians and capitalists, who are bonded together to expedite and insure its rapid progress!

And what is the end of this irresistible combination of advantages? Let us explain the probable result.

A powerful company being formed, they first introduce the unusual custom of laying off the proposed town site (3,500 acres) into lots 25 feet frontage and 120 deep. This, let it be observed, nearly one-third the usual size. In addition, 1,500 acres are laid out in blocks of undivided lots; making a total of 5,000 acres introduced into the market under the auspices of this company. This in truth is sufficient to surfeit the most extravagant town-makers, even in this wonderful town-growing country, and would perhaps be justified in a few years by the gradual growth of the place.

Other speculators, however, thought it as well to hang a peg upon the mighty prestige of such wealth, talent, and sagacity, and accordingly determined to have a finger in the pie. In they flocked in shoals and began to preempt land,—not, be it noted, to settle and improve, but merely to speculate and sell at a great advance. This fever continued to such an extent that the city grew—on paper—to cover the whole mainland bordering on the harbour to the extent of nearly if not quite seven miles, besides the barren sandy spit forming the harbour itself.

It will hardly be credited that this city of Superior is at this moment covering nearly if not quite an area of 15,000 acres!

On the faith of the names directing the original company, who are firmly believed to have been actuated by a fair commercial spirit, this enormous tract of land, divided into literally countless lots, was advertised to the public of America and England as a splendid speculation, and it may be broadly asserted that so gigantic a bubble was never before presented to the world.

Preemptions have likewise been made on every foot of ground for miles along the North coast—the coast of Minnesota—by a lower class of speculators; who clear perhaps an acre, or less, to secure the right, and then quietly await a real settling purchaser.

In this vast extent of ground there is not 100 acres of land in cultivation. The inhabitants obtain all the common necessaries of life from the East by steamboats, even to cabbages and onions. There is not an atom of trade of any kind in this "bogus city" of 2,000 inhabitants, but the vicious activity excited by an idle population squandering the temporary profits of inflated speculation in real estate. Every man who has bought land since the foundation of the city, some three years ago, fancies himself rich because his lots are nominally three, or more, times the price he paid. Let any one try to realise and see the immediate downfall of this baseless fabric. A generation thirty years hence, when the majority of us will have passed away, the value of these 15,000 acres will not equal that now demanded.

The lots situated on Second Street, the supposed choice location, at present are valued and sold for 1,000 dollars (£200). Take these lots, 25 feet frontage and 120 deep, at this price. Nine such lots, allowing space for streets, will cover an acre, making the enormous sum of 9,000 dollars (£1,800) per acre,—these said acres, be it understood, that three years ago cost the company 1¼ dollar (5s.).

The price of all the necessaries of life is proportioned to this vicious and anomalous state of excitement. Labour at Californian prices; and expended not in useful and productive work, but in improving imaginary roads and avenues, visionary (at present) railway depots, and other improvements that it will take years to bring into utility and profit.

The greatest trade carried on is that of selling land, and there can be no doubt that numerous victims from all the States of America, besides England and Europe, have invested large sums of money in swelling this vast delusion. It is with this money that the fortunate sellers are luxuriating in trotting horses, yachts, and champagne. But there is not a single person engaged in the real business of advancing the true interests of a city! A frightful collapse must take place, and all who are not prepared by getting out must be content to see their property valueless for the present.

Hereafter, at an indefinite period, no doubt it will take a new start, when the present speculative race are swept away. But it is impossible for any city to grow in a steady and healthy manner under the fever heat of extravagant and reckless speculation. Man proposes

and *le bon Dieu* disposes, and the very pains and skill taken by this powerful combination have been defeated by the overwhelming weight of its own power. It has attracted the attention of all the wild speculators in America; whose unwelcome assistance has for a time destroyed one of the best considered and well arranged plans of the present day! The great national cry, "Go ahead," has here been carried to excess, and, as sometimes happens in these United States, "Go ahead" tumbles head over heels. Brother Jonathan is not the man to be put out by this little error. He will pick himself up, shake his feathers, laugh at his own exploits, and then be ready to go ahead with a little more caution. Success to you, Brother Jonathan! Your go ahead qualities deserve admiration when kept within proper bounds.

Having completed the necessary business connected with the new lighthouse building on Minnesota point, at the entrance of the harbour, the good ship *Michigan* commenced her return along the North coast of Lake Superior to the Sault St. Marie. A run of fifty-six miles brought us to the first harbour on the N.W. coast, where another incipient town (Beaver Harbour) is struggling into existence.

It is situated on the N.W. shore, fifty-six miles from Superior, at the entrance of Arnica or Beaver River. The plot of town is laid out round the bay, quite open to the S.E., with the exception of a small island, which map makers are pleased to call "a natural breakwater fifteen feet high," protecting about one-fifth of the bay.

The aspirations of the proprietors are modest, compared to the usual expectations of this town-making district. It is divided into 144 shares, of about 12 or 14 lots, each lot being 60 feet by 150. The shares are valued at 300 dollars (£60). Considering that the population consists of fifty persons, it has, for a Lake Superior town, a considerable quantity of land cleared and cultivated—namely, forty acres; thus contrasting favourably with several other of these new cities.

Whilst the officers were settling the site of a new lighthouse, to be immediately erected, we strolled along the beach in search of agates, which abounded. The beach was covered with small and inferior specimens; but ample evidence existed of a considerable supply, especially after a storm. Boulders containing copper also are frequently met with. Some distance in the woods we fell in with a stake on which was marked "Jefferson Avenue." We were extremely tickled by this little incident, as it so thoroughly exemplified the state of these incipient cities.

Forty miles coasting brought us to the snug little harbour of Hiawatha, the original spot from whence the legend of the celebrated chief of that name is taken. The harbour is the best on the North coast of this lake that we have seen. It is of curious formation,—a semicircle, which would be quite open to the S.W. were it not for two natural piers of trap rock that jut out from either end of the bay—thus forming an excellent little dock on each side.

As this harbour is decidedly the best for a considerable distance of

coast on each side, it may be predicted that a settlement will soon be made here. The Government think it a good point for a lighthouse, and the site was decided on and fixed during our stay, on the eastern end of a natural pier. It is asserted that there is a good farming country in the rear, and a chain of small lakes and portages which can easily be connected with this harbour. As it is probable that the Canadian Government will ere long build a railroad through that territory, it must infallibly pass in the rear of Hiawatha. It is fair to infer, therefore, that this place has a better chance of success than most of the projected towns on the North coast.

The parties to whom this place belongs it appears are not actuated by the fever of speculation so common on this lake. They intend to introduce an agricultural population as a foundation on which to erect their city. Their town plot does not exceed 320 acres. This is a fine timber country, backed by a plentiful water-power. Large quantites of white-fish, fiskowit, and trout are taken. There are evident indications of mineral wealth. Altogether it is refreshing for once to see a projected city that has some chance of success!

After carefully pointing out the position of Hiawatha lighthouse we proceeded towards Isle Royale. As we ran along the coast we perceived by the never failing indication of deserted clearings and dilapidated houses, the site of abandoned mines.

At 10h. a.m. on the 19th we entered Rock Harbour, a natural inlet of great capacity, and forming an extensive and landlocked harbour. Finding the water too deep to anchor without inconvenience, we hauled alongside the rocky margin. The clearness of the water on this (the North) side of Lake Superior is beyond belief. At ten fathoms (sixty feet) the anchor and chain were distinctly seen from the deck.

The lighthouse-keeper was a blunt specimen of a Britisher from Preston, in Lancashire. He had an exceedingly intelligent half-breed wife, with four of the most beautiful children ever seen. He told us that his family were the sole residents of Isle Royale since the mine "bust up." "I guess," he exclaimed to the inspector, Captain Scott, "Uncle Sam does not treat me well. I am obliged to steal my wood. There is none on the island." This created some merriment, and he was asked if he ever went to the North shore—the mainland. "Sometimes," he replied, "but yon is hard work on the ice,—it is fifty miles. I guess, Captain, I shan't stop here. I want to get to a more civilized place." Altogether he was a curious specimen of a Lancashire and Yankee cross, streaked with lighthouse misanthropy!

The buoyancy of the water of Lake Superior is no less remarkable than its clearness. We were in the habit of jumping overboard every morning for a swim. The first time we indulged in this "very cold" bath we were astonished at the apparent buoyancy of the water floating us higher above the surface than in the sea, and infinitely higher than the river Thames. We were informed by one of the veteran voyagers of the Hudson Bay Company that this buoyancy of Lake Superior water has long been noticed. So much so, that canoes can

carry a heavier cargo after passing a certain point in the Sault St. Marie River. In other words, a canoe draws less water as she ascends the river.

As regards the clearness of the water, it is difficult to describe it. Leaning over the bows of the *Michigan*, as she was running towards the end of Lake Superior, into the Sault River, we were watching the bottom, which, outside the ripple made by the bows, was as clear as glass. How is it possible in words to express the wondrous purity and clearness of this almost liquid glass that we were in? Every pebble was distinct! Steadily onward went the sharp stem, cleaving the transparent medium, whilst we were lost in admiration of it, when suddenly a strange object was presented to our bewildered gaze and broke the spell of enchantment which had so long fixed our astonishment.—We were gliding over the bows of a sunken steamer! She seemed to pass swiftly but distinctly beneath us, and vanished under our feet. "Is this a dream?" we exclaimed, rubbing our dazzled eyes, and distrusting our senses. We were speedily recalled to reality by the harsh voice of Captain Reed, in the wheel-house over our heads, hastily calling out "I guess that's the wreck of the *Independence*, blown up and sunk in 1854!" And so it was!

Half an hour after this little incident we were again in the canal, and, speedily passing through the locks, bade adieu to magnificent Superior for ever!

Scarcely was the *Michigan* moored to her wharf when the alarm was given that the canal banks were giving way. Hastening along the banks to examine the damage, we soon discovered a hole two feet in diameter, one-third of which was below the water line. On peering into this we perceived a deep hollow, into which the water poured with violence. On the river side of the bank a dismal, muddy stream issued, bearing the contents of the embankment. On the surface of it were large cracks, momentarily widening. Suddenly, however, the shrill whistle of the *Michigan's* steam-pipe called us away, and a few moments more we were moving rapidly down the river, and soon the beautiful rapids of the Sault St. Marie vanished from our lingering gaze.

As we are now about to finish our cruize, having inspected all the harbours and lighthouses on the American coast of Lake Superior, let us take a glance at the coast belonging to Canada.

It is believed that this coast abounds in all the treasures—animal, mineral, and piscatory—of the American coast; and that there are more natural harbours, and more facilities for progress and commerce there than on the American coast. If this be so, and we fully believe it, what is the reason that there is not a single lighthouse on the British side? Why should the provincial trade be indebted to Uncle Sam for lighting Lake Superior? A patriotic Britisher wishes to see this amended, and we respectfully call the attention of the authorities to this national disgrace. To bring the case clearly before their minds we subjoin a list of the Lake Superior lighthouses kept up by the American Government.

Lighthouses Visited and Inspected by Captain Scott, U.S.N., and Captain Smith, Topographical Engineers, accompanied with lampists, artificers, and attendants.

No.	*Name.*	*Position.*
496.	Round Island	Near entrance to River St. Marie.
497.	Point Iroquois ...	On South shore of Lake Superior.
498.	White Fish Point .	On White Fish Point, Michigan.
499.	Grand Island	North point of Grand Island.
500.	Marquette	On North point of Marquette Harbour.
501.	Portage River	Near mouth of Portage River, southern shore of Kemenau Bay.
502.	Manitou	On Manitou Island.
503.	Copper Harbour ..	On Copper Harbour, Michigan.
504.	Rock Harbour ...	N.E. end of Isle Royal.
505.	Eagle Harbour ...	At Eagle Harbour, Michigan.
506.	Eagle River.....	South shore of Lake Superior.
507.	Ontonogan	At mouth of Ontonogan River, Michigan.
508.	La Pointe	On the island near La Pointe.
509.	Minnesota Point ..	At the head of Lake Superior; mouth of the St. Lewis River.
	Beaver Harbour ..	Selected site for.
	Hiawatha Harbour.	Ditto.

In conclusion we beg to state that all we have said about the copper mines and speculative cities is done so conscientiously; and although we may create a very bitter and hostile spirit in numerous speculating circles, whose plans are here analysed, yet we feel sure that these remarks will meet the approbation of the great majority of the public, both in England and the United States.

Suggestions for Avoiding Collisions at Sea,—*By S. M. Saxby.*

In all things connected with shipping, and especially with their evolutions, simplicity is highly desirable.

Collision at sea is generally the result of a sudden act on the part of a master, or pilot, or commanding-officer of the deck. Such hasty decision often proceeds directly from a mere glance at the relative positions of the approaching ships; consequently, the remedy seems to lie in the enabling of commanders and others to gather from such "glance" *absolutely correct* notions for their guidance at the moment.

Experience convinces that no positive "rule of the road" can properly be laid down for the avoidance of collisions; a certain discretionary power in each commander seems to be necessary for the guidance of each vessel;—"positive rules" for the management of the helm may even be dangerous.

Collisions are not confined to the hours of darkness, since they

occur in broad daylight, especially on rivers;—hence they are not the consequence of a defective system of lights alone.

Collisions in general may be attributed to neglect of the following consideration, viz.,—If a commander sees a vessel approaching, either stem-on or obliquely, he can with certainty avoid her if he discovers what his opponent is doing or is about to do with his helm!

Legislation, therefore, seems to be needed in order to give to commanders, *at the proper moment*, this important information. Therefore I propose as follows, viz.:—

By Day.—Whenever a commander or pilot gives an order to his helmsman to "starboard" the helm, let him immediately place himself where he (or some one forward whose duty it may be) can be seen by the other ship, and at once extend his right arm horizontally —always supposing his face is towards his own ship's head; and if he orders "port," let him in like manner extend his left arm. ***When either of the commanders does this, collision is scarcely possible!***

Priority of signal would then be the *only* point for discussion, in case of damage through obstinacy. Vessels that are manifestly smaller should be expected to attend and conform, when practicable, to signal from the larger ship, and especially where draft of water might render it desirable. Unnecessary obstinacy at such times would be criminal.

Surely, by day, no other "rules" can be necessary, except the old established ones of "Starboard tack hold on," "Sailing vessel hold on," "Steamer give way," &c.

By Night.—A danger light is absolutely indispensable. At present we have none. ***Let, therefore, a white light be always a danger light.***

It should be carried at the bowsprit end of all square-rigged vessels, circumstances permitting, and within certain limits of the land.

It should be compulsory in all sailing vessels to have this light in a lantern of three colours, as it is often used at present, the three bull's-eyes being lighted from the same wick; care being taken to have a stick (say two feet long) attached to the after part of the lantern, by means of which (as a guide rod) the more correctly to lash the lantern in a fore and aft line with the bowsprit. The centre or white light (the red and green lights indicating "port" and "starboard" as at present) to be so hidden by projecting screens, which might be attached to the lantern, that another ship being more than two points on either bow would not see the danger light, but would see either the red or green light, which would at once indicate her course and direction.

When vessels are approaching and any order is given in either of them as to moving the helm, an *additional* light (coloured or white, according to circumstances) should be exhibited where best seen, as under, viz:—

To indicate that the helm either is, or is about to be, put "a starboard," show a hand *green* light.

To indicate that the helm either is, or is about to be, put "a port," show a hand *red* light.

To indicate no intended change of helm, show a hand *white* light.

A hand lantern of three colours should always be ready after sunset.

Ships wanting a pilot might in moderate weather attach an all-round white light with a lanyard three feet below the signal lantern at the bowsprit end; in bad weather an occasional blue light at intervals, with an additional light on the forecastle, would be enough to attract a pilot's attention.

Perhaps, then, no distinguishing light in a pilot vessel would be necessary, because pilots on the look-out would run down to and speak such ships, and in approaching might show an additional light in answer.

To distinguish steamers from sailing vessels, the lights (viz., white at the mast and red and green amidships) at present used in steamers are sufficient, except that the white or *danger* light should only be visible two points on either bow, and then it would always be a *warning* light. The use of the hand light to be the same as for sailing vessels.

Should a steamer be in danger of overrunning a sailing vessel, a white danger light shown over the taffrail, as at present, would be sufficient.

If the above, with probably some additional arrangements, are carried out when ships meet at sea, it must conduce to greater safety; for even if no look-out be kept on board one of the two ships, the other could take steps for avoiding her!

H.M.S. "Shannon" Struck by Lightning.

On the 25th May, while on her passage to China, this ship encountered one of those terrible storms of thunder and lightning so frequently occurring to ships in the Indian Seas that happen to be within their range. Her log shows that when to the southward of Java Head she was assailed by a furious storm of thunder and lightning, accompanied by heavy rain. The following is an extract from her Master's log, lodged at the Admiralty:—

Extract from the Log of H.M.S. "Shannon."

"Monday, 25th May, 1857.—p.m.—4.48.—Up courses, down steering sails. 4.50.—Violent storm with vivid lightning, hail, and rain, driving before it remarkably high seas which threatened to poop the ship. 5h.—Struck by lightning at main topgallant mast-head; apparently by a ball of fire, which seemed to run up the royal pole and break into fragments with a loud concussion; pieces of fire falling overboard being driven by the wind to leeward. 5.15.—Ship struck a second time by lightning at main topgallant mast-head; lowered foretopsail to a violent gust. 5.30.—Ship struck a third time by

lightning with two distinct blows. 5h. to 6h.—Zig zag lightning with loud thunder all around. 8.10.—Sheeted home main topsail. 9.30.—Set foresail; a confused sea, with heavy rollers from W.N.W.

"26th, Tuesday, a.m.—7.50.—Altered course to E.b.S. Examined masts and rigging very carefully, but found no injury to either."

It is important to observe that the *Shannon* was fitted with the permanently fixed lightning conductors, now generally fitted to ships of the Royal Navy, so long advocated in the pages of this journal, and by which, as we firmly believe, many ships and valuable lives of our seamen have been saved from partial if not from total destruction. Looking back to dates of these instances some half century since, we find an account of damage by lightning to the *Lowestoffe* frigate, and of a severe thunderstotm, which by a singnlar coincidence is described in the ship's log in a way very similar to that we have just quoted, thereby furnishing a most instructive and remarkable contrast to the case now before us.

Remarks on board H.M.S. "Lowestoffe," Tuesday, 8th March, 1796. Minorca, dist. 134 miles.

"p.m.—Heavy squalls, thunder and lightning, with hail and rain. 12.25.—A flash of lightning knocked three men off the mast-head,—one of whom, John Goolan, was killed. 12.30—Another flash shivered main topmast in pieces. A few minutes after, a following flash set the ship on fire in various parts of the masts and rigging, shivered the main mast in pieces, also fore topmast, and carried away fore topsail yard; knocked many men out of the tops, one of whom, James Campbell, was killed. The lightning, entering between decks, made such an explosion as to affect all, rendering some totally benumbed in different parts of their bodies. 1.30.—Cut away the main mast; employed clearing wreck. 2.30.—Weather began to clear, set foresail, &c."

If we for a moment contrast these two logs, the one in March, 1796, the other in May, 1857, it is not difficult to perceive of what enormous advantage to the public service is the permanently fixed lightning conductors so long advocated in this journal. We may well say in the words of the immortal bard, "Look upon this picture and upon this." The concluding words of the *Shannon's* log are most satisfactory.

The lightning conductors had evidently done their duty and preserved to the nation the effective services of this fine frigate, which, considering that the ship was on her way to China and India, were necessarily of vast importance. Had the *Shannon* been dismasted and otherwise disabled, some of her crew killed, perhaps, as occurred under similar circumstances to the *Lowestoffe*, above quoted, the brilliant achievements of Capt. Peel in India might have never graced the naval records of his country.

The Indian Ocean considered with Reference to the Wants of Seamen.

(Continued from p. 71.)

The China Sea and Eastern Passages to it.

The straits by which the Indian Ocean is left for the China Sea, are those of Malacca, Sunda, and the Eastern straits of Bally, Lombock, Allass, Sapy, Flores, Aloo, Panthar, and Ombay. The several routes from the Cape of Good Hope to these straits have been already alluded to as those of Nos. 1 to 8 in a former page. The first six lead to the strait of Malacca; No. 7 is the route for the strait of Sunda, and No. 8 is that to be taken when bound to either of the Eastern Passages.

A ship having reached the strait of Sunda, or either of the Eastern Passages, and proceeding to steer North, must pass West or East of the large island of Borneo. The route then to be taken for China, will depend on the prevailing monsoon in the China Sea. Yet in general, when a vessel is certain of gaining her port with the S.W. monsoon, she should take the strait of Sunda, and keeping West of Borneo, and through the straits of Carimata, Gaspar, or Banca, between the West coast of this island and Sumatra, Billiton, and Banca. This is the most direct route for reaching China during the S.W. monsoon. But when, on the contrary, the N.E. monsoon prevails in the China Sea, it is necessary, if a ship would not have to encounter a contrary monsoon, (although she may do so, but it is trying work for her, and also very tedious,) to take one of the passages East of Borneo, the strait of Macassar, into the Celebes Sea, from thence, according to circumstances, proceeding Northward, and passing East or West of the Philippines. In this monsoon Pitt Passage, to the Eastward of Celebes, may also be taken, crossing the Moluccas and entering the Pacific Ocean by Pitt Strait, Dampier Passage, or that of Gilolo, then keeping to the Eastward of the Philippines, to enter the China Sea by the channel South of Formosa.

Thus it may be taken as a general rule, that with the favourable S.W. monsoon in the China Sea, a ship should go West of Borneo; and with the contrary N.E. monsoon, she should go East of that island.

Lastly, there are two other routes that may yet be taken for China; these are, the great Eastern Passages, one by Bass Strait, and the other South of Van Diemen Land. These two routes are the safest, when the Cape is passed, towards the month of September, the latitude being run down in the Pacific Ocean, and the China Sea entered by the channels South of Formosa.

Route from Cape of Good Hope to China, with S.W. monsoon,—Direct Route.—To make the direct passage to China, a vessel should have reached the meridian of Amsterdam by the 1st of July at the latest, so as to arrive in China in August. This route, No. 7, as far as the strait of Sunda is already pointed out.

In passing the strait of Sunda, either channel may be taken for the China Sea, passing to it by the strait of Banca or Gaspar, and afterwards crossing the equator in 105° 30′ or 105° 40′ E.

Inner Passage.—The China Sea being entered by the strait of Singapore or Banca, the passage West of the Paracels, called the Inner Passage, will be found the shortest and most direct route during March, April, and May; but in June, when the S.W. monsoon is fully established, the route by the Macclesfield Bank, called the Outer Passage, will be preferable. Some further details may be acceptable concerning this latter route, which should be taken when the S.W. monsoon is well established.

Route from Pulo-Aor to Macao, during the S.W. Monsoon.—Thus a vessel after passing East of Pulo-Aor should make for Pulo-Sapata, being careful to allow for the Easterly current from the gulf of Siam, that may be expected in the run between these two islands to set her several leagues to the Eastward of her reckoning. She should also, on leaving Pulo-Aor, run a convenient distance to the Northward, to avoid Charlotte Bank, and not make Easting until the latitude of this bank (about 7° 6′)is passed: she should then steer so as to sight Pulo-Sapata.

In case of having no observations, when approaching Pulo-Condore and that island, great attention must be paid to the lead, as well as when nearing the Catwicks.

After having passed about seven leagues East of Pulo-Sapata, a course should then be steered to strike soundings on the Eastern part of the Macclesfield Bank, allowance being made for Easterly currents, which generally prevail during the S.W. monsoon. These being found, a course should be shaped for the largest of the Ladrone, which should be passed on the N.E., when the wind is fresh from South or S.W. But at all times it will be better to avoid making the Western coast.

A vessel leaving Pulo-Sapata towards the middle of September, as soon as she has reached the parallel of 12° or 13°, clear of the banks in the Southern part of the China Sea, should keep well to the Eastward, as indeed on getting to the Northward it is possible she may meet with N.E. or E.N.E. winds; in which case she is again on a bowline, and must make her Easting as well as she can.

In the month of October she should make the coast of Luconia, and not steer for the coast of China until she is well North of Cape Bolinao, taking care also to keep a good look out when near the parallel of the Pratas.

A vessel about Pulo-Aor, later than the month of September, will find great difficulty in making direct for Canton, on account of the strong Southerly currents and the prevailing light winds from the Northward. In this case experience has shown that the best route is to the Eastward, making the West coast of Luconia.

The passage to the Northward may be made at any time of the year along the West coast of Mindoro and Luconia, provided the vessel is a good sailer. It may be as well to keep along the coast, so as to take

advantage of the alternate breezes and variable Westerly winds which are met with from October to April.

Palawan Route.—A vessel having reached Pulo-Aor or Pulo-Timoan about the month of October, would adopt the following, called the Palawan Route.

From Pulo-Aor she would steer for the South Anambas, and leave these islands to the North, as well as Laut and the Great Natuna; from whence she would pass between the Louisa and Royal Charlotte Banks. She would then make for the island of Balambangan, on sighting which she would pass it at a distance of eight or nine leagues, with a southerly wind. But with the wind Westerly, she would keep it fifteen leagues from her, and make for the island of Balabac, which she would pass at a distance of nine or ten leagues with favourable winds. With Easterly winds she would near these two islands, on account of the strong Westerly currents, and then enter the channel formed by the Half Moon, the Royal Captain, and Bombay Banks, and the outlying dangers of the Northern coast of Palawan. In passing through this channel she would keep generally about thirty miles from the shore, using the greatest caution, in order to avoid all those dangers.

With an Easterly wind, when the vessel is to the Northward, she would sight the North cape of Palawan, and the Calamianes Islands, and then make Luban or Cabras Island, keeping near the coast of Luconia. She will thus reach Cape Bolinao, from which she would keep at a convenient distance, on account of the outlying shoals, and the currents, which sometimes set into the large bay near it.

A ship having reached Cape Bolenao, will be pretty sure of passing East of the Pratas, unless prevented by a N.E. gale and strong Westerly currents, which is frequently the case. It would therefore be prudent to keep along the coast of Luconia as far as Cape Bojador, in order to make sure of sighting the coast of China East of the Lema Isles, from whence Macao would be easily made. Should the season be too far advanced when leaving Balabac Strait for China by the Palawan Route, the Sooloo Islands and sea of Celebes should be crossed, and then double the Northern point of this island into the Pacific Ocean, passing South of Mindanao, a route which we shall shortly describe, forming one of the Eastern routes.

A vessel going to the Moluccas, on leaving the strait of Malacca may take the same route; if before September she should make to the Eastward after she has entered the Pacific Ocean, and then run down to the Moluccas, either by the Gillolo Channel or Dampier Strait; in September, after she has doubled the North point of Celebes, she may proceed to the Moluccas by the channel of this name.

Eastern route for China during the N.E. Monsoon.—The Eastern route for China is taken by vessels from the Cape of Good Hope that reach the meridian of Amsterdam Island between the 15th of September and the beginning of December, and is the route No. 8 of the chart, leading to the Eastern passages.

A ship going from any port of India to China by the Eastern route,

should, if possible, leave in October or November, in order to return by the usual route before the end of the monsoon.

In leaving a port in the Northern part of the gulf of Bengal for China, when the time of the season obliges her to take the Eastern route, she would take the strait of Malacca and the Carimata Passage, or go West of Sumatra if circumstances allow. A ship leaving the same ports at the beginning of the N.E. monsoon, the strait of Malacca and the Palawan Route will be better for her than the long circuit she would be obliged to make in taking the Eastern route. When leaving the coast of Malabar, or Ceylon, or any port situated South of the Coromandel coast, Pondicherry for instance, she would pass South of Java, and take one of the straits East of this island. The strait of Sunda might also be adopted, and then she might make her Easting in the Java Sea and towards the strait of Macassar. On leaving the Malabar coast or any port on the West coast of the Indian Ocean, she would not enter the strait of Malacca.

October and November are considered the two most favourable months for running through the strait of Macassar; this is the first of the Eastern routes. In other months it appears to be more advantageous to take Pitt Passage, especially from the middle of December to February.

Vessels having reached the Eastern straits in the latter part of January or February, generally take Lombock Strait; in passing it they usually take the channel East of Banditti Island. The channel West of this island may be taken, but it is very narrow. The middle channel, between Lombock and Banditti, might then be preferred, and afterwards to keep the Eastern side of the strait; from thence the strait of Macassar may be steered for, passing East of Hastings Island and the little island of Pulo-Laut; then the coast of Celebes, in order to enter the strait of Masassar.

When, instead of taking Lombock Strait that of Bally is adopted, with the view of entering the strait of Macassar, Northing should be made by passing through the channel between the islands of Pondy and Galion, then round to the West at a good distance the islands and banks of Kalkoon, and then passing the little Pulo-Laut on either side as appears best.

A vessel from Allass Strait would steer for Hastings Island, and pass East of it, the same as if coming from Lombock Strait. If from Sapy Strait, in September and October, she would, according to the prevailing winds, pass East or West of the Postillions, then North between Tanakeke and the Tongu Isles; she would then pass at a good distance the islands and banks of Spermonde, N.W. of the bay of Macassar, and would enter this strait, keeping on the coast of Celebes, to pass through. On clearing the strait, when off Cape Dundas, in about March or April, she would cross the sea of Celebes and steer for the Eastern end of Bassilan.

A vessel shaping her course for the channel between Bassilan and the West point of Mindanao, must be careful to keep well to the Eastward if the wind permits, in order that she may not be drifted by

the Westerly currents among the Sooloo Islands. If she finds herself to leeward of them, there are good channels between the islands situated West of the Sooloos; she would then cross the sea of Mindoro, keeping near the coast of the Philippines (Mindanao, Negros, Panay, Mindoro, and Luzon). At the entrance of the channel, between Mindanao and Negros, as well as between Panay and Mindoro, strong N.E. winds and Westerly currents are generally found. She would, therefore, guard against them when running from one island to another, so as not to be set to leeward.

If a ship leaves Bassilan Strait with steady S.W. or Southerly winds, she may steer direct for Point Naso, or a little East of its meridian: if the wind is changeable and uncertain, she would keep along Mindanao till Point Galera is reached, and then cross to Point Naso, endeavouring to keep near Negro Island in crossing from one point to the other.

From Point Naso she would steer North along the West coast of Panay, taking every precaution aginst the dangers lying off this coast, she would then pass the islands off the S.W. point of Mindoro, and enter the channel either East or West of them and the shore of Apo. To enter the East channel, in an Easterly wind, she would keep at six or nine miles from the coast of Mindoro; but with a Westerly wind, taking care not to go more than nine or ten miles from the coast until she is North of the Apo Banks, she would thus clear the strait of Mindoro, and after having doubled the promontory of Calavite, and passed Luban and Goat Island, she would follow the coast of Luzon as far as Cape Bolinao. When she has reached this cape, she may be pretty certain of passing East of the Pratas, and reaching Macao. However, it is prudent to steer North as far as Cape Bojador before crossing for the coast of China. At this season, also, when the sea of Celebes is reached, a vessel may enter the Pacific Ocean by passing South of Mindanao. For which purpose, if the wind permit, she would steer direct for the islands of Serangani, and afterwards pass between these islands and Mindanao, or else South of the former. From thence she would pass between the Meaugis and Tulour Isles, in order to double the North Cape of Morty Island, with the wind at N.E. Should any difficulty arise in taking this route, the channel formed by the islands of Tulour and Saugor would be adopted.

(To be continued.)

CAPTURE OF CANTON.

Head-Quarters, December 29th, 1857.

Sir,—It is with the highest feelings of satisfaction that I have the honour to report, for the information of the Lords Commissioners of

the Admiralty, that the city of Canton was assaulted this morning by the naval and military forces under the command of Rear-Admiral Sir Rigault de Genouilly; Major-General Van Strubenzee and myself, and was taken by escalade. Full particulars will be given by the next packet.

Our gratification at this quick success, with trifling loss, has been damped by a great calamity in the death of Captain Wm. Thorton Bate, of H.M.S. *Actæon*, who was killed by a gingall ball whilst reconnoitring a suitable spot for placing our scaling ladders.

This sad event has thrown a gloom over the whole force, Captain Bate being no less beloved for his many virtues, than respected and admired for his professional ability. By the death of Captain Bate her Majesty has lost a most able, zealous, and faithful servant.

We have the loss of another officer to deplore, Lieutenant Hackett, of the 59th Regiment, who, shortly after landing, was murdered by a party of Chinese soldiers.

I have only heard of two officers wounded, Lieut. Lord Gilford, of the *Calcutta*, severely, arm broken by a gingall ball; and Mr. Thompson, Midshipman, of the *Sanspareil*, severely wounded by a rocket.

I am busily employed with my gallant colleagues in securing our position.

I have, &c.

MICHAEL SEYMOUR,
Rear-Admiral and Commander-in-Chief.

To the Secretary of the Admiralty.

It is further added that the Govenor Yeh and the Tartar General are prisoners on board the *Inflexible*, the former having been taken disguised as a Coolie.

The following tribute to the memory of that excellent and highly esteemed officer, Capt. Bate, accompanies the despatch of the Admiral. Our own personal knowledge of Capt. Bate enables us to contribute our full confirmation of all that is there said, and to add, that his valuable survey of the whole island of Palawan and its innumerable adjacent dangers, will ever remain a memorial of the important services of this lamented officer in the scientific branch of his profession:—Services rendered too under difficulties of climate and character of the work as well as exposure to pirates, which enhance the value of the duties so ably performed by him. The account states that:—

"The advance on the Magazine or City-hill Fort, as it is variously termed, took place at nine a.m. yesterday. Capt. Bate was killed and Lieut. Lord Gilford wounded there. Capt. Bate, as usual, ever forward where duty called, was volunteering to place the scaling ladders, when he was shot from the wall through the stomach. He died, as he had lived, a Christian hero, with the sounds of victory ringing in his ears. The expedition could not have sustained a greater loss than the death of this excellent officer, not more remarkable for the sweetness

of his temper, the childlike purity of his life, than for the extent of his scientific acquirements and the shining splendour of his personal valour; this lamented officer in his life and death, was a bright example of the Christian hero. His rare intrepidity, his perfect self-command, his ready talent, rendered him one of the most valuable officers of the naval service. He was equally beloved by officers and men—superiors and inferiors. In the words of Southey respecting Nelson, he has fallen in the hour of victory, and if the horses and chariots of fire had been vouchsafed he could scarcely have departed in a brighter blaze of glory."

Most cordially do we concur in the foregoing sentiments respecting Capt. Bate, and deeply do we sympathise with the friends of that excellent officer in the irreparable loss which they have sustained.

RECENT BOTTLE PAPERS.

No.	Ship.	Signature.	Where Left.			Where Found.		Interval.
			When.	Lat. N.	Lng W.	Coast.	When.	
				°	°			YrDys
71*c*	Perseverance..	McDonald...	31 Oct. 56	19·3	48·4	Anegada	25 May 57	206
1*b*	Majestic	Hope	26 Apr. 57	48·2	6·2	Cape Clear, Ireland ...	24 Jun. 57	59
6*a*	Niger	Hire	8 Jan. 56	48·3	9·4	Dunaff Head, Ireland .	30 Sep. 56	265
114*b*	Hermes	Gordon	11 May 56	13 3	79 6	Cay West	12 Aug. 56	93
92*d*	Resistance	Bradshaw ...	8 Nov. 53	17·0	45·5	Antigua	13 Feb. 54	97
101*a*	Resistance	Bradshaw ...	17 No. 53	17·0	66·8	Aux Cayes, Haiti	16 Feb. 54	85
94*b*	Arachne	Inglefield ..	2 June 56	14·7	60·3	Tortola	29 Jun. 56	27
56*d*	Argyle	Harvey	16 Sep. 55	30·3	36 0	Palma, Canary Islands.	6 May 56	233
47*e*	Garrick	Foster	8 Apr. 55	51·6	29·1	Sheephaven, Ireland ..	17 Dec. 55	243
59*a*	Sir G. Seymour	Dile	10 Mar. 55	46·8	35 2	Bay of Fox, Galicia .	20 Apr. 56	406
40*c*	Pandora .. .	Drury	21 May 56	38·9	26·6	Villa Franca, S. Michl.	18 July 56	58
19*d*	Dryad	Chambers ..	30 Jan. 56	39·3	15·5	Vigo, Spain	5 May 56	95
65*a*	Sir G. Seymour	Dile	9 Mar 56	45·0	39·1	Martinique	9 Sept. 56	184
71*d*	Resistance	Bradshaw ..	12 July 53	12 6	45·5	St. Christopher	10 Oct. 53	90
9*b*	Polyphemus ..	Phillips	30 July 53	4·5	3·6	African Cape Asmee ..	8 Sept. 53	40
114*a*	Rover	Keele	17 Sep. 42	off C	Flor	Caicos, West Point ..	25 No. 46	4 69
119*b*	Thunder .. .	H. W. M. ..	1 May 47	27·8	86·7	Loggerhead Cay, Florida	16 Feb. 50	*
107*c*	Thunder	Barnett	7 Feb. 39	18·9	74·9	St. Domingo, S. point ..	20 Feb. 39	13
119*c*	Arachne	Inglefield ..	30 Mar.	22 9	87·2	Muston Island	17 July 57	
114*c*	Hermes	Coryton	15 Apr. 56	18 0	78·8	Padre Island.....	23 Aug. 57	1 130
122	Arachne	Inglefield ..	16 June 57	26 4	92·4	Matagorda	10 Sep. 57	86
90*a*	Resistance	Bradshaw ..	17 July 53	12·2	52·7	near Belize	23 Sep. 54	1 78
118*b*	Mariner	Palliser	20 July 56	22 6	86 3	Florida	17 Oct. 56	89
52*f*	Admiral	Perkin	17 Feb. 56	0 0	30 7	Aransas, Gulf Mexico..	25 Oct. 56	230
	Perseverance..	McDonald ..	28 Mar. 57	13 5	49	Porto Rico	25 July 57	119
32*b*	Graham	Henderson .	11 Feb. 55	3·7	20·0	Cape Palmas	16 May 56	1 94
	Cyclops	Pullen	6 Nov. 57	32 2	19·1	Porto Santo	6 Dec. 57	30
	Fulton.....	several	21 No. 57	50 9	18·3	Lewis Island	16 Jan. 58	56

* Wrong in list as 70*a*.

The Late Hydrographer to the Admiralty.

17, *Hanover Terrace, Regents Park,*
2nd February, 1858.

Sir,—In the *Nautical Magazine* of this month I observe a letter from Mrs. Heywood (the much respected widow of the late Captain Peter Heywood), adverting to a memoir of Admiral Sir Francis Beaufort which appeared in the *Daily News* on the 15th ultimo, and copying therefrom a sentence which purports to be an extract from the *Autobiography of Sir John Barrow.* The passage, Mrs. Heywood says, runs thus:—

"After the resignation of the Duke of Clarence as Lord High Admiral, Lord Melville again became First Lord, and one of his first objects was to fill the office of Hydrographer with the best man that could be found, who should hold it permanently. There were many applicants, but by 1829 two names only remained for a choice,—*and one of them at least was not an applicant,*—Captains Beaufort and Peter Heywood."

As the widow of Captain Peter Heywood she expresses herself anxious that the *truth* should be known, and therefore requests the Editor of the *Nautical Magazine* to insert her letter "in justice to the memory of her late husband, who never was an applicant for the office of Hydrographer, or any other public employment on shore."

Having seen a similar letter elsewhere, I have had the curiosity to look at my father's *Autobiography*, well knowing how extremely accurate he was, and it is with some satisfaction that I am enabled to state that the passage which has occasioned the correspondence does not exist in the offensive manner quoted, and which has proved hurtful to Mrs. Heywood's feelings. I now give it you verbatim as it stands in the *Autobiography*, page 394:—

"Various applications were made and duly considered, but no choice was fixed until 1829, when the candidates were reduced to two, both of them considered to be unexceptionable: these were Captain Peter Heywood and Captain Francis Beaufort. Lord Melville being a cautious and conscientious man, felt a reluctance to take the decision on himself, and requested Mr. Croker and me to name the one whom we considered in all respects best qualified and most suited for the office, and he would immediately appoint him. We had little or no hesitation in assigning the palm to Captain Beaufort.

"It could not be otherwise, as far as I was concerned, that my mind should at once be made up. In Mr. Yorke's reign I had, at his request, selected Captain Beaufort, and his ship, out of the whole Mediterranean fleet, to be sent to survey an unknown portion of the coast of Syria: of which in due time he published an account, under the name of *Karamania*, containing not merely the survey, but also an historical account of the numerous remains of antiquity on the several points examined on that coast,—a book superior to any of its kind in whatever language, and one which passed triumphantly through the ordeal of criticism in every nation of Europe."

Such is the passage in my father's work,—honourable alike to both officers, each being spoken of as unexceptionable. Whether each or either were candidates appears to me of little importance, but the records of the Admiralty will probably show.

I am, &c.,

JOHN BARROW.

[Nothing that is stated by either Sir John Barrow or his son affects the assertion of Mrs. Heywood that her late husband was not an applicant for the station as insinuated in the memoir, but actually recommended Captain Beaufort for it. We take some blame to ourselves for not setting the false quotation right before. We have already expressed our opinion of the memoir alluded to, but did not imagine that the partiality of the writer would have led to *Sir John Barrow's* book being quoted for what it does not contain! Such friends, all the world knows, do more harm than good.—ED.]

NAUTICAL NOTICES.

PARTICULARS OF LIGHTS RECENTLY ESTABLISHED.

(Continued from p. 108.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
10. Port Phillip, Australia		Swan Spit, V				Est. 15th Nov., '57. In light-vessel a white light substituted for former red one.
11. Dielette, France	Pier Head	49° 33·1′ N., 1° 51·8′ W.	F.	23	5	Est. 1st Feb., '58.
		S.E. 160 yds. from former	F.	75	9	Ditto.
Douarnenez Bay	Tristan Isl.	48° 6·2′ N., 4° 21·4′ W.	F.	114	10	Ditto.
Lanriec		47° 52′ N., 3° 54·7′ W.	F.	42	9	Ditto. Red.
12. Florida Reefs	Coffin Patches	24° 37 6′ N., 81° 6·7′ W.	F.	141	19	Est. 15th March On iron piles.
Carysfort Reef	Dry Bank	25° 13·2′ N., 80°12·7′W.	R.	106	18	Ditto. Flash every half minute.
13. Cape Flattery	Tatouch Isl.	48° 23·2′ N., 124° 43·8′ W.	F.	162	19	Est. 28th Dec., '57.
Juan de Fuca Strait	New Dungeness	48° 11·8′ N., 123°7·5′W.	F	100	15	Est. 14th Dec., '57. Fog bell on end of Spit.
14. Barataria B. U. S.	Fort Livingstone	29° 16·7′ N., 89°54·5′W.	F.	60	13	
Timballier B. U. S.	Grand Pass, West S.	29° 4′ N., 90° 16·5′ W.	F.	60	13	
15. Cape Santa Polla, Spain	Talaydor Tower	38° 12·5′ N., 0° 30·1′ E.	F.	505	5	Est. 23rd Jan., '58. Visible seen bearing S.W.¼S. to N.N.E.¾E.
16. Formiche I., Sicily, W.C.	Off Trapani	38° 0·8′ N., 12° 26′ E.	F.	85	10	Est. 1st March, '58. Largest islet.
17. Kronstat	Fort Nicholas		F. F.		9	Lights an arc of 10° from W. 18° N. to W. 28° N. Red. Lights in one lead up the channel.

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

We insert the following from the *Shipping Gazette*, as there may be something in it,—but we place no confidence in the position assigned, either in latitude or longitude:—

"*Sydney, N.S.W.* December 10th. The *John Wesley* has returned after a lengthy cruize among the South Sea Islands. She brings up the mate and three hands belonging to the *Palermo*, wrecked some months since near Soma Soma. The following extract from the log may prove interesting. 'August 6th. Sighted an island lately thrown up of volcanic origin; it is situated in lat. 19° 16′ S., long. 155° E. On the 27th, sounded round the island, but found no bottom at 45 fathoms. The island was on fire all over. Shoal water was found on S.S.W. side, but the land was steep on North and West sides.'"

China Sea,—*Truro Shoal.*—The following has been received by the Secretary to the Board of Trade:—"Sir,—On my passage from Singapore to Hong Kong, on September 30th, 1857, whilst taking my forenoon observation for longitude, I looked down at the water and distinctly saw the bottom (white coral). Got a cast of the lead instantly at 10 fathoms; again about half a mile more North, got 19 fathoms; still steered North for another half mile, got 22 fathoms, and the next time no bottom at 40 fathoms. I went to the mast-head, but could not discover with the eye any shoaler patches. The 10 fathoms cast was, by good observations, in lat. 16° 19′ N., long. 116° 41′ E. As there is nothing of the kind marked on any chart, I have called it the Truro Shoal.—I am, &c., Thomas Joseph Duggan, Master of the barque *Truro*."

Strait of Banca and Rhio.—The *Moniteur de la Flotte* cautions seamen against expecting to find the buoys in the strait of Rhio in their places. The buoy N.W. of Lucipara Island is gone; but that on the Frederick Hendrick Shoal is in its place.

Maritime Official Inquiry.—*Loss of the Ship "Lady Kennaway," of London.*

East London, Cape of Good Hope, Dec. 12th, 1857.

The Chief Commisioner of British Kaffraria having been pleased to nominate a Court for the purpose of inquiring into the circumstances attending the stranding of the ship *Lady Kennaway*, (584,) on the afternoon of November 25th, 1857, we, the undersigned, having been members of the said Court, after a very patient and careful inquiry, and from all the evidence we can obtain, do now give our opinion as follows:—

From the evidence produced, the Court is of opinion that the ship *Lady Kennaway* brought up in a safe berth in the roadstead off the Buffalo Mouth, in 12½ fathoms of water, one mile and a quarter from the shore; that although the wind on the day she was stranded was blowing a gale from E.S.E., the position of the ship was one of safety.

It appears that to an anchor of 27 cwt. on the starboard side, she had from the anchor to the 30 fathom shackle an old and much worn 1¼-inch chain; from the 30 to the 90 fathom shackle a new chain of 1¼-inch; and from this to where the cable was clenched round the waist there was a length of 15 fathoms again of old 1¼-inch chain—in all 105 fathoms, and a much worn 1¼-inch chain only 105 fathoms in length, on to an anchor of 23 cwt. as port bower.

The Court is therefore of opinion that the cables were much worn, a great deal too light, and considerably short of the length fixed by Lloyd's as the scale for a vessel of the tonnage of the *Lady Kennaway*.

The Court is also of opinion that the ship was not supplied with proper means for stoppering the chains: and even had the vessel been provided with them, the manner in which the immigrants' cook-house came out over the ring-bolts in the deck quite precluded the possibility of the chain being properly ranged along the deck, as well as the stoppers being made fast to a place where they were likely to be of any material service.

It also appears, upon the ship parting the second time, no third anchor was in readiness for letting go—an omission showing, in the Court's opinion, great neglect; and it is possible that, had a third anchor been let go on the ship's head canting in shore, it would have brought her head again to seaward, and enabled her to stand off shore.

The Court is also of opinion that as the wind and the current with the sea were setting along the coast, rather off than otherwise, that the ship, after parting a second cable, might have been wore and got clear off the land had the proper means been adopted. Further, there can be no dobbt there was an error in judgment in setting the main trysail and mizen, as these sails appeared from the shore to be fully set; and this, in the Court's opinion, prevented the ship from wearing and drove her on shore.

MATTHEW JENNINGS, Resident Magistrate.
W. J. FAGAN, D.-A.-C. General.
GEO. WALKER, Harbour Master.
H. S. PYBUS.
S. RICH, Master of the brig *Unity*.

Sayings and Doings.

It is said that the *Euryalus*, 51, screw frigate, is to be forthwith commissioned at Devonport by Capt. John W. Tarleton, C.B. Report says that his Royal Highness Prince Alfred will be appointed to this fine frigate, probably with a number of other cadets, and that she is to be employed as a training ship in a three years' voyage round the world.

The *Himalaya*, on her way from the Cape, with 250 horses, broke down not far from Ceylon, and it is stated that, forage running short, it had been determined to sacrifice one half of the horses in order to save the remainder, when the *Mohawk* came on the scene and towed the *Himalaya* into Galle. Thence she has been towed to Calcutta by the *Australian* (s.), which, with the *Sydney*, took on the troops arrived in the *Gamecock*, *Trafalgar*, and *John Knox*.

Capt. Bevis, R.N., who has held the post of Admiralty Agent at Liverpool for nearly twenty years, is about to retire, having been promoted to the rank of post captain. Capt. Bevis will be succeeded by Comdr. Goldfinch.

THE PASSAGE OF THE EURIPUS—(Straits of Negropont) has been opened to navigation, and the following rates of tolls have been adopted for vessels passing through:—

Vessels of 20 tons, 50 leptas per ton.
Vessels from 20 to 50 tons, 30 leptas per ton.
Vessels from 50 to 100 tons, 20 leptas per ton.
Vessels from 100 to 300 tons, 15 leptas per ton.
Vessels above 300 tons, 10 leptas per ton.
Ten leptas are nearly equal to a penny.

Mr. Miller, one of the members of the engineering firm of Bell and Miller, Glasgow, who have been consulted respecting the erection of a new slip in the harbour at Kingston, Jamaica, arrived in the *Atrato*, and will proceed immediately to make the surveys necessary to enable him to furnish a precise estimate of the materials, labour, and cost of this important and interesting work.—*Jamaica Dispatch.* [We understand that the proposed slip is intended to accommodate vessels of 3,000 tons.]—*Greenock Advertiser.*

Annexed is an amended list of the gold ships on their way from Australia to this country; the amounts differ in some cases from the sums announced by telegraph:—The *Marco Polo* sailed 24th of October with 73,704 ounces; the *Northumberland*, 28th, 46,881 ounces; the *Oliver Lang*, 18th of November, 47,442 ounces; the *Austral*, 18th, 10.284 ounces; the *Sea Breeze*, 23rd, 23,910 ounces; the *Blackwall*, 30th, 68,080 ounces; and the *Donald M'Kay*, 5th of December, with 23,218 ounces,—value in all £1,174,076, exclusive of £100,803 expected in a few days by the *Tamar*.

A letter from Capt. Ryan, of the ship *Lyon*, received at Boston, and dated Anjer, November 22nd, states that a mutiny had taken place on board the Baltimore ship *Kate Hooper*, laden with Coolies for Havana, whilst lying in the harbour of Anjers. The Coolies set the ship on fire three times. Before the mutiny could be suppressed the officers were compelled to shoot fifty of the Coolies.—*New York Herald.*

It is rumoured that the new Collins monster steamer *Adriatic*, has been sold to the Russian Government. The price is said to be about £200,000.

The number of wrecks ascertained to have taken place on the British shores during January was 154.

The Hon. Mr. George Jerningham, Secretary of Legation at Rio Janeiro, is appointed Chargé d'Affaires and Consul-General for Peru, in the room of Mr. Stephen Henry Sullivan, deceased.

The *Philadelphia*, which arrived at Liverpool on Sunday from Philadelphia, was struck with lightning during a heavy squall, in lat. 48°, long. 45° by which two men were killed and three badly wounded.

TO CORRESPONDENTS.

CLEARING THE DISTANCE.—We have been obliged to defer Mr. Hebden's letter for our next.

We have received Mr. Birt's communication, but cannot find room for disquisitions on a subject to shake the faith of seamen in established laws—until these are set aside.

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

APRIL, 1858.

The Navigation of the Danube.

One of the questions which chiefly occupy the attention of the principal European powers at the present moment, is the Navigation of the Danube. The Austrian Government, foreseeing the future importance of this great river, which traverses Europe from one extremity to the other in a course of 700 leagues, encouraged measures which, at their commencement, were looked upon as rash; but which perseverance has proved to be successful. The Imperial Company of the Danube at present has more than 100 steamers and 500 river boats on the line from Lintz to Galatz; and the Lloyd's Company run their boats as far as this town. Under the protection of the Ottoman Government Greek vessels frequent the Danube for grain, essential to the subsistence of the less fruitful provinces of their country; and England, France, and Italy have since been obliged to seek from the fertile plains on the shores of the Black Sea those supplies of a similar nature necessary for their consumption.

Of the great results of the late war must be placed among the foremost, those measures which could not fail to improve the navigation of the Danube. It is known that with this view two commissions were appointed, one of which was composed of delegates from the banks of the river, to establish and carry into effect regulations by which the future navigation should be carried on in conformity with the principles of free navigation. This commission was also charged with improving

the course of the river from the point where it becomes navigable to Tsatika, five leagues from the Black Sea. The second commission had for its object the consideration of the lower Danube, and particularly the opening of a good channel into the Black Sea.

The town of Ibraila may be considered perhaps the extreme point to which vessels from sea ascend the Danube. They may go higher up, and even, when the waters are high, as far as the Iron Gates at the frontier of Hungary. But beyond Ibraila the banks become numerous, the bed of the river is more uneven, and there are no commercial towns beyond it worth going to. Thus, a small number only go to Silistria, Giurgevo, Rustchuck, and Widdin, whilst the great majority stop and load at Ibraila and Galatz, to which places the produce of the upper country is conveyed by floats and schleps of the Austrian Company.

Ibraila, at forty leagues from the sea, and Galatz at twelve miles lower, are then the two considerable ports towards which an easy access should be secured for mercantile vessels. The first receives the produce of Wallachia, the other that of Moldavia; they export wood for building, tallow, leather, wool, and an immense quantity of grain, employing thus from two to three thousand vessels annually.

From Ibraila to twelve miles below Isatcha, the Danube, in a course of fifty-five nautical miles, is 540 yards wide, and sometimes more than a mile. It is four or five fathoms deep everywhere, and takes large bends in its course, that do not interrupt the navigation. It flows by Galatz, Reni, an old Russian town, now Moldavian, and the Turkish town of Isatcha; and having received in this distance the Sereth and the Pruth, forms a large body of water, estimated, at the time of the driest seasons, at 10,000,000 cubic feet per minute.

Twelve miles below Isatcha, and some twenty leagues in a direct line from the sea, commences the delta of the Danube. By this name is included the land watered by the several arms into which the river is divided before it reaches the sea. Bounded on the North by the arm which flows by Bessarabia, and on the South by the St. George arm, the course of the Dunavetze, and Lake Ragelon; it forms a great triangle, the apex of which is at the first point of separation of the waters of the river, and the base of which is formed by sixty miles of coast of the Black Sea. The superficial extent of this delta may be approximately estimated at six hundred square miles, and is composed of many islands intersected by lakes. It contains two forests, and meadows which are highly favourable for pasture; but a great part of this low land, uniformly flat and often covered by water, only abounds in reeds of no value, and are scarcely even varied by willows. Some half dozen miserable villages and a few fishermen's huts, are the only dwellings to be seen there; for besides the conventions in ancient treaties between Turkey and Russia, a barren soil, unhealthy and extensive marshes, and the absence of all communication during winter, have entirely prevented any access of population. It is across this territory, without doubt formed by its deposits, and

where there is not a stone to be seen, that the Danube takes its course to the sea. The waters flow sluggishly through it, with a descent of scarcely three inches in a mile; the course also is it the result of their extraordinary sinuosities, for it penetrates easily into the yielding soil, and spreads into numerous channels. Nevertheless, they form three principal branches as the deepest embouchures, which call for exclusive attention.

Of the two branches which carry the waters of the Danube from the apex of the delta, one flows Southward towards the Turkish village of Toultcha, and the other continues along the Bessarabian territory. This latter is known by the name of the Kilia branch, and receives more than six tenths of the waters of the river. The length of its course is sixty-eight miles. It forms a magnificent channel, which attains a breadth of 324 yards, and the mean depth of which is from twelve to fourteen yards. It passes close to Ismael, Kilia, and Vilkovi, where it is concentrated about five miles from the sea, and forms an extensive basin. It then divides into four channels, which fall into the sea by a great number of streams, more or less interrupted by sand banks. The Ochakov channel, which is the deepest, has a bar 1,312 yards across, on which there is scarcely five and a half or six feet water. The Kilia branch is not adopted in consequence of the small depth of water on the bars at its mouths, and the towns of Ismail and Kilia, which formerly enjoyed some commerce, have lost all their prosperity.

The branch which flows towards Toultcha, after having run eighteen miles in a uniform bed, is divided at nine miles below that place, and forms the two arms of Sulina and St. George. At this point of separation it seems as if the road to the sea lay through the beautiful and imposing channel of St. George, whilst on the contrary it is to be found in the narrow channel of the Sulina, for the bar being less than the other, and having more water over it, there navigation follows. But, in consequence of the difficulties met with, although the vessels have not more than forty-five miles to go, they often take more than fifteen days to get up it. The breadth of the Sulina is sometimes as little as eighty-two yards; its depth is from sixteen to twenty-three feet, and is beset with sand banks. But the most formidable dangers arise from the vessels themselves, which, by acts of barratry, of which the Greeks are often guilty, are cast away here and there in great numbers, and the hulls partly buried in the mud leave no trace whatever above water. Such obstacles, however, do not dishearten European commerce. During the war of 1855 nearly 4,000 vessels passed up the Sulina without the aid of steam. This channel is bordered on both sides by fields of reeds, extending many leagues, where not a house is to be seen. Such is the only road for arriving at the abundant granaries of Moldo-Wallachia.

Recent calculations have established the fact that the Sulina receives a fifth part of the waters passing by Toultcha, and that the St. George arm receives the remainder. But the relative importance of this last channel appears more evident on examining its course,

which, in a length of fifty-one miles, has always a breadth of from 220 to 440 yards, and a depth of eight to ten yards. The St. George's channel has a chain of mountains on its right bank, commencing at Toultcha and continuing as far as Thalweg, and which are covered with wood and meadows. Numerous flocks are seen there, some traces of cultivation, and two or three towns, which appear to be tolerably populous. The whole of the opposite bank and the right bank from Dunovetza, are flat, and there again the reeds of the Sulina appear, but here they are broken by clumps of trees. But what proves the ground there to be drier and more habitable, are numerous huts of fishermen, with the towns of Pieslaw, Vuzlia, Ivancha, and the more important one Kedriles.

The mouth of the St. George has a breadth of 766 yards, and also a large interior basin, the regular depth of which (eighteen feet) admits a numerous fleet to find shelter from the winds and sea outside. But having seen the advantages of the St. George branch, we shall now allude to the difficulties presented by its bar. The mouth of this branch is divided into three channels by two small islets. Of the three openings the two southern ones appear perpetually shut by a tongue of land which extends nearly three miles seaward. The depth of the third arm is not more than six feet towards the sea. Such obstacle must be removed by powerful dredging and the construction of dykes, the great length of which will doubtless render them very expensive.

With regard to the subject of navigation, the question is, which of the three branches would be the most advantageous to improve. One is immediately struck by the inferiority of the Sulina, now frequented, the straight and sinuous course of which traverses an unwholesome country, uninhabitable, and destitute of resources. The Kilia branch, were its spreading waters limited, and its course more direct, would be better; but the St. George channel, thirty miles nearer the Bosphorus than the Kilia, that would receive the largest merchant vessels, and has a most easy approach, by the necessary expense would become one of the finest navigable highways which it is possible to imagine.

The waters of the Danube, if we are to believe the accounts which we have collected, have been lower this year than they have been known for forty years; the bed of the river also, which had never been closely looked into, has presented dangers hitherto unknown. The Austrian Company of the Danube only has good pilots; their vessels, which make frequent voyages on the river, have two or three in each, and these always keep the lead going.

By this means they study the river, knowing at any moment the best course to be adopted for avoiding dangers, and noting the shifting of banks that so often takes place in a very few days, and which constitutes one of the principal difficulties of navigation, especially under its present condition. Yet, in spite of all their precautions, these vessels frequently take the ground and are sometimes wrecked.

The vessels that do not belong to this Company, when they go up

the river are very badly off. A pilot may be very well acquainted with the lower Danube, when the river is high; but it is far different when low, especially when it is considered that sand banks are frequently displaced, and that there is no beacon nor buoy to render any assistance to the pilot. It becomes necessary then to take pilots from the country boats. These men know very well that part of the river which they are accustomed to navigate; but it almost always happens that they have not been for months in the part for which they engage to pilot the ships, and that they make mistakes in consequence of the shifting of the banks since their last voyage.

In coming down the river the current considerably increases the velocity of the vessel, and it becomes necessary to use great precautions, and to keep the lead constantly going. It will happen that a vessel after having entered a channel finds it obstructed, and is obliged to turn back and seek for another. When these channels cross the river they become particularly difficult; the river then is nearly always wider, its depth becomes less, and it is necessary to leave one of the banks and cross to the other in very narrow channels of several hundred yards in length, in which, at the present time, there is not more than six feet or so of water, and sometimes less, and in the whole length of which the current sets across the course of the vessel with greater force there than in any other part. Under these circumstances, and in spite of every precaution, if an unfortunate touch of the ground takes place, or a sudden irregularity of the bottom, the loss of the ship is certain.

It is difficult, as may be well imagined, to point out exactly the position of these passes, from the absence of marks, and the want of a convenient chart to mark them. There are about fifteen from Galatz to Tourno Severin. The first is opposite to the mouth of the River Kustendje, the second is about fifteen miles below Silistria, another ten miles below Oltenitza, another very bad one at eleven miles below Guergevo, another about the same distance above Routschoug, and another eight miles below Sistova.

Two miles below this same town, when the river is low, navigators must be careful to avoid a rock which lies in the very middle of it. There is nothing to indicate it, but it may be avoided by borrowing on either of the banks. There is a bad channel at the commencement of the banks of Sistova, another at two miles, and a third at eight miles above the same town. At eight miles and at two miles below Nicopolis, there are also two others. At two miles and also at nine miles above this town, there are two more, and in the remainder of the river as far as Tourno Severin, there are only two: one off Czibra and the other off Lom-Polanka. The depth of these passes was recently six feet. In many of them there was not more than six feet, and sometimes five and a quarter feet. Besides these there were some shoaler passes; but lying in the direction of the current they are less dangerous. The velocity of the current between Galatz and Nicopolis is from one mile to a mile and a half and two miles an hour, as far as Widdin it is two miles to two miles and a half, and to the

bridge of Trajan it is two miles and a half to three miles; it then becomes variable, and from three to five and even six miles an hour as far as the Iron Gates. In the parts abovementioned, which are shallow, the greatest velocity of the current is half a mile an hour at least. The depth of the river, except in the difficult passes, is nearly everywhere about three fathoms.

To render the navigation of the Danube safe it would be particularly useful to establish pilot-stations at many points of its course; but this would be attended with great expense, which the want of navigation on the river does not admit of being reimbursed. But if this is not to be attained in the actual state of things, there is another which might be easily obtained and which would be of great service to ships bound up the river. There is nothing to indicate the difficult passes: the sameness of the banks, the towns, scarce and nearly always without names, afford no means of recognising these passes. The only chart of the river is that of the Company of the Danube, and that is so bad that it does more harm than good. But as the Wallachian Government have a line of posts on the left bank of the river for the surveillance of the frontier, it would be easy to number these guard-houses, as the Russians have done from the Sulina to the mouth of the Pruth. These stations would then become marks for showing the difficult passes, and beacons might be placed on the banks to indicate their direction.

It would also be important to establish guages in different parts of the river to show the height of the water with reference to an assumed mark, by which ships would know the depth of water they would find in the passes that they have to go through, and would take measures accordingly. The dangerous banks also should be buoyed, and marks might be placed on the banks of the river to lead vessels clear of them. By such simple measures the dangers of navigation would be very much diminished. As for the rest, in the whole of the Danube, the river is in its natural state, and all that can be done is to facilitate the navigation.

In respect of the Iron Gates, the most serious obstacle of the Danube, they consist of a succession of beds of rock which lie across its course throughout an extent of 4,680 yards. The greater part of these rocks are above water, some of them about three feet above the surface of the river. Between the two extremes of them recent observations have shown that there is a difference of level of nearly nineteen feet: hence the strength of the current, which in some places attains a velocity of from five to six miles an hour, and where the water is pent up by the rocks the velocity is said to reach seven to eight miles. Throughout this extent of 4,280 yards the depths are very variable. Some twenty miles above the Iron Gates, before reaching the Austrian town of Drenkova, there are five other rocky barriers, which entirely interrupt the navigation when the river is low.

In this extent of the river, of about thirty miles, from the upper bank of Drenkova to the lower part of that of the Iron Gates, the

Danube flows between the faces of very high mountains, which are often perpendicular, rendering it impossible to construct a canal in order to avoid these obstacles. Will it be possible to divert the course of the river by cutting a canal for it, and to obviate the difficulties occasioned by the difference of level through the means of sluices? This is a question for engineers.

Several persons have considered that they had found at the Iron Gates, on the Servian bank of the river, a canal, which they have attributed to the Romans, with the view of avoiding the obstacle presented by these rocks. The supposition, however, is by no means certain. First, the bed of this canal is higher than that of the river, then it is not extensive and never could be, because in a part of its course it is interrupted by the foot of a neighbouring mountain, which reaches to the bank of the river itself. Again, on examining carefully the barriers of Drenkova it is impossible not to be struck by a circumstance which throws considerable light on the object of the dykes, the remains of which are found at the Iron Gates.

Each of these barriers is found exactly opposite to a torrent; the beds of these torrents, now dry, are encumbered with large rocks: they are very steep. The current must be very rapid to have thrown into the river these rocks, which have contributed to form the obstacles which obstruct its course. This hypothesis being admitted, the dykes constructed by the Romans at the Iron Gates can easily be explained. These dykes are also found crossing the course of the neighbouring mountain torrents, the beds of which, wide and very steep, are encumbered with stones. In fact, without arresting the course of the waters, which they simply turn, they might have been for the purpose of retaining the stones; and if this be the case the great quantity of fragments of rocks scattered in the bed of the supposed canal will prove that the object was attained. Nevertheless, one of these torrents has broken the dyke opposed to it, and in the breach the ground is observed to be covered with the same stones, which reach to the Danube, forming a bank which joins the Iron Gates, leaving only a small channel, so narrow that fishing-boats can scarcely pass through it.

The Danube has been entirely frozen over since the 5th of January; the ice is fifteen inches thick at least, and the river is everywhere very low; but the great quantity of snow which has fallen for some days when the thaw comes will produce a considerable rise. It is this rising of the waters in fact that breaks up the ice, and the masses of it carried by a rapid current produce the most disastrous effects on everything that resists it. The French vessels, happily for them, are beyond the action of this current. The *Averne* is fastened to the quay with double lashings; a floating shield has been fixed before her stem, and her wheels and hull have been fortified with thick bundles of reeds, to protect her from being rubbed by the ice.

When the river is suddenly frozen over in a single night, some merchant vessels have generally allowed themselves to be caught in bad positions, and those which cannot extricate themselves, run the

risk of being stove and sunk. A Sardinian brig was thus caught off Galatz in the middle of the river. She neglected to get away at the proper time from her dangerous position, which became critical, and in the attempt it became impossible to do so until the ice cleared away.

All activity ceases at Galatz with navigation, but those who are no longer absorbed by commercial operations do not trouble themselves with political matters, and one would not suspect by the indifference of the country people that their destinies are the subject of discussion throughout the whole European press. They interest themselves more in questions of the freedom of the Danube and the improvement of its navigation; but on this point, like all that concerns the Principalities, everything is in embryo. The Riverain Commission has produced a navigation law which the Western powers will not accept, at least without discussion, and the European Commission has decided on nothing, as far as is known, on the works to be undertaken in the lower Danube.

The *Lloyd* of Pesth says:—"The works undertaken in the Danube to blow up the rocks of the Iron Gates, which were last year urged on very actively, have now been resumed, and the low state of the water leads to the hope that excellent results will be speedily arrived at. Not fewer than 300 workmen are employed, and since the 8th of January 275 blasts have taken place with good effect. One rock, which was four feet above high water mark, has been so completely removed that not only small steamers but even large vessels can effect a passage over it. Near Razia Bona, in the river, some hundreds of large cannon-balls, three anchors, and some Roman coin in copper and silver, have been found."

We find the foregoing in a recent number or two of the *Moniteur de la Flotte*. In reference to the engineering operations we also add the note annexed to it, and may observe, as regards the *mouth* to which those operations refer, that we entirely agree with the author in considering that the St. George is to be preferred. And, as the skilful engineer knows well that he must work with Nature if he can, or at all events he will do it at his cost if he attempts to oppose her, he will immediately see that the long tongue of land forming the Eastern bank of the mouth of the St. George is nature's own work, produced by the prevailing N.E. and Northerly winds, as well as by the action of the wash of the wave and the current in the Black Sea. He would therefore encourage it by protecting the point as it extends Southward, keeping the entrance open and from being silted up by it, having also the channel deepened by the usual means. We have no doubt that the noble harbour would thus be formed to which the *Moniteur* alludes. Much, however, remains to be done both in the delta and above it before the Commission will have concluded its

labours: but such recommendations of the *Moniteur* would go far to secure the desired improvement.

On the subject of navigation much is to be considered in the way of pilotage. The *Moniteur* has truly pointed out why so much ignorance prevails on the part of these pilots. But it would appear from a letter signed a Sea Dog, which we borrow from the *Shipping Gazette*, that a system of plunder in which they are deeply implicated is carried on, that should be stopped. We commend the observations of the "Sea Dog" to the attention of shipmasters and owners.

Cross Channel, February 1st, 1858.

Sir,—Having some experience on the River Danube, I have been prompted by feelings of humanity and justice to make public a few of the many impositions practised upon shipping frequenting that place, more especially if the Master is a stranger, and not up to the moves.

It is customary to engage a pilot at Constantinople, the amount to be paid for his services as per agreement, which agreement the ship-chandler invariably writes out and witnesses, for which service he claims from the pilot four or eight ducats, according to the amount agreed upon, which, the better to ensure his part of profits, is not to be paid until the vessel arrives again at Constantinople. The said pilot is highly recommended as most efficient, &c. When arrived in the river the Master finds to his cost and sorrow that he knows no more about handling the vessel, comparatively, than a cow does a musket, and in many instances they know no more about the river than the Master, though he is a perfect stranger. Instances have been known of their stopping the vessels at Reni, mistaking it for Galatz. But, generally speaking, they depend upon the track-men taken at Sulina to navigate the vessels, being customary to get two or three to assist the crew in tracking the vessel up the river.

Having arrived at the place of loading, the pilot keeps a constant look-out for the number of killoes at a certain depth of water the vessel has in. In the meantime the pilot insinuates himself into the good graces of the Master, laments the great cost of lighterage, to draw the Master into unsuspecting confidence, then remarks the probable amount of killoes necessary to lighten the vessel over the shoals and bar of Sulina, and eventually suggests that he would take the lightering for so much, being considerably less than the Master could possibly get it done for, particularly as the water is much less on the shoals than when they came up, and the lighters are dearer; finally, that it would be a great saving to owners, &c., and would save the Master much unnecessary trouble and anxiety.

As there are varieties of flowers so there are varieties of men. Many, not suspecting the duplicity of these patriots, as most of them are natives of the Ionian Islands, commit at once their trust to them to be duped. Others, more wary and sagacious, apply to the ship-

chandler for information, who invariably is recommended by the pilots, and, as a matter of course, pulls upon the same rope, giving his verdict for the pilot. Next he sounds the other pilots, who are generally tarred with the same brush, unless there is a probability of supplanting the original, then they may come somewhat nearer the truth. As a last resort he applies to the Consul, who is usually too busy or entirely ignorant on the subject, recommending him to do the best he can. Finding his efforts in vain to obtain information, and being constantly goaded with the idea that he would have to pay so much more, &c., his self-reliance, so necessary in all cases of emergency, gives way, and he submits to be duped to the tune of from one to £120.

I know vessels of from 1,400 to 1,700 quarters paying £190, and even £280, when at the same time others of the same size, and even larger, have only paid £120 and £180, and had not the former paid so much, might have obtained lighters for £80 or £100;—the fact of their paying so much caused the lightermen to look for exorbitant prices. I know an instance, from good authority, of a vessel paying £180 to the pilot to clear all shoals and bars. On arrival at Tulcha he obtained the lighters for £80, the pilot, with another, pocketing the difference.

Having endeavoured to point out the most glaring evils, &c., now for the remedy, which is simple enough, if attended to. First—Engage the pilot at Sulina; let him fully understand that he has nothing to do with the lightering. Secondly—Do not engage lighters until arrived downwards at Tulcha, where he can ascertain the amount of water on all the shoals. If there be no lighters let him wait a few days until they arrive from Sulina. He will then get them reasonable according to the season of the year, in the winter quarter they are generally dearer.

The merchants would confer a great benefit on themselves and vessels, did they appoint some person to look after those lighters at Sulina, as they are in the habit of pilfering or retaining a quantity of the cargo before and after they have delivered it outside the bar.

If you think these few remarks are calculated to confer a benefit upon vessels frequenting the Danube, I should feel obliged by your inserting them in your valuable paper.

I am, &c.,

A Sea Dog.

To the Editor of the Shipping Gazette.

It appears also that the steamer *Avergne* and the *Meurtriare* took up their winter stations off Galatz; the former occupying that of the *Alert* last winter, and the latter a position belonging to a Russian company, which was offered to her captain by the Russian commissary, being free from the influence of the current, and where she might be protected from the effects of the ice. There remain not more than

about a hundred European merchant vessels in the river, part of which will not leave it until the spring.

The Turkish flotilla, composed of four schooners, are secured for the winter under the rock of Toultcha. The *Medina*, Capt. Spratt, which has gone from Kilia to Constantinople, it is said will immediately be replaced by the *Boxer*. There will thus be in the river this winter the following men-of-war:—English, *Weser* and *Boxer;* Austrian, *Taurus* and *Croatia;* Sardinian, *Anthione.*

HAKODADI.

The town of Hakodadi or Hakodate, lies on the southern coast of Yesso, in lat. 41° 49′ 22″ N., and long. 140° 47′ 45″ E., being situated on the western bank of a small peninsula, which forms one side of the harbour. The meaning of the Japanese word Hakodadi, is "box shop;" but what gave rise to the name it is not easy to understand, as some of the best informed inhabitants themselves seem unacquainted with the origin of the term.

The appearance of the place on entering the harbour is striking and picturesque. The town stretches for the space of three miles along the base of a lofty promontory, divided into three principal peaks, which reach to the height of from 600 to 1,000 feet. Their lofty summits are bare, and often covered with snow; their upper slopes are but scantily clothed with underwood and some scattered pines, while below, where the mountains begin to rise from the level land, there is a rich profusion of verdant growth, with groves of wide-spreading cypresses, tall forest maples, and fruit-bearing trees, the plum and the peach. This vegetation presents a pleasing contrast to the bolder and more barren aspect of the higher acclivities and summits of the surrounding hills. The town thus appears to be nestling in repose under the cover of the shade of the trees in the midst of a scene of rural beauty, while all around in the distance is the wild, bleak massiveness of nature.

A low sandy isthmus, scantily verdant here and there with a few patches of kitchen-garden, connects the peninsula on which the houses are built with the main land. Coarse hard rocks of trachyte, thrown up by volcanic agency, separate the alluvial sand from the mountainous region in the interior, and add to the wildness of the scene. The Japanese have quarried the rocks here and there, and various hewn surfaces, with cut blocks lying about, prove the art and industry of the people. These quarries supply them with stone for constructing their sea walls, jetties, dykes, foundations for their houses, and other building purposes.

The town contains over a thousand houses, which mostly stretch along in one main thoroughfare near the sea side; while the re-

mainder, forming two or three parallel streets, hang upon the ascent of the hill in the rear. Every one on board the ships who had visited Gibraltar was struck with the resemblance of Hakodadi from its position and general aspect to that famous fortified town. There was the isolated hill, on the base and acclivity of which the houses were built, corresponding to the rock of Gibraltar; there was the low neck of land reaching to the elevated region beyond, like the neutral ground which separates the English fortress from the Spanish territory, and a receding country and capacious bay surrounding Hakodadi as well as Gibraltar, to strengthen the resemblance between the two. Moreover, the position of the Japanese town on the strait of Saugar, with the high land of Nippon and its towers of Say and Mimaga at the South, like that of Gibraltar, overlooking the narrow channel which connects the Atlantic and Mediterranean, and commands the opposite elevated coast of Africa, with the towns of Tangier and Ceuta clothing its heights, served to confirm the similarity of features with which every one whose travelled experience allowed of comparison was greatly impressed.

Hakodadi belongs to the imperial fief of Matsmai, and is the largest town on the island of Yesso, with the exception of Matsmai, from which it is distant about thirty miles in an easterly direction. An excellent road not far from the sea coast connects the two places, and a large trade is carried on between them and by both with several small towns on the island of Nippon, on the southern side of the strait of Saugar, or, as it should be properly called, Tsugara.

The town of Hakodadi is regularly built, with streets running at right angles with each other. They are between thirty and forty feet in width, and are carefully macadamized, to allow of the proper draining of water. There are open gutters on each side, which receive the drippings of the houses and the washings of the streets, and also well constructed sewers, through which the surplus water and the refuse are poured into the bay. The side walks, which are frequently paved, are curbed with stone planted on edge as with us, but as no wheeled carriages are found in the town the middle of the street is used indiscriminately in dry weather by the pedestrians.

Hakodadi, like all the Japanese towns, is remarkably clean, the streets being suitably constructed for draining, and kept, by constant sprinkling and sweeping, in a neat and healthful condition. Wooden picket fences with gates cross the streets at short intervals; these are opened for the passage of the people during the day, but closed at night. The same municipal regulations obtain in Hakodadi as in all the other towns in Japan; the inhabitants of the several streets form so many separate communities, as it were, responsible for the conduct of each other, each governed by an official called "Ottona," who is held responsible for the good order of the people under his especial charge, and these ottonas are also made responsible for the good conduct of each other. The gates and picket fences would seem to mark out the separate fields of duty of these officials.

At one side of the street, among the houses, there is ordinarily a

sentry-box for a watchman, whose duty it is to guard the town against disturbances, and give early notice of the occurrence of fire. A general quiet pervades the streets, without those ordinary signs of busy activity which belong to a trading city. No carriages, nor laden wagons, rumble along the road; no clamorous dealers claim the preference of the purchase of their wares; no busy pedlers or itinerant hucksters cry their articles for sale, and no turbulent mob disturbs the general peace and tranquillity. An almost perfect tranquillity prevails in the street, broken only at times by a stout horse-boy yelling to his obstinate beast of burden, either an unruly nag or lumbering ox, and an officious attendant of some great man shouting out to the people to prostrate themselves before his coming master, or perhaps the clanging of the hammer of a workman busy in some neighbouring forge.

Still the stranger is impressed with the idea that Hakodadi is a thriving town, when he beholds the occasional droves of laden packhorses slowly pacing through the streets, the hundreds of junks at anchor in the harbour, the numerous boats rapidly gliding across the bay, and the many richly dressed two sworded Japanese gentlemen and officials pompously stalking about or riding richly caparisoned horses.

The buildings in Hakodadi are mostly of one story, with attics of varying heights. The upper part occasionally forms a commodious apartment, but is ordinarily merely a dark cockloft for the storage of goods and lumber, or the lodging of servants. The height of the roof is seldom more than twenty-five feet from the ground. They slope down from the top, projecting with their eaves beyond the wall, are supported by joists and the beams, and are mostly covered with small wooden shingles of about the size of the hand. These shingles are fastened by means of pegs made of bamboo, or kept in their places by long strips of board, which have large rows of cobble stones put upon them to prevent their removal. The stones are, however, said to have the additional advantage of hastening the melting of the snow, which during the winter season is quite abundant in Hakodadi. The gable ends, as in Dutch houses, face towards the street, and the roofs projecting to some distance, serve as a cover and a shade to the doors. All the roofs of the houses in front are topped with what at first was supposed to be a curious chimney wrapped in straw, but which upon examination turned out to be a tub, protected by its straw envelope from the effects of the weather, and kept constantly filled with water to be sprinkled upon the shingled roof, in case of fire, by means of a broom, which is always deposited at hand, to be ready in an emergency. The people would seem to be very anxious on the score of fires, from the precautions taken against them. In addition to the tubs on the tops of the houses, there are wooden cisterns arranged along the streets, and engines kept in constant readiness. These latter have very much the general construction of our own, but are deficient in that important part of the apparatus, an air chamber, and consequently they throw the water, not with a continuous stream,

but in short quick jets. Fire alarms, made of a thick piece of plank, hung on posts at the corners of the streets, and protected by a small roofing, which are struck by the watchmen, in case of fire breaking out, showed the anxious fear of the inhabitants, and the charred timbers and ruins still remaining where a hundred houses had stood but a few months before, proved the necessity of the most careful precautions.

A few of the better houses and the temples are neatly roofed with brown earthen tiles, laid in gutter form. The poorer people are forced to content themselves with mere thatched hovels, the thatch of which is often overgrown with a fertile crop of vegetables and grass, the seeds of which have been deposited by vagrant crows. The walls of the buildings are generally constructed of pine boards fastened lengthwise, with a layer inside and out to the framework, which is jointed with admirable skill. The boards in front and rear are made to slide horizontally in grooves like shutters. At night they are barred fast, and in the day time entirely removed, to allow of the light to pass freely through the paper screen behind them. As in Simoda, the roofs project beyond the walls of the houses, and serve as a shelter in front for the display of goods, and in the rear for the carrying on of various domestic operations. The Japanese woodwork is never painted, although in the inside of the houses it is occasionally varnished or oiled; the buildings consequently have a mean and thriftless look. In the wintry moist climate of Hakodadi, the effect of weather upon the unpainted pine boards was strikingly apparent, causing them to contract, mould, and rot, so that the whole town had a more rusty ruined appearance than its age should indicate.

Previous to building a house the ground is beaten smooth, and the floor is raised about two feet above it, leaving a space in front and by one of the sides, which serves for a path to the rear, and a place to store heavy goods, as the roof projects over and protects it from the weather.

In the shops the whole front is often taken out to display their contents; but in the dwellings of the mechanics' establishments, there is usually a barred lattice of bamboo to hide the inmates from passing observation. Each house has a charm placed over the lintel or door-post, consisting of the picture of a god, a printed prayer, or a paper inscribed with some complicated characters, designed to protect the dwelling from fire or any other calamity.

The raised floor, which covers nearly the whole area of the house, is covered with white mats, made soft and thick by being lined at the bottom with straw. These are very neatly woven and bound with cloth, and are all of the uniform size prescribed by law, being three feet by six, and placed in rows upon the floor so neatly as to have the appearance of one piece. Upon these mats the people sit to take their meals, to sell their wares, to smoke their pipes, to converse with their friends, and lie down at night without undressing themselves to go to sleep, adding, however, a mat for a cover, and the equivocal comfort of a hard box for a pillow. The houses are generally lighted,

as has been frequently observed, with windows of oiled paper, though mica and slate are occasionally used instead.

The interior of the houses is plain and simple in arrangement, but always scrupulously neat and clean. There are in some of the better mansions occasional wood carvings of exquisite workmanship, though not very elaborate design. The paper windows and sliding screens which divide the apartments, are often adorned with paintings of landscapes and birds. In addition to the panels, the walls of the room are frequently hung with gaily painted paper, which, being arranged as rolling maps are with us, is moveable at pleasure. The stork or crane, a bird held sacred by the Japanese, and the winged tortoise and the porpoise or dolphin of the ancients, are favourite designs in all these decorations, whether of wood carving or painting, in the various buildings.

The furniture of a Japanese house is particularly meagre, consisting invariably of nothing but the floor-mats and the household utensils, which are few and simple. As squatting, not sitting, is almost the invariable practice, there seems no occasion for chairs, although they were sometimes found, and invariably supplied on state occasions. These are clumsy contrivances, with coarse leathern seats, and a framework like that of the common camp stool, which is easily folded up when not used. At the conferences with the authorities, the subordinate officers, both American and Japanese, were seated on sedans or benches covered with a red crape, while the Commodore and the highest native dignitaries were honoured with stools, which occasionally had the uncomfortable addition of arms and backs to them. The national posture of all classes, however, in Japan, when at rest, is crouching either upon the knees, or on the haunches with their legs crossed. The latter is common among the lower classes, and is pronounced decidedly vulgar by the fashionables, who invariably assume the former.

Tables are not generally used, but on the occasion of the public entertainments given to the American officers, the narrow crape covered benches were appropriated for the spread of the feast, the dishes being raised to the proper height for the guest by means of the ordinary lacquered stands of a foot in height and fourteen inches square. The Japanese eat from these raised trays while squatting upon their mats, and the unsocial practice thus obtains of each person taking his food by himself. Some lacquered cups, bowls, and porcelain vessels, the invariable chopsticks, and an occasional earthenware spoon, comprise the ordinary utensils used in eating. They drink their soups directly out of the bowl, as a hungry child might, after seizing with their chopsticks the pieces of fish which are generally floating in the liquid. Their tea-kettles, which are always at hand simmering over the fire in the kitchen, are made of bronze, silver, or of fire-proof earthenware. In the centre of the common sitting room there is a square hole built in with tiles and filled with sand, in which a charcoal fire is always kept burning, and suspended above is the tea-kettle supported by a tripod. There is thus constantly a supply of hot water for making

tea, which is invariably handed to the visitor on his arrival. The beverage is prepared as with us, but very weak. The cup is generally of porcelain, with a wooden lacquered cover. The tea is not ordinarily sweetened, though at Hakodadi sugar was often used. The better houses are warmed, but very imperfectly, by metal braziers placed on lacquered stands containing burning charcoal, which are moved readily from room to room as they may be required. In the cottages of the poor, there being but little ventilation from their contracted size, and no place of issue for the smoke, the burning charcoal in the fixed central fireplace becomes a great nuisance. In the more pretentious establishments, where there is plenty of space and holes in the roof or in the walls for the escape of smoke, while the charcoal is not brought in till perfectly ignited, this mode of heating the apartments is more endurable.

At Hakodadi the people seemed to suffer a great deal from the wintry weather; the poorer classes kept much within doors, huddled about their meagre fires in their hovels, which, without chimney, and with but a scant light from the paper windows, were exceedingly cold, gloomy, and comfortless. The richer people strove to make themselves more comfortable by enveloping their bodies in a succession of warm robes, but succeeded indifferently, as they were constantly complaining of the severity of the weather.

It is by the charcoal fires in the centre of the sitting apartment that the water for tea is boiled, the *sakè* heated, and sundry small dishes cooked; but in the largest establishments there is a kitchen besides, where the family cooking is got up. This is generally provided with a stove like an ordinary French cooking apparatus, in which wood is often burned, but this is an article they are very economical in using.

Connected with most of the dwellings in Hakodadi there is a yard, in which there are outhouses used for kitchens or stables. There is also frequently a garden where vegetables in small quantities are raised, flowers cultivated, and shade trees and ornamental shrubs planted. Some of the leading men of the place have handsome residences upon elevated situations, a little back of the town. Their houses are of the ordinary construction, but much larger in dimensions. The superior wealth and luxurious tastes of their proprietors are shown chiefly in the handsome gardens and pleasure grounds. These are tastefully planted with fruit and shade trees, and bounded with green hedges, while beds of variegated flowers contrast their bright hues with the green verdure of the foliage and the lawns of grass. There seems, in the high fences which guard from the eyes of the passer by, the sight of these luxurious delights, a desire for that privacy which betokens a love of retirement and a fastidious appreciation of the reserved comforts of home.

As in Simoda, there are large fire-proof warehouses, used for the storage of valuable goods. They are built with a great deal more care than the ordinary shops and other buildings, and have walls two feet thick, made of dried mud and cobbles, and faced with stone,

while their roofs are securely constructed of earthen tiles. These warehouses are generally two stories in height, the upper one having window shutters of wood sheathed with iron. Their exterior is sometimes covered with a coat of fine plaster, which, with their substantial structure, gives them a neatness and solidity of aspect which contrasts greatly with the flimsy stained look of the ordinary houses. They are probably depots for the storage of goods which belong to the Government, and are kept with great care and guarded watchfully.

The shops in Hakodadi generally contain such goods as are of a cheap sort, and adapted to the restricted wants of a poor population. The stock is made up of a miscellaneous assortment of coarse thick cottons, inferior silks, common earthen and China ware, lacquered bowls, cups, stands and chopsticks, cheap cutlery, and ready-made clothing. Furs, leather, felted cloths, glass ware, or copper articles, are rarely seen; nor are books and stationary very common. The provision shops contain rice, wheat, barley, pulse, dried fish, seaweed, salt, sugar, saki, soy, charcoal, sweet potatoes, flour, and other less necessary articles, and all apparently in abundant quantities. There is one public market in the town, as neither beef, pork, nor mutton are eaten, and very little poultry. Vegetables, and a preparation made of beans and rice-flour, which has the consistency and appearance of cheese, are hawked about the streets, and form a considerable portion of the diet of the people. The signs of the shops, in accordance with the general practice in Japan, are inscribed on the paper windows and doors, in various well known devices and cyphers, either in Chinese or Japanese characters. The shopmen were at first very shy, and showed but little disposition to sell their goods to the Americans; but when they became somewhat more familiar with the strangers, the characteristic eagerness of tradesmen developed itself to the full, and the Hakodadi merchants showed themselves as clever at their business as any Chatham Street or Bowery salesman with us. They bustled about the raised platform on which they were perched, pulled out the drawers arranged on the walls, and displayed their goods to the greatest advantage when they thought there was any chance of catching the eye and pleasing the taste of a passing American. They were always very jealous, however, of their prerogatives, and were exceeding annoyed if any of their purchasers stepped upon the platform, which was their trading sanctum, and as carefully guarded against intrusion as the "behind the counter" of a New York shopman. The purchaser ordinarily stood under the roof, on the ground, in the space which intervened between the side walk and the elevated shop-floor. Some of the more impatient and intrusive Yankees, however, would occasionally spring up, and pulling out the goods, handle them very unceremoniously, not, however, without a serious protest on the part of the sellers, who sometimes were so annoyed that official complaints were made by them to the authorities. The shopkeepers had always a fixed price for their goods, and all attempts to beat them down were useless, and generally rebuked by an expression of displeasure.—*Commodore Perry's Voyage.*

The Nicobar and Andaman Islands.

The Gulf of Bengal contains two groups of islands, which, in a scientific point of view deserve particular attention; one of which is the Nicobar Group, situated about 120 nautical miles from Sumatra, and the other the Andaman Group, about the same distance from the former. The precise time of their discovery and their history is not known, but it is known that one of the principal sovereigns and founders of the kingdom of Acheen—the celebrated Segaou, who flourished there about the end of the sixteenth century—was born in the isle Kamorta, belonging to the first of these groups.

The Danes, from 1754 to 1785, formed various establishments on the Nicobar Isles, and this circumstance gave them, about the end of the eighteenth century, the name of Fredericksoerne, or the Islands of Frederick, in memory of the Prince who reigned in Denmark at the time of these first expeditions. Since then, the places first occupied by the Danes have been abandoned, and no other remains at present but at the Isle Kamorta and in the port of Nancowry. These last establishments, which only date from 1832, are placed under the command of the Governor of Tranquibar. The garrison of these places is composed entirely of Sepoys, the severity of the climate rendering it unfit for Europeans.

The Moravian Brethren dwelt on these islands under the authority of King Frederic VI., but abandoned them thirty years afterwards. The Austrians, who one is surprised to find in these distant countries, formed an establishment at Kamorta in 1778; but some years afterwards abandoned it on the representations of Denmark.

The principal isles of the group are the Great Nicobar, the population of which is about 1,500; Little Nicobar, which is covered with fine timber; Katchoul; Kamorta; Nonkavery; Triconta; Teressa; Tchaouri; Tafouin; Kar-Nicobar or Sambelong; Chowry; Battymalbe; and Tillantchong. It was on Kar-Nicobar, the northernmost of the group, that the first Danish establishment was made in 1756.

The islands of this group produce a large quantity of sugar-cane, arrack, cocoa-nuts, laurels, and excellent teak wood, as well as very aromatic sassafras. They produce also a tree, called by the Portuguese *mellorè*, and by the natives *larum*, which yields a fruit better and more advantageous than the bread-fruit of Tahiti. Towards the end of the last century cattle were introduced into the islands, and have increased immensely. The edible bird's-nests, superior to those of China, are one of the principal productions of the islands.

The inhabitants of the group are copper-coloured. They have small eyes, obliquely set, and bear a strong resemblance to the Malays. They are good tempered, peaceable, and hospitable. They have an idea of a Deity, to which they give the name of Kouallen, and which they worship under the form of certain trees and plants. Each town is headed by a Chief, who, amongst other duties, directs the commercial intercourse with strangers.

The inhabitants of the Nicobar Islands have a little woollen band in their dress, tapered to a point, hanging behind them, an ornament of which they are very proud. But this peculiarity has given rise to the long established belief that they had natural tails like those of quadrupeds. This curious opinion has been entertained by a great number of *savans* and travellers, and in the present day is not yet entirely removed, notwithstanding the actual proof by which it might be so easily controverted.

The Andaman Group, which also bears the name of the Endamenes, was known to the Arabs of the ninth century, and contains more important islands than the other. The six principal islands of the group are the Great and Little Andaman; Barren; Narcondam; Preparis; and Cocos. The Great Andaman is 200 kil. long, and in its widest part 28 kil. across, and the coast of which presents magnificent bays and natural harbours. The soil is fertile, and in its mountainous part abounds in metals and especially mercury, only obtained of late years. Its highest mountain is 1,600 yards above the sea, and, being visible at a great distance, serves for making the island. From one of its highest peaks a spring flows plentifully down its side, forming one of the principal rivers of the country, a condition which altogether forms a curious and very rare phenomenon. The island is besides covered with rich forests, producing the most precious scented wood; but, unhappily, it is infested with numerous reptiles, in compensation for which the sea around it abounds in excellent fish.

The people of this group bear no resemblance to those of the Nicobar Isles. They have woolly hair, and in form of figure and character bear much resemblance to the Negro race. They lead a wild life, and have resisted every attempt made to spread among them the benefits of civilization. In the northernmost of the isles of this group is Cornwallis Harbour, where the English, in 1793, constructed a fort, which they afterwards abandoned; and in another island is Chatham Harbour, where the English, in 1791, founded a colony, which they afterwards abandoned for Cornwallis Harbour, abovementioned.

Barren Island contains a celebrated volcano with several craters, which frequently discharge torrents of lava and project enormous stones to a great distance. In the middle of this island is a circular basin, filled by sea water, in which there is a peak 640 yards high. This peak contains the craters of a volcano at its summit, and in the month of March, while great eruptions are going forward, the water boils round it as if it was in consequence of a considerable subterranean fire. These volcanic phenomena, which astonish navigators, are not to be found in any other part of the globe.—*Moniteur de la Flotte.*

[The reported banishment of the Ex-King of Delhi to these latter islands will invest them with some slight interest.—Ed.]

THE RED COLOURING MATTER OF THE SEA ON THE SHORES OF THE ISLAND OF BOMBAY,—*By H. J. Carter, Esq., H.C.S., Bombay.*

From "the plagues of Egypt" down to the present day the blood-red colour which occasionally makes its appearance in fresh and salt water has been an object of wonder. Numbers of instances of it are recorded by navigators of all ages, as may be seen by reference to M. C. Dareste's excellent *Memoire* on the subject, (*Ann. des Sc. Nat.*, 4th ser., Zool., t. iii., p. 179.) Besides red, spots of white, yellow, green, and brown water have been seen in different parts of the globe, but those of red and white are most common in the Arabian and Red Seas, and of these two the red will chiefly occupy us here. They are of transitory duration, and so far as the latter or red colour is concerned, receive explanation from what occurs at our own doors, viz., in the sea-water pools left by the reflux of the tide on the shores of the Island of Bombay. A person casually looking at one of these pools would say that a quantity of vermillion had been thrown into it, but on examining the water under a microscope the colour is seen to be owing to the presence of red animalcules whose name is *Peridinium*. These are not all red, however, for there are many green ones among them, and the former are further observed to be but a transitional state of the latter. This, then, is the cause of the red colour, and its sudden appearance and disappearance may be explained as follows:—

During the first or active part of the *Peridinium's* life, its green colour, which depends upon the presence of a substance closely allied to, if not identical with, the chlorophyll of plants, is, with the other internal contents, translucent, and therefore reflects little or no light; but gradually, as the time approaches for its transition to another state, called the motionless, fixed, or protococcus form, a number of semi-translucent, refractive oil-globules are secreted in its interior direct or through transition from starch; the green colour disappears, a bright red takes its place; this mixes with the oil, and thus the little animalcule finally becomes visible to the naked eye, and the whole of that portion of the sea charged with them of course of a deep vermillion colour. This colour, however, only lasts for a few days, for they soon assemble together, become individually capsuled, and in this state sink to the bottom in the motionless or protococcus form mentioned. Here duplicative subdivision takes place in several of the capsules, producing two or four new ones from the old *Peridinium*, each of which, on their liberation, may again become capsuled and undergo a further division, and so on probably until their formative force is expended, and they thus pass into dissolution; or a litter of diplo-ciliated monads may be developed in their interior, which may be the product of a true act of generation, or the final effort to form of the protoplasm, to which I have already called attention in many of the *Algæ* and *Infusoriæ;* while the remainder of the red oil which is not required for the nourishment of the monads becomes liberated with the

latter on the bursting of the capsule and thus dispersed in the water. A further consequence of the fissiparation is the constant shedding of their capsules, which are always present with them in great numbers, and so brittle that pressure of the thinnest piece of glass bursts them, and again sets free the *Peridinium* when they contain one.

Thus we see that the red colour is produced by the formation of oil reddened at the expense of the green chlorophyll. The same process takes place in the little *Protococcus*, which I have heretofore shown to impart the red colour to the salt in the salt-pans of Bombay; and again in a fresh-water animalcule closely allied to *Peridinium*, viz., *Euglena viridis;* while a more familiar illustration than any is presented to us by the red colour which the leaves of some trees assume towards death, viz., the passing of the green chlorophyll and oil into a yellow, brown, and then red, waxy substance, from whence we may also infer that like changes in the *Peridinium* give rise to the prevalence of one or other of these tints in the coloration of the sea.

The species of *Peridinium* now more particularly under our consideration I described several years since in its fixed form (as it was submitted to me) undergoing fissiparation (see Dr. Buist's paper on "Discolorations of the Sea, &c.," *Proceedings of the Bombay Geographical Society*, 1855, p. 109,) but never having met with it again in its active state until the 26th November last, my attention was not again drawn to the subject, nor did I until then know what the animalcule really was. I shall call it animalcule, though, like *Euglena* and all this class, it really belongs much more to the vegetable than the animal kingdom: and, believing the species to have hitherto been unrecognised, its description under the designation of "*Sanguineum*" may stand as follows:—

Peridinium Sanguineum (nov. sp.)—Subcircular when green, becoming larger and paraboloidal or kite-shaped when red. Compressed, sulcated on one side; surrounded transversely by a deep groove, the lower lip of which is minutely ciliated. Furnished with a long, large cilium, having a suctorial extremity, which extends backward from the groove on the sulcated side. Body lined with granular protoplasm and chlorophyll, in which is a hyaline vesicle with red eye-spot and nucleus as in *Euglena*. Chlorophyll becoming of a golden yellow then brownish, and lastly vermillion red, as the animalcule passes into the protococcus state. Progression, waddling, the small end forwards and the large cilium floating behind. Length, 5 to 8-5600ths of an inch. Found in salt-water pools, and in the sea on the shores of the island of Bombay.

What then accounts for the red colour of the sea? Water and salt in the salt-pans at Bombay may account for the red colour in the sea-water of other parts, although the animalcules may not be the same, viz., the formation of red oil in their interior. It is interesting, however, to find Darwin's description of the animalcule which he found to colour the sea red a degree South of Valparaiso (his *Journal on board H.M.S. Beagle*, p. 17) accords exactly with that of *Peridinium*, as may be seen by comparing our descriptions; while it is not less so to

find Salt (*Voyage to Abyssinia*, p. 195) stating that the animalcules which produced the red colour in the Red Sea (15° N.) during the day, became luminous and threw out sparks by agitation after dark; because most of Ehrenberg's marine *Peridinea* are phosphorescent. In further confirmation of which Olafsen and Povelsen's statement may be adduced respecting the red colour of the sea on the shores of Iceland, viz., that in 1649, in several gulfs "the night before, the sea appeared all on fire, and the day following as red as blood." But it is not necessary for me to cite here all the observations in M. Dareste's *Memoire* in favour of the red colour of the sea being in many instances owing to the presence of *Peridinæa*, or the white colour, to the same animalcules. Suffice it to state that there are many.

With the explanation of the red colour then we have that of the white, which is only seen at night, and appears to be produced by phosphorescence generated in the midst of the oil-globules, becoming less and less powerful, probably as the *Peridinium* becomes redder and more nearly approaches to the fixed or protococcus form. I do not of course allude here to the colour of what is termed "whale-water" or to the accumulation of any molluscous animals that can be seen with the naked eye, but exclusively to the colour of water produced by animalcules, which also must again be distinguished from those that are feeding on them, for where the former abounds the latter are also sure to be present.—Here I have to express my regret that I allowed the red-water under consideration to pass away before I thought of ascertaining if the *Peridinium* which coloured it was also phosphorescent.

Again, the yellow colour may be produced by the chlorophyll passing into a golden tint, when the oily appearance so often noticed on the surface of the sea might be produced; so also the green colour may precede the change into brown and red, as stated in parts of the *Memoire* under reference, extracted from Parry and Scoresby's journals. Scoresby, too, notices that the animalcule was "paraboloidal," and he gives measurements equally small with those of a *Peridinium*.

Of the brown colour a word also is necessary. This, which probably depends on the presence of a *Peridinium* in the sea, certainly does so on land, for I have had ocular demonstration of it in a fresh-water tank at Bombay, where, in the beginning of February, 1857, it not only turned the water quite brown, but imparted a smell and insipid taste to it, which almost rendered it undrinkable. Professor Allman has described the same phenomenon, from equal evidence, in the ponds of the Phœnix Park, Dublin, (*Trans. Microscop. Soc., Lond.*, v. iii., 1855); but the figure he gives of that *Peridinium*, though very like, is not the same as that of the species of Bombay.

Nor should I omit to notice here the æruginous green colour, which frequently occurs in our tanks from the presence chiefly of a little *Algæ* called *Flos-aquæ*, with which the acicular, fusiform *Aphanizomenon Flos-aquæ*, (Linn.) and curled up, bead-like *Monormia intricata* (Berk.) are plentifully mingled. This occurs so generally and so abundant, as frequently to render the water not only undrinkable, but to produce an intolerable stench through its putrefaction; facts which

we cannot help associating with the blood-red water of Egypt. And when we add to this the following passage from an eye-witness of a similar occurrence at Porebunder on the coast of Khattywar, where red water is extremely common, viz., the colour of the sea-water on Saturday evening last, the 27th October (1849), was changed from its usual tint to a deep red, emitting a most foul smell; the fish speedily were all destroyed, and were washed upon the beach in large quantities, &c., &c., *(Proceedings Bombay Geograph. Soc., lot. cit.)* We cannot help ascribing this, independently of the conjecture of the narrator that it might be owing to some submarine eruption of mud, &c., to the process of oleaginous development and change of colour above-mentioned in some animalcule, most probably *Peridinium;* and of realizing at the same time the (to me) previously incomprehensible Mosaic account of the plague of Egypt, given in the following verses:—

"And all the waters that *were* in the river were turned to blood.

"And the fish that *was* in the river died; and the river stank, and the Egyptians could not drink of the water of the river; and there was blood throughout all the land of Egypt."—Exodus vii., 20, 21.

Spontaneous Combustion of Coals at Sea.

We reprint from the *Straits Times* of September 22nd the account of the loss of a new ship, the *Kandian Chief*, by the spontaneous combustion of her coal,—another proof, if any more could be needed, of the necessity of adopting some plan to obtain timely warning of this danger, which, dreadful as it is, there is reason to believe always takes *time* to come to a head, as it certainly did in the instance we now publish, and as it has done in all the cases of which we have any notice. The shortest interval quoted by Mr. Piddington in his pamphlet, reprinted in *Nautical Magazine* for 1847, being a week after the shipment of the coals; so that by this peculiarity, formidable as the danger is, it may really in most cases be easily averted.

In the case of the *Kandian Chief* it will be seen by the statement of the Captain of the unfortunate vessel that he had perceived *a gas or steam* issuing from the coal for about a fortnight! "but the weather being at the time damp and foggy, thought it was occasioned by the coals steaming, so did not mention it in the log-book, having observed the same on former voyages!" If we had read this of a Turkish ship or steamer, we should have exclaimed at once,—"Look at this stolid fatalist of a Turk, who allows his coal to heat and steam for a fortnight under his nose, and is too ignorant to understand that coal has no business to be emitting steam and gas, and in fact cannot do so without mischief being on foot amongst it! Doubtless he made up his mind that if it was the will of God that the ship was to be

burnt she certainly would be so; and so, passing the Cape of Good Hope at his ease, he went on some twelve or fourteen degrees beyond it, as if to give Providence fair play by getting as far from help as possible; and there his coals first begin to suffocate him and his crew, and then are found to be on fire, and he is only saved by his mere chance meeting with a Dutch ship, and getting on board of her before the gale became too violent!" Why our English Captain did not dig down into his coal, or drive in a crow-bar at the end of a small spar even, or haul up for the Cape, which he must have passed within four or five degrees of distance to examine his cargo no doubt he would explain by his excuse that "this had occurred on former voyages."

He complains of having lost a nice ship. We really cannot pity men who, with the lives and property of others under their charge, are so ignorant or so wilful and wrong-headed, and so devoid of all common care, as his own statement shows him to have been. Taking the ship and cargo to have been insured, she was probably worth at least from £10,000 to £15,000, and with a few of the iron pipes proposed to act as water calorimeters, all this loss and risk of life might have been saved. Do the underwriters at Lloyds find any particular gratification, we wonder, in paying for losses like these? or are they, too, fatalists enough to act on the Turkish principle of leaving all things to the will of God, and so holding it an impiety to take any precautions against the loss of their money?

We subjoin details of the loss of the new ship *Kandian Chief*, destroyed at sea in consequence of the spontaneous combustion of her cargo of coals. The crew were fortunately saved by a Dutch vessel bound to Batavia:—

With feelings of deep-felt regret I inform you of the total loss of the *Kandian Chief*. I sailed from Gravesend on the 4th May, 1857, —cargo consisting of 615 tons of coals,—bound to Galle. Everything seemed to go on very prosperously; a fair wind down Channel. I crossed the equator the thirty-sixth day, rather longer than usual, having had ten days light airs and calm, averaging one knot per hour.

Nothing particular happened until the 18th July, being then in lat. 38° 4′ S., long. 31° E. On opening the after-hatch perceived a gas or steam issuing from the coals, but did not consider it dangerous, as we had observed the same about a fortnight, but the weather at the time being damp and foggy, thought it was occasioned by the coals steaming, so did not mention it in the log-book, having observed the same on former voyages. At midnight it came on to blow a storm at S.b.W.; scudded for safety with close-reefed main-topsail, steering E.N.E., a very high cross sea, ship labouring and straining heavily, and shipping a deal of water.

Sunday, 19th.—Ditto gale and sea; a smell of gas in the half-deck and cabin, so very offensive that all hands complained of sore throats and head-aches. Fearing the coals would ignite momentarily, got all ready to get boats out, that is with carpenter's tools, for it would have

been impossible to hoist them out, ship having too much motion, our only way would have been to cut the bulwarks and launch them over. At 8h. a.m. heavy storm with a tremendous high sea. Opened the hatches to examine the coals; found them steaming much, and very hot, with a kind of smoke evaporating through. Poured a great deal of water where the smoke came from, but saw it was useless, all the heat being in the after-hold fore-part of the hatch, none whatever in the fore-hold. Battened down the hatches firmly, no person enabled to stop below. Wind and sea much the same.

Monday, 20th.—At daylight rather less wind; set double-reefed fore-topsail, let one reef out main one; still steering E.N.E.; heat below increasing. At 9h. a.m. saw a ship to leeward, the first we had seen for the last twenty-nine days, kept away two points to speak to her. She proved to be the Dutch bark *Souburg*, from Amsterdam, bound to Batavia. Informed him by signal that I feared my cargo would take fire; asked him if he could keep company. He immediately answered he would render every assistance. Noon, fresh gale and squally; *Souburg* under our lee. I then gave him instructions how to act during the night in case the coals should blaze up. But at 3h. p.m., wind and sea again increasing, concluded it was not prudent to remain on board during the night, there being no moon, and the night dark and long. Hoisted ensign in distress; laid too, head W.S.W.; with great difficulty succeeded in getting the yawl out, and sent as many as she could conveniently carry on board the *Souburg*. Returned again about 4h. p.m., and sent another lot, but the sea was so furious the boat was half full of water, and all but capsized two or three times. At 5h. 20m. took off the remainder, viz., sixteen hands. Hoisted the boat on board the *Souburg*. The Captain and all hands, welcoming us on board with dry clothes, &c., promised to stay by the *Kandian Chief* till daylight.

Tuesday, 21st.—At 7h. a.m., daylight, *Kandian Chief* about nine miles off; made sail towards her. At 8h., drawing near, observed much steam and smoke coming out of booby-hatch and companion; wind decreasing with a tumbling swell, made no progress to windward towards the ship. Noon, light winds and close cloudy weather, tacking to windward towards *Kandian Chief*. At 3h. p.m., wind dying away, got the boat out; sent the mate, carpenter, and three more hands to go and endeavour to get some provisions previous to the coals igniting, ship being then full seven miles to windward. At sunset calm and dark cloudy weather; *Souburg* with two lights up and a blue-light every hour. At 8h. p.m. observed a large fire proceeding from the direction of the ship, supposed the coals to have ignited. At 9h. the boat came alongside; hoisted her on deck. A very large fire on board *Kandian Chief*, mate and carpenter reporting that in getting alongside of her it was with difficulty they could get aft, the deck being very hot, no heat in the fore-hatch, ventured down the cabin, but could not remain there one minute; opened the after-hatch, and there saw the coals on fire; were compelled immediately to leave her without saving a single biscuit or anything eatable; a few clothes

were taken out of the forecastle, but nothing in the shape of stores or provisions. Midnight, *Kandian Chief* S.S.W., distant nine or ten miles, and burning tremendously, only foremast standing. Calm and dark cloudy weather.

Wednesday, 22nd.—At 6h. a.m. *Kandian Chief* still burning fiercely, distant fifteen miles; after that nothing discernible but smoke. At thirty minutes past noon saw an immense volume of smoke, then ceased altogether, supposed the ship to have burnt to the water's edge, then to the bottom, and there ends the career of the clipper ship *Kandian Chief.*

I feel thankful to that over-ruling Providence that sent us this peculiar ship to save our lives; the nearest land was about 350 miles off (S.E. coast of Africa),—what are open boats in such stormy sea and winter time?

I am bereaved of a nice ship, I feel it deeply.

WILLIAM DAVID.

We print below a very interesting and instructive account of the spontaneous combustion of a cargo of coals on board the ship *Zetus*, with which we have been favoured by Captain Sparke of the ship *Carntyne*, who was then chief officer of her. Of the interest of the narrative, no one who reads it will doubt, we think; and its instruction consists, first, in the full confirmation of what the chemists have been telling the owners, underwriters, and sailors so long, of the danger of shipping bright pyritous coal. Possibly the very next heap to the one from which this coal was taken was good coal, free from pyrites; but then the steamers at home often object to pyritous coal because it destroys the bottoms of the boilers so rapidly, and so it was pushed off on the poor sailors. Then we have the fact that the coals were *steaming* for a considerable time, which is easily explained on chemical principles and is not to be attributed to the coal being wet enough to afford so much steam, but to the evolution of hydrogen gas, which, combining with the oxygen of the air, forms water, which first appears like vapour from its high temperature; but sailors, generally, not being aware of this, neglect the timely warning, supposing coal to be, like other cargoes, liable to *heat*, and that the steam is merely the water amongst it, and nothing more. The explosion described by Captain Sparke has frequently occurred, but this is the first instance, we think, in which it has been one of gas in a state of inflammation; and this accident, again, while it may account for the loss of some of the crews of the coal ships, by preventing them from taking to or provisioning their boats when the whole ship was on fire above and below, warns them, in cases where hatches may be battened down, to keep the lower sails clewed up, to guard against a burst of fire.

We must not conclude these remarks without adverting also to the capital management of the vessel under these appalling circumstances, to which we can scarcely suggest any other addition than that, instead of battening the hatches down altogether,—of which the effect, no

doubt, was to keep the gases under strong pressure, and *perhaps* (for we write doubtingly of a doubtful and obscure chemical question) thereby to accelerate their inflammation,—it might have been better, after battening them down securely, to have cut a small circular hole of a foot or fifteen inches in diameter in one of the hatches, and then nailed down to it the foot of a wind sail, hoisting the yard to the stay, and being careful to keep it wetted, lest the heat of the gases should burn it. This might be done at the fore and main hatchways, and even if it were assumed that the fire would break out somewhat sooner, that would be preferable to an explosion, of which no one can calculate the strength or the mischief.

It is difficult to say if anything could have been done safely when the coals began to steam, though this was indubitably an indication of chemical action going on. Perhaps the coals should in such a case be dug into, if possible, to see if they have heated; and if so, they should be, if possible, *flooded* (not merely wetted) by pumping or hoisting in water, and this water, when pumped up, should again be sent down upon them, till in a day or two all the steaming would cease; and this is what is evidently contemplated in Mr. Piddington's plan for obtaining warning and extinguishing spontaneous combustions. We have said above that the coals should be dug into *if possible*, and this because the gas may be of so deadly a nature, that it might be impossible to work upon the coals. The following is Captain Sparke's narrative:—

The ship *Zetus*, of 900 tons register, left London in November, 1851, with about 800 tons of Newcastle coal for Bombay; they were taken in from lighters in the London Docks. The coal was very strongly marked with golden and other coloured veins; there was placed, for ventilation, in each hatchway a square wooden funnel *latticed* on two sides, which reached from the keelson to the top of the coal in each hatch. Several hundred plates of spelter were afterwards taken on board, and placed on the coal between the fore and after-hatches, thus forming a level for Manchester bale goods, crates of glass, and other light cargo.

Nothing particular was noticed about the cargo till after rounding the Cape, when we frequently noticed the hold to steam very much, and when the fore or after-hatches were taken off for stores or water the deck beams and hatches were found dropping with moisture; we therefore often kept them off in fine weather, but did not apprehend danger.

When we had arrived to about 500 miles S.S.E. of Ceylon, in February, 1852, an alarm was given one morning by the cook, who had been below, that the hold was full of smoke. A search was therefore made as to the place from whence it was coming, but as nothing could be found in the fore or after-holds, the main hatches were unbattened, and on several cases and packages being taken up, a gas-like sort of smoke was seen issuing from the main body of the coals. We dug into them for some time, but found it rapidly increasing, and the

coals becoming very hot. After a short consultation, the captain deemed it advisable to caulk all hatches down and close every ingress for air, thereby thinking to smother it. The ship was steered a direct course for Point de Galle, and all the boats got ready, with water and stores in them.

The next day the smoke began to force itself out of the seams in the stern frame and inner lining of poop and forecastle; and about 11h. 30m. a.m., the hatches were all blown off with a tremendous explosion, the mainsail split to pieces, the galley lifted up, and a sheet of blue flame ran along the ship, scorching the hair and whiskers of one or two persons who were in the cabin below! Great quantities of the most choking smoke and gas now poured up the hatches, so that we could scarcely bear it. The ship was hove to, the boats got out, and every preparation for leaving the ship (if necessary) completed. The forehold being by this time partially clear of smoke (by the ship having been brought to the wind), the carpenter got below, and bored several holes out through the lower air holes below water, whilst long pointed plugs were made to secure them again. We then threw overboard several hundred plates of spelter, to lighten the ship for the admission of water, and when there was about twelve feet in her, plugged up the holes, and, setting on both main pumps, continued to pump up and, with hoses, pour down the water upon the coals, thereby completely flooding them. In about two hours the smoke began to lessen and gradually turn to steam, but we continued all night pumping on it, and by next morning it was completely extinguished.

We reached Point de Galle three days after with eight feet water in the hold, and there discharged about 500 tons from the main body, which we found had in some places been quite reduced to coke, and even then such a noxious, sulphureous vapour arose from it that the crew could only work at it for short spells of ten minutes. We also found that all the wrappers of the bales were singed, and the straw in the crates quite burnt. The coal we landed was dried, and part of it re-shipped, and in six days the ship proceeded on her voyage to Bombay, and without further trouble arrived there on 21st March, 1852.

Calcutta Englishman.

The Indian Ocean considered with Reference to the Wants of Seamen.

(Continued from p. 161.)

Pitt Channel, which leads, as already observed, into the Pacific Ocean, by either Gilolo or Dampier Channel, is preferable to the Strait of Macassar during December, January, and February. A vessel, at this season, arriving from the Strait of Sunda, on her way from Bengal, or at the Eastern Straits, on her way from the Cape of Good

Hope, would adopt this channel when bound to China; this it is that forms the second eastern route.

When a ship, as it frequently happens, from the Gulf of Bengal takes the Strait of Sunda instead of passing along the South coast of Java, on entering the Java Sea she should pass North of the Thousand Isles, and then steer eastward, leaving the Isle of Watcher to the North, on her way to the Strait of Salayer. In case of touching at Batavia: on leaving this port, after having passed Edam Island, she would steer so as to leave Burakin Island to the northward, and, having passed it, she would steer for Salayer Strait. The best course through this strait wtih a N.W. wind is to pass South of Mansfield Bank. At night, or when the wind is not steady, it is better to keep to the northward of it, along the coast of Celebes. From the Strait of Salayer she would make for Boutou Strait, or, what would be still better, if the wind is West, she would pass South of this island, keeping the S.E. point well on board, with the view of avoiding the rocks off it to the southward of the islands of Toukau-Bessy. She would then pass along the eastern coast of Boutou Island, and, having reached the N.E. end of it, if the wind is fresh from N.W., she would make to the northward for the island of Waigiou, and from thence for the island of Kulla-Bessey. This is a necessary precaution for dull sailing vessels in December, and the beginning of January, because the wind becomes variable about this period, and veers to N.N.W., producing a strong southerly current. The winds and currents are, however, very variable in Pitt Channel, and it may be crossed almost anywhere. It is prudent, however, to keep the weather shore on board when northerly winds prevail.

A vessel falling to leeward of the N.W. point of the island of Bouro should make every exertion to pass it quickly. To do this, instead of working to windward, it is better to run to southward of the island and pass to the eastward of it into Pitt Strait. Vessels which leave Amboyna in the N.W. monsoon make to the Northward along the East coast of Boero, where the wind is variable and off the land; while beyond Manipa and in the channel which separates it from Ceram, in this season southerly currents prevail. A vessel having reached Pitt Passage by the foregoing routes will be guided by the directions hereafter given.

A vessel intending to use Pitt Passage should take either the Strait of Bally, Lombock, Allass, or Sapy, and on leaving either of these straits would make for that of Salayer, crossing the eastern part of the Java Sea, and afterwards steer for Pitt Channel. For a vessel from the Cape, the Strait of Ombay is preferred, as being the most direct and larger than those further West, and the wind there being generally less variable.

A vessel making for Ombay Strait must pass either North or South of Sandal-Wood (Sumbewa) Island; but it is better to pass South of it and then between Ombay and Trinor, and, having rounded the eastern end of the former, she would then steer North, keeping to wind-

ward, so as to pass West of Boero Island. If this cannot be done, she would pass East of this island, between it and Manipa, and then take Pitt Channel. Having entered Pitt Channel, she would then steer East, passing between Kulla-Bessey and Boero; and from thence, if no current be found, she would steer direct through Pitt Strait. If the current sets northward, she would keep from the islands bounding the northern side of the strait.

When near the meridian of the East point of Oby Major, and intending to take Dampier Strait, a vessel should continue to run eastward. This strait seems favourable for good sailing vessels, especially in January and February, when N.E. winds are getting more easterly. In March, when the N.E. winds become weak, the Straits of Gilolo appear the best for entering the Pacific Ocean. This latter is also wider, and a ship may work both night and day in it, and, besides, the currents there are seldom strong. On leaving Pitt and Dampier Straits great caution should be used to prevent being set on the North coast of New Guinea, and a vessel should therefore manage so as to round Point Pigot close, looking out at the same time for Buccleugh Bank, to the East of the eastern coast of Waigiou.

Pitt Strait.—Pitt Strait should only be adopted when it is compulsory to do so. In this case a vessel should keep mid-channel, to avoid being drawn to either shore by the tides, and should therefore make short boards, not approaching either shore. On reaching Jackson Island, she would pass about five miles North of it; and, having passed the reef off the extreme of the Island of Batenta, she would steer North for Point Pigot. Horsburgh advises ships to avoid this strait by all means.

Dampier Strait.—A vessel entering Dampier Strait, on passing the meridian of the East point of Obi-Major should steer East, and go between Pulo Popo and the Kanary Isles. Sometimes vessels pass between the Boo Islands and Pulo Popo; this is an advantageous route in N.W. winds. She would then run on for Fisher Island or Cape Mabo, and from thence pass betwen Pigeon and Foul Islands, looking well out for the dangers on the North shore of Dampier Strait; and on leaving it she would keep closer to Pigeon than to Foul Island, and she would steer so as to sight Pigot Point, in order not to be set down to the coast of New Guinea by the northerly swell which prevails out at sea. She would also take care to avoid the Buccleugh Bank.

The tides in Dampier Strait are very strong and the currents very irregular, varying at a rate from one to five miles an hour. In the height of the N.W. monsoon, in the narrow part of the strait, between Pigeon and Foul Islands, the ebb at the time of syzygy runs between four and five miles to the E.N.E. for six or eight hours, and between one and three miles in neaps. The flood sets S.W. for three or four hours, but is weak. During the height of the S.E. monsoon, in this part the flood sets West for eight or ten consecutive hours, turning successively W.S.W., S.W., and S.W.b.S.: it then attains its

greatest velocity, which at springs sometimes exceeds five miles an hour, and at neaps four miles. The ebb at this season runs E.N.E. or N.E., and is neither strong nor of long duration.

A vessel, on leaving Dampier Strait, having entered the Pacific Ocean, should make easting rapidly, keeping in a low latitude, or between the parallels of 1° 30′ and 3° N. lat., which she will do easily, sometimes, even, in December and January. In this zone an easterly current is found, which will be treated on in considering the winds of the Pacific Ocean. She will thus make good her easting as conveniently to pass either East or West of the Pelew Islands, which will depend on the qualities of the vessel and the strength of the N.E. monsoon. In all cases she would not go far East, on account of the Islands of Goulou and Guap, near which, in November and December, heavy squalls from the westward are met. From the Pelew Islands she would steer for the Bashee Islands, allowing for the westerly currents, which set about twelve or fifteen miles a day. From December to the middle of February it would be best to pass East of the Pelew Islands.

A vessel leaving Dampier Strait towards the end of the N.E. monsoon would not go so far East into the Pacific. At the end of February and March she would pass West of the Pelew Islands, as the winds in these months are variable and shift to E.N.E. When she has reached the North part of Lucou she would enter the China Sea by either of the great routes between Formosa and Lucou. However, with N.E. winds and at the beginning of the monsoon, it will be necessary to pass North of the Bashee Islands, and either North or South of the Cumbrian Rock. She will thus approach the South point of Formosa, and must pass, if during the daytime and the weather is fine, between this point and the Vele-Kete Rock. During the night, or should bad weather prevent her taking this route, she would pass North of the Bashee Islands, keeping close to them.

Whichever may be the channel by which the China Sea is entered, a course should be adopted to sight, if possible, Pedro Blanco, and enter the Canton River by the Lema Channel.

It now remains to treat of the Strait of Gilolo, the third of those leading from Pitt Channel to the Pacific Ocean.

Strait of Gilolo.—The Strait of Gilolo is divided into two parts by Geby Island, and the channel between this island and Gilolo takes the name of Gilolo Strait. That between Geby and Waigiou has been called the Strait of Bougainville, that officer having passed through it in 1772.

All the channels leading from Pitt Passage to the Strait of Gilolo are free from danger. In the N.W. monsoon, however, that between Pulo Gass and Kakik Island is preferred, as being the largest, for the other, between Pulo Pisang and the Boo Isles, is at this season too much to leeward. A vessel entering Gilolo Strait, passing, as above said, between Pulo Gass and Kakik, should round the southern point of the first of these islands closely, in order that she may not miss the channel by the drift of the easterly current, which often prevails there.

When she has passed East or West of Pulo Gass, according to the channel taken, she should continue on between Tabo Cape and Geby Island, and, if during the night, should give the Fairway Bank and Widda Islands a good berth. Should the wind be light she should also keep as close to the islands on the West coast of the strait as possible, on account of the N.E. and easterly currents.

Should the wind be foul, no time should be lost in trying to pass North of Geby; but it should be left to the northward, the ship passing between it and Gagy, and entering the Pacific by one of the channels near Syang. But, whenever it can be done, the West channel between the coast of Gilolo and the Shaupee Isles, or between these islands and Syang, is preferable, because with a northerly wind we can pass to windward of the Islands of Ayou and Asia. Should there be any difficulty in passing West of the Asia Isles, the channel formed by them and Ayou, or even that between this latter and the North coast of Waigiou may be adopted.

Having gained the Pacific, the vessel should endeavour, as soon as possible, to reach the zone comprised between the parallels of 1° 30′ and 3° N. lat., and make her Easting; keeping within those parallels, as Southerly and S.E. currents are found there; and she will thus attain the latter part of the route, previously mentioned, from Dampier Strait, China Sea.

A detailed account of the Eastern routes to China, has been now given, because they furnish a general idea of the navigation of the channels, and show how, according to conditions, a vessel may profit by them; and these are the two most frequented routes for proceeding to China during this season.

Great Eastern Route from Cape of Good Hope to China during the N.E. Monsoon.—The following route may also be adopted during this season by a ship from Europe, and when the Cape is left in September; this, which is called the Great Eastern Route to China, is the most certain.

From South of the Cape a vessel should steer East, keeping between the parallels of 38° and 40°, or thereabouts, as far as the meridian of Cape Leuwin. From thence one of two routes may be taken: that South of Tasmania, or that by Bass Straits.

The first route was adopted by Capt. Butter, of the ship *Walpole*. He left the Cape of Good Hope in the end of September; on the 31st of October he sighted the S.W. point of Tasmania; on the 18th of November he sighted the island of Anno-Bom, one of the New Hebrides; he left these islands a little to the West, crossed the equator West of the Island of Paanopa, in about 161° 40′ E. long., and crossed the archipelago of the Carolines. On the 21st of December he passed the Marianne Islands; on the 30th he entered the strait South of Formosa, and on the 1st of January anchored in the harbour of Macao.

Thus the voyage lasted three months; that is, it occupied only a little more than the time that is generally occupied by the direct route to China during the favourable season.

Thus about two months is the time from the Cape to the strait of Sunda, and three weeks from the strait of Sunda to the Canton River.

Again, instead of passing South of Tasmania, captains generally steer through Bass Straits. This route was taken by the *Athenian* in 1804. On the 11th of October the frigate passed Amsterdam Island; entered Bass Straits the 28th of October; passed West of New Caledonia and the Hebrides, and then between these latter and the Solomon Isles. She crossed the line in 160° E. long., and sighted the coasts of China on the 28th of December. Notwithstanding this, and although the route is much shorter, Admiral Krusenstern prefers passing South of Tasmania. His opinion is founded on meeting Westerly winds in high latitudes, and by passing South of Tasmania Northerly winds and Southerly currents, often met at the entrance of Bass Strait, are avoided. The voyage from the Channel to Canton is from five to six months.

(To be continued.)

CLEARING THE LUNAR DISTANCE.

Scarborough, February 6th, 1858.

Sir,—Lieut. Murray's Lunar Method (page 19 of this Magazine) may be shortened by the following rule, which I hope you will be pleased to insert in the next number of the Magazine.

We must first provide ourselves with a table of "Augmented Refractions," which may occupy one or two pages, easily constructed; the formula is: $\frac{\text{Refraction}}{\text{Cos. Alt.}}$

Here is, in the margin, a specimen of the table adapted for the barometer at 30 inches, and the thermometer at 50°.

Alt.	Aug. Ref.
Bar. ° ′	′ ″
27 0	2 8
27 30	2 6
28 0	2 4
28 30	2 2
Ther. °	′ ″
40	1 31
41	1 29
42	1 27
43	1 26

Rule—1. With the app. alts. of the moon and star, take out the "Augmented Refractions," observing, in case of the sun, to deduct his parallax. Subtract the moon's aug. refr. from the horizontal parallax, and the remainder will be the "Corrected Parallax."

2. In *first* column, write the sine of ☾'s app.alt.; and the cosecant of the app. distance; and in *second* column, write the sine of ☉'s (or ✶'s) app. alt. and the cotangent of the app. dist. The sums of these columns will be the logarithms of natural numbers to 2 or 3 places, subtract the less from the greater, and make sign + or — according as the first term is greater or less than the second, and the difference will be the Solar Ratio.

3. In other two columns, copy from the first line of the above columns the sines of the alts. in the same order, and from the second line repeat the logs. of the app. dist., but reversed in their situation.

The sums of these columns will be the logs. of numbers to 4 places, and proceed as above, and the diff. will be the Lunar Ratio.

If the app. dist. be greater than 90°, then both terms of ⊙ Ratio will become +, and both terms of ☾ Ratio —; take therefore, their sums instead of their diff.

4. Multiply ⊙ Ratio into ⊙'s aug. refraction, and ☾ Ratio into the "Corr. Parallax," and apply the products, according to the sign the ratio, to the app. dist.

N.B. It would be convenient to employ the table of log. sines of minutes and seconds (Raper's 66), which saves the trouble of reducing minutes and seconds of the corr. par. to seconds: add together the log. of ☾ ratio, and the sine of the corr. par. and the sum is the sine of ☾'s corr. of distance (or second corr.).

5. For the third corr. of dist. Enter table 56 (Raper's) with the app. dist. corrected, and ☾'s corr. of alt. (to the minute), and take out the seconds. Enter again with the second corr., take out the corresponding seconds, and the diff. of these two seconds is the third corr. of dist. Apply this corr. as directed in the table.

Example 1.—☾ app. alt. 23° 3′, app. alt. ⊙ 58° 5′, app. dist. 56° 56′ 31″, ☽ hor. par. 55′ 23″: find the true distance.

Dist. less than 90°.

☾ sine	9·5928	⊙ sine	9·9288	9·5928	9·9288		
D cosec.	·0766	cot.	9·8133	9·8133	·0766		
log.	9·6694	log.	9·7421	9·4061	0·0054		
=	+0·467	=	—0·552	= +·2547	= —1·013		
			+ ·467		+ ·255		
		⊙ ratio =	—0·085		☾ ratio = — ·758		
		⊙'s aug. refr.	64″				
			340	☾ hor. par.	55 23		
			510	☾ aug. refr.	2 29		
		1st. Corr.	—5·4″	Corr. Par.	52 54	sine	8·1872
					☾ ratio	log.	9·8797
				2nd corr. =	—40 5	= sin.	8·0669
				1st. corr.	— 0 5		
					—40 10		
				App dist.	56 56 31		
					56 16 21		
				3rd corr.	+7		
				True dist.	56° 16′ 28″		

This example by trigonometrical method gives true distance 56° 16′ 27″.

Example 2.—☾ app. alt. 25° 51′, ☉ 29° 27′, app. dist. 99° 58′ 58″, ☾ hor. par. 58′ 34″: find the true distance.

	′	″
☾ hor. par.	58	34
☾ aug. refr.	2	13
Corr. par.	56	21
☉ aug. refr.	1′	50″

Dist. greater than 90°.

☾ sine	9·6395	☉ sine	9·6917	9·6395	9·6917		
D cosec	·0066	cot.	9·2456	9·2456	·0066		
log.	9·6461	log.	8·9373	8·8851	9·6983		
= +	·443	= +	·087	= −·0768	= −·4992		
		+	·443	−·4992			
		☉ ratio	= + ·53	☾ −·5760			
		☉ aug. refr.	110″			log.	9·7604
		1st corr.	+58·3″	Corr. par.	56′ 21″	sine	8·2146
				2nd corr.	−32′ 27″	= sin	7·9750
				1st corr.	+ 58		
					−31 29		
				App. dist.	99 58 58		
					99 27 29		
				3rd corr.	−2		
				True distance	99° 27′ 27″		

The trigonometrical method gives true distance 99° 27′ 26″.

I am, &c.,

EDWARD H. HEBDEN, Jun.

To the Editor of the Nautical Magazine.

ADMIRALTY NOTICE RESPECTING LIGHTS AND FOG SIGNALS TO BE CARRIED AND USED BY SEA-GOING VESSELS, TO PREVENT COLLISION.—*By the Commissioners for executing the Office of Lord High Admiral of the United Kingdom of Great Britain and Ireland, &c.*

By virtue of the power and authority vested in us, we hereby revoke, as from and after the thirtieth day of September, 1858, the re-

gulations made and published by us on the first day of May, 1852, relating to the Lights to be carried by Sea-going Vessels to prevent collision: And we hereby make the following regulations, and require and direct that the same be strictly observed and carried into effect on and after the first day of October, 1858.

Steam Vessels.

All Sea-going Steam Vessels, when under Steam, shall, between sunset and sunrise, exhibit the following Lights:

1. A bright White Light at the Foremast Head.
   A Green Light on the Starboard side.
   A Red Light on the Port side.

2. The Mast-head Light shall be so constructed as to be visible on a dark night, with a clear atmosphere, at a distance of at least 5 miles, and shall show an uniform and unbroken light over an arc of the horizon of 20 points of the compass, and it shall be so fixed as to throw the light 10 points on each side of the ship, viz.: from right ahead to 2 points abaft the beam on either side.

3. The Green Light on the Starboard side and the Red Light on the Port side shall be so constructed as to be visible on a dark night, with a clear atmosphere, at a distance of at least 2 miles, and show an uniform and unbroken light over an arc of the horizon of 10 points of the compass, and they shall be so fixed as to throw the light from right ahead to 2 points abaft the beam on the Starboard and on the Port sides respectively.

4. The side Lights are to be fitted with inboard screens projecting at least 3 feet forward from the light, so as to prevent the lights from being seen across the bow.

5. Steam Vessels under Sail only, are not to carry their mast-head Light.

Fog Signals.—All Sea-going Steam Vessels, whether propelled by paddles or screws, when their steam is up, and when under way, shall in all cases of Fog use as a Fog Signal a Steam Whistle, placed before the Funnel at not less than 8 feet from the deck, which shall be sounded once at least every five minutes; but when the steam is not up, they shall use a Fog Horn or Bell, as ordered for Sailing Ships.

Sailing Vessels.

1. All Sea-going Sailing Vessels when under way or being towed shall between sunset and sunrise exhibit a Green Light on the Starboard side and a Red Light on the Port side of the vessel, and such Lights shall be so constructed as to be visible on a dark night, with a clear atmosphere, at a distance of at least 2 miles, and shall show an uniform and unbroken light over an arc of the horizon of 10 points of the compass, from right ahead to 2 points abaft the beam on the Starboard and on the Port sides respectively.

2. The Coloured Lights shall be *fixed* whenever it is practicable so to exhibit them; and shall be fitted with inboard screens projecting

at least 3 feet forward from the Light, so as to prevent the Lights being seen across the bow.

3. When the Coloured Lights cannot be fixed (as in the case of small vessels in bad weather), they shall be kept on deck between sunset and sunrise, and on their proper sides of the vessel, ready for instant exhibition, and shall be exhibited in such a manner as can be best seen on the approach of, or to, any other vessel or vessels, in sufficient time to avoid collision, and so that the Green Light shall not be seen on the Port side, nor the Red Light on the Starboard side.

Fog Signals.—All Sea-going Sailing Vessels, when under way, shall, in all cases of Fog, use when on the Starboard Tack a Fog Horn, and when on the Port Tack shall Ring a Bell. These signals shall be sounded once at least every five minutes.

Sailing Pilot Vessels are to carry only a White Light at the Mast-head, and are to exhibit a Flare-up Light every 15 minutes, in accordance with Trinity House regulation.

Vessels at Anchor.

All Sea-going Vessels when at anchor in roadsteads or fairways, shall between sunset and sunrise exhibit where it can best be seen, but at a height not exceeding 20 feet above the hull, a White Light in a Globular Lantern of 8 inches in diameter, and so constructed as to show a clear, uniform, and unbroken light all round the horizon, at a distance of at least 1 mile.

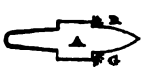
Given under our hands this 24th day of February, 1858.

CHARLES WOOD.
R. S. DUNDAS.

By Command of their Lordships,
W. G. ROMAINE, *Secretary.*

The following Diagrams are intended to illustrate the use of the Lights carried by vessels at sea, and the manner in which they indicate to the vessel which sees them the position and description of the vessel which carries them:—

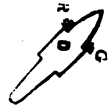
First.—When both Red and Green Lights are seen: A sees a Red and Green Light ahead;—A knows that a vessel is approaching her on a course directly opposite to her own, as B;



If A sees a White Mast-head Light above the other two, she knows that B is a steam vessel.

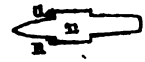
Second.—When the Red, and not the Green Light is seen: A sees a Red Light ahead or on the bow;—A knows that either,—1, a vessel is approaching her on her port bow, as B;

or, 2, a vessel is crossing in some direction to port, as D D D.

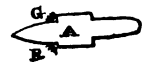


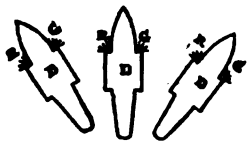
If A sees a White Mast-head Light above the Red Light, A knows that the vessel is a steam-vessel, and is either approaching her in the same direction, as B, or is crossing to port in some direction, as D D D.

Third.—When the Green, and not the Red Light, is seen: A sees a Green Light ahead or on the bow;—A knows that either,—1, a vessel is approaching her on her starboard bow, as B;



or, 2, a vessel is crossing in some direction to starboard, as D D D.





If A sees a White Mast-head Light above the Green Light, A knows that the vessel is a steam-vessel, and is either approaching her in the same direction as B, or is crossing to starboard in some direction, as D D D.

Godrevy Light.

The Trinity House has given notice of a light-vessel being placed in the Sound off Godrevy Island while the light is building on it. Our opinion on this subject is already recorded, and in a future number we shall consider the arguments relating to it as they have been stated in the House of Commons. Meanwhile, we preserve the following view of it by the *Shipping and Mercantile Gazette*:—

One of the few speakers in this discussion who appeared really to possess a practical acquaintance with the affair, was Mr. Bentinck, who promised Mr. Smith his support if he went with his motion to a division. "This (observed that honourable gentleman) is not a local question; it is a general question, and a light of this kind would be of advantage to the whole trade of the Bristol Channel. The House is bound, therefore, to look upon it in a national point of view. After all (he continued) it is a question of money *versus* life, and it would be found—not from any want of humanity, but from the total ignorance which prevailed on the subject, and which was attributable to the Board of Trade not being composed of practical men—that that Board invariably set aside questions which affected the saving of life, and confined themselves to the saving of money." These remarks really go to the root of the matter, and supply the most sufficient reason for the refusal of the Board of Trade to be guided by the reasoning of practical and disinterested persons on the subject of this Godrevy Light. Our own opinions on the question have been so fully recorded that it is needless to repeat them here; but this we will say, that for all the casualties which may henceforth occur on the Stones, and which might be avoided by the erection of the lighthouse for which we have contended, the Board of Trade will be morally responsible. The projected light on Godrevy Island will act simply as a lure to vessels entering or leaving the Bristol Channel and the Irish Sea. To such ships it can possibly afford no protection against the Stones, which constitute the real danger of St. Ives Bay; and when the erection has been completed it will be found that a light on the Stones is more needed than ever, and it must eventually be constructed.

The notice issued by the Trinity House states that the light-vessel shows a *revolving light, flashing at intervals of* 10 *seconds*, and is placed midway between the Stones and Godrevy Island, and *cautions* vessels passing outside of the Stones not to approach within "one mile and a half of her."

A buoy has been placed to the Northward of the Stones in 8 fathoms, with Lelant Church in line with Heva Rock S.W.b.S., and Lethegga Rock in line with the Northernmost Stone S.E.

LIND'S ANEMOMETER,—*By Sir W. Snow Harris.*

6, Windsor Villas, Plymouth, 15th March, 1858.

Sir,—I should feel obliged by your allowing me to state in the way of further explanation of the graduated scale of my new Wind Guage, an account of which you were so good as to insert in your last number; that the calculation I have given in page 118, at the close of paragraph (10), supposes the final addition of the constant $\frac{3}{20}$ due to capillary attraction,—although somewhat obscurely expressed. It may perhaps be more clear and explicit to consider the altitude for one inch pressure above the level marked A to be measured immediately from that line instead of $\frac{3}{20}$ below it,—we then directly include the correction for capillary action, allowance being made for the descent of the fluid in the large tube equal to the $\frac{1}{16}$ of the elevation in the small tube,—taken in this way we have the point of actual pressure above A, due to a column of water an inch high $= 1 - \frac{1}{16} \times \frac{17}{20} = \cdot 947$, which must be the altitude on the vertical scale above the line A representing a coloumn of fluid an inch high + capillary attraction, the total altitude will then be $\cdot 947 + \cdot 053 + \cdot 15 = 1 \cdot 15 = 1 + \frac{3}{20}$,—this being determined we may proceed to divide into inches and tenths for the remainder of the scale, and subdivide below into tenths for all the first inch as thus determined.

NAUTICAL NOTICES.

PARTICULARS OF LIGHTS RECENTLY ESTABLISHED.

(Continued from p. 165.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
18.*						
19. Belle Isle	S.W. point of Island	Labrador	F.	470	28	Est. 15th March, '58. 51° 58′ N., 55° 23′ W.
19. Forteau Bay	Point Amour	Labrador	F.	155	18	Est. 15th April, '58. 51° 27·5′ N., 56° 50·5′ W.
20. Gaspe	Cape Rozier	L. Canada	F.	136	17	Est. 15th March, '58. 48° 51·6′ N., 64° 12′ W.
20. Anticosti	West Point	St. Lawrence	F.	112	15	Est. 15th March, '58. 49° 52 5′ N., 64° 32′ W.
21. Malaga	East Mole Head	Spain, South Coast	Ffl.		15	Alteration Est.? Flashes *red* every two minutes.

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

In reference to the above lights recently established in the river and gulf of St. Lawrence and strait of Belle Isle, we are enabled to

* See Variations in the North and Baltic Seas.

add the following note from the announcement of them from a local publication, as well as the distance of the several *landing piers* below Quebec and their dimensions, that may prove useful information to our seamen.

Note.—On and after the first day of September next, signals will be given at or near each of the above lighthouses by means of an air or fog whistle, sounded at short intervals during foggy weather and snow storms, or by a 9-pr. gun fired every hour, in case of the whistle being out of order.

Landing Piers River St. Lawrence, below Quebec.

Name of Pier.	Miles below Pt. Levi.	Locality.	Extreme Length.	Depth of Water at Pier-head, lowest tide
			feet.	feet.
Berthier.....	20	S. shore St. Lawrence	587	15
L'Islee	40	Ditto.	1200	8½
Pointe aux Orignaux.	66	Ditto.	1200	15
Riviere-du-Loup	96	Ditto.	1667	16
Rimouski	150	Ditto.	2150	8½
Eboulemens	53	N. shore St. Lawrence	920	9½
Malbaie.....	60	Ditto.	475	18
Grosse-Isle Pier		Quarantine Isld., off the Parish of St. Thomas	350	16

Daily Colonist, Toronto.

LIGHTS RECENTLY ESTABLISHED *(and in Operation) by the Ottoman Government in the Dardanelles, Sea of Marmora, Bosphorus, and Black Sea.*

The Ottoman Government has just established a series of lights in the Dardanelles, Sea of Marmora, the Bosphorus, and Black Sea for the improvement of navigation.

We give the annexed account of them as a vessel would see them on her way from the Archipelago to the Black Sea. It will be observed that on the Asiatic side (starboard hand) the sea lights are *red* and *flashing*, and the harbour lights *red* and *fixed;* while those on the European side (port hand) *green* and *fixed*, or *green* and *flashing*.

The navigator entering the Dardanelles will find the following lights:—

1. Cape Helles (coast of Europe, to port on entering): a revolving light, eclipsed once a minute; height above the sea, 118 feet; visible 18 miles; lat. 40° 2′, long. 26° 10′.

2. Koum-Kaleh (starboard on entering, the first Asiatic castle): two fixed red lights, vertical; height, 49 feet; visible 4 miles; lat. 40°, long. 26° 12′.

3. Chanak-Kalehsi (on the low battery of the second Asiatic castle, town of Dardanelles): two harbour lights, fixed and red, vertical; height, 49 feet; visible 4 miles; lat. 40° 8′, long. 26° 24′.

4. Kilid-Bahr (coast of Europe, fort of Namasich, opposite Chanak-Kalessi): two harbour lights, fixed, green, vertical; height, 43 feet; visible 4 miles; lat. 40° 8′, long. 26° 23′.

5. Nagara-Kaleh-Si (Asiatic coast, on the tower of the same castle of Nagara): varied by red flashes; height, 49 feet; visible 4 miles; lat. 40° 11′, long. 26° 24′.

6. Bovali-Kaleh-Si (coast of Europe, in the fort of Bovali, facing and bearing N. 37° W. from the castle of Nagara): two harbour lights, fixed, vertical; height, 46 feet; visible 4 miles; lat. 40° 12′, long. 26° 23′.

7. Point Galata (coast of Europe): two green lights, fixed, vertical; height, 65 feet; visible 4 miles; lat. 40° 19′, long. 26° 34′.

8. Gallipoli (coast of Europe, in the tower nearest to the N.E. side of the town): revolving, eclipsed every minute; height, 115 feet; visible 18 miles; lat. 40° 24′, long. 26° 39′.

9. Point Echerdakh (coast of Asia, S.E. of Gallipoli): two harbour lights, red, fixed, vertical; height, 59 feet; visible 4 miles; lat. 40° 20′, long. 26° 30′.

In the Sea of Marmora the following appear:—

10. Lighthouse Island (1½ mile East of Island of Marmora): light varied by a red flash every two minutes; height, 131 feet; visible 12 miles; lat. 40° 37′, long. 27° 45′.

11. Cape Stefano (coast of Europe): light varied by a flash every two minutes; height, 65 feet; visible 14 miles; lat. 40° 57′, long. 28° 50′.

In the Bosphorus:—

12. Point Serail (coast of Europe, port hand on entering): light varied by a flash every minute; height, 118 feet; visible 14 miles; lat. 41°, long. 28° 59′.

13. Fanar-Baklche (coast of Asia, point South of Scutari): fixed light; height, 36 feet; visible 10 miles; lat. 40° 58′, long. 29° 1′.

14. Leander Tower (coast of Asia): two red fixed lights, vertical; height, 36 feet; visible 4 miles.

15. Anadoli-Finer (coast of Asia, starboard hand on entering the Black Sea): light varied by a flash every two minutes; height, 249 feet; visible 16 miles; lat. 41° 13′, long. 29° 9′.

16. Roumali-Fener (coast of Europe, on port hand entering the Black Sea): a fixed light; height, 190 feet; visible 14 miles; lat. 41° 14′, long. 29° 6′.

In the Black Sea:—

17. Cara-Bouroun (coast of Europe, 22 miles W.b.N. from the entrance of the Bosphorus): revolving light, eclipsed every ten seconds; height, 302 feet; visible 24 miles; lat. 41° 19′, long. 22° 40′.

18. Sulina (on the western side of the Sulina mouth of the Danube): fixed light; height, 69 feet; visible 15 miles; lat. 45° 10′, long. 29° 40′.

19. Isle of Serpents (on the highest part of the island): revolving light, eclipsed every 20 seconds; height 197 feet; visible 10 miles; lat. 45° 15′, long. 30° 10′.

Such are the lights established and in operation now. They answer perfectly for the navigation of the straits; they are very distinct, and the difference in their characters, colour, and intensity is such as to remove all possibility of mistake. But the Ottoman Government intends completing its work. It desires that the entrance of the Dardanelles should be equally facilitated, and with this view intends constructing a lighthouse on Cape Sigri (Isle Sigri, West coast of Myteline) to show a revolving light, which shall be visible 24 miles. Also on Tenedos two lights: one, fixed, on the West point, to be visible 15 miles; and a light varied by red flashes on the little island of Gadero, off the town of Tenedos, that shall be visible 10 miles.

But it is to be further remarked that a ship entering the Sea of Marmara from the Dardanelles will not be able to see the light on the islet East of Isle Marmara. Therefore, to facilitate this route, the Ottoman Government intends placing a revolving light on Cape Kora (European coast, opposite to Marmora), which will be eclipsed every half minute, and be visible at the distance of 18 miles. This light it seems will be much better placed here than on the West part of Marmara, for the winds adverse to ships proceeding upwards are those from the northward, and it is fortunate that the European coast may be approached boldly.

When these last four lights are completed, and some minor ones on the salient points of the Bosphorus, no coast in the whole world will be better lighted. The lights already established are highly spoken of—no complaint from commanders of vessels has been made against them; on the contrary, indeed, they are much admired, not only for their positions, but also their good character; and all agree in the opinion of the facility of entering and navigating the straits by them as easily by night as by day.—*Moniteur de la Flotte.*

Bonifacio Strait *and its Dangers. Improvement of Navigation.*

A commission, composed of three Sardinian and three French officers, in the course of last autumn was engaged in examining the Strait of Bonifacio, with a view of lessening the dangers of its navigation, and recommended the following improvements:—

A light of the third or fourth order on Point Beeche of Isle Lavezzi; the erection of which would depend on the removal of the rock of the same name.

Three beacons on the rocks Tigneso di Ratino, Chiappino, and Pecorella.

Nine buoys placed as follows: 1, Monaci Rocks; 2, on the little rock of Olmetto; 3, on the Lovezzi Rock; 4, on the Seche (? Prete), near Point Syrono; 5, on the Casse, to the West of Paroja; 6, on the eastern extreme of Gavetti; 7, on the Toro; 8, on the Vacca; 9, on the Bank of Beneditto, in the Gulf of Porto Vecchio.

These several measures are admitted as required by the administration, with the exception of the light of Lavezzi and the buoy on the Casse to the West of Isle Paroja. But instead of distinguishing the Monaci and Olmetto by towers of masonry, and the Gavetti by a beacon, the commission has demanded the placing of buoys on the different rocks, no doubt in consequence of the difficulties which the execution of the projected works will meet with.

Pending the construction of the lighthouse of Lavezzi, which may be deferred, the rock will be provisionally distinguished by a bell buoy. It is understood that the works will be immediately commenced.

The works which the Sardinian Government are constructing are as follows:—

A light on the Scorno of Asinara.

A light on Cape Ferro, on the East of the isles, to facilitate the entrance and for the guidance of ships passing them.

A light on Point Galera, Isle Caprera.

To improve the light of La Testa to a light of the first or second order, as it is not sufficiently powerful.

A beacon of iron or masonry on the Paganetto, a danger situated at two miles West of the South point of Spargiotto.

A buoy on the Spargi Rock, to the S.W. of Spargi.

Dangers on the N.W. Coast of Borneo and Palawan Passage. *China Sea.*

Two coral banks are reported in the China Sea by H.M.S. *Fury* on the N.W. coast of Borneo.

The first, in lat. 5° 42′ N., long. 114° 59′ E., is N.W. of 4 fathoms marked Samarang, and is 4 or 5 miles from East to West, and 3 to 4 miles broad, showing breakers for a mile and a half; the deepest water found was 12 and the least 6 fathoms.

The second, in lat. 5° 56′ N., long. 114° 50′ E., of about the same extent, showed no breakers; but from no bottom with the hand lead, the bank was first struck on one side with 11 fathoms, and on the other with 7. A course West one mile and a half and North, shoaled the soundings to 4¾ fathoms, which suddenly deepened, and in two casts more there was no bottom.

Caution.—Great attention should be paid to the lead, and a good look-out kept for discoloured water when in this neighbourhood, for i

is well known to be full of shoals, and the mariner is cautioned not to make too free in that navigotien.

Rogers Breakers.—Heavy breakers were seen every three or four minutes, bearing East 2 or 3 miles, from the P. and O. C. steam vessel *Formosa*, Capt. J. M. Rogers, at 6.50 a.m. January 4th, 1858, from Singapore towards Hong-kong by the Palawan Passage. Broken water, about 10 yards in extent North and South, was apparently caused by a rock a few feet under water. Soundings were occasionally tried for with 100 fathoms, no bottom. The weather was thick and rainy, but at 11h. a.m. it cleared up and Mantaleengahan mountain, 6,843 feet high, on Palawan, bore E.N.E. ¼ N. The position of the breakers is calculated to be in lat. 8° 21′ N., long. 116° 25′ E.

Variation 1° 20′ E. in 1858.

Variation of the Compass, 1858,—*in the North and Baltic Seas.*

The following information respecting the Variation of the Compass in the North and Baltic Seas—in continuation of that relating to the British Isles, (see p. 563 of vol. 1857,)—is made public in order to apprise mariners of the decrease in the variation, which in the North Sea at present averages 7 minutes annually, and in the Baltic Sea about 5 minutes; as also to enable mariners and agents for the sale of charts to correct the numerous sailing directions and charts now in use, in which the variation is erroneously noted.

From the Eastern coast of the British Isles to the Kattegat, the present general direction of the lines of equal variation is N.b.E. and S.b.W. (true), ranging in amount from 25° to 16°;—and from the Kattegat to the Gulf of Finland, the lines of equal variation are nearly North and South (true), ranging from 16° to 5° Westerly.

Eastern Coast of British Isles.—At Lerwick and Sumburgh Head 25° W., Pentland and Moray Firths 25¼° W., Buchanness and Fifeness 24¾° W., Holy and Farn Islands 24° W., Shields, Sunderland, and Hartlepool 23½ W., Flamborough Head 22¾° W., The Wash and Dudgeon 22° W., Leman and Ower, Yarmouth and Orfordness 21¼° W., River Thames 21½° W.

Coasts of Belgium, Netherlands, Hanover, and Western Shores of Denmark.—At Ostende 20° W., River Schelde entrances and Texel 19½° W., Ems River and Hantsholmen Light 18½° W., Helgoland Island 18° W., Elbe River entrances, Cuxhaven and Tonning 17½° W.

S.W. and South Coasts of Norway, and the Skagerrak.—At Fens Fiord, to Bucke Fiord 21½° to 20½° W., Eggersund 20° W., Naze of Norway 19¼° W., Christiansand 18½° W., Christiania, Bohus Bay or the Sleeve and Skaw Light 17° W.

Kattegat, Little and Great Belts, and the Sound.—At Læso Island 16½° W., Gottenburg and Anholt Island 16° W., Little Belt and Kiel

16¾° W., Great Belt and Lubeck 16¼° W., Copenhagen and the Sound 15¼° W., Bornholm Island 14° W.

Coasts of Sweden.—At Carlskrona 13¾° W., Oland Island and Nyköping 13° W., Landsort Light and Stockholm 12¼° W., Soderarm and Understen Lights 11½° W., Gothland, South point 12° W., Farö and Gottska Sando 11½° W.

Coasts of Prussia.—At Rugen Island 14¾° W., Stettin 14¼° W., Jershoft Light 13° W., Danzig 12° W., Konigsberg 11° W., Memel 10½° W.

Coasts of Courland and Livonia.—At entrance to Gulf of Riga 9½° W., Riga 8½° W., West coast of Osel and Dago Islands 9¾° W.

Gulf of Finland.—At Hango Head and Odensholm Light 8¾° W., Helsingfors and Revel 7¾° W., Hogland Island 6½° W., Kronstat 5¼° W., St. Petersburg 4¾° W.

Gulf of Bothnia.—At Aland Islands 11° W., Söderhamn 13° W., Umea 11° W., Biurö Head 10° W., Tornea and Brahestad 8° W., Gadd, and Norr Skär Lights 10½° W., Waso, Biörneborg, and Nystad 10° W.

H.O. Admiralty, 14th February, 1858.

French Survey of the Coast of Italy.

The hydrographical operations of the French Government on the coast of Italy, were commenced last year earlier than usual. As yet the survey of the coast in front of the Pontine Marshes had not been made, a work which during the great heat of summer would have produced fatal effects on the health of those employed. The *Meteor* was therefore sent on this service in the commencement of April, so as to profit by the most favourable time for performing the work.

Unfortunately the month of April was bad throughout, which, however, thanks to the exertions of the officers employed, did not much delay the work, so that early in June the soundings and the topographic details of that portion of the coast between the mouth of the Tiber and Mount Circelio was completed.

The *Meteor* then proceeded to Naples, where she was at the end of June, after completing the soundings off the coast of the Pontine Marshes already commenced, and a part of that begun the previous season as far as off Gaeta and the isles of Ponza.

The month of July was employed in surveying the shore of the gulf of Naples from the environs of Portici, to which the survey of last year extended, as far as Cape Sottile beyond Cape Campanella, including the isle of Capri. This survey, which does not include less than forty-three miles, admits of the old charts being replaced by new correct ones, showing some dangers previously unknown. M. Darondeau and M. Gaussin and Manen attached to him, were afterwards occupied in examining the Lipari Isles, Stromboli; the Panaria

Group and the central group including Vulcano, Lipari, and Salina, have been surveyed in detail, and the two isles Felicudi and Alicudi are all that remain.

The result of this season's work is 155 miles of coast surveyed: 52 of the shore of the Pontine Marshes, 43 of the gulf of Naples, and 60 of the Lipari Isles.—*Moniteur de la Flotte.*

SHOAL—25 *Miles South-Westward of Natal—(Aliwal Shoal.)*

Simons Bay, August 26th, 1857.

Sir,—During a late visit to Natal, I was informed by Mr. G. C. Cato, agent for Lloyd's at that port, of the existence of a shoal upwards of five miles from the shore, off the mouth of the Bloody River. This gentleman furnished me with a land survey of the coast in the neighbourhood, made by Mr. R. Anderson, Government Surveyor, who fixed the position of the shoal while breaking by intersection from two locally fixed points of his survey. I have referred his observations to the Admiralty chart, by which the position of the shoal is as follows:—Bloody River mouth (true) N. 30° W. 5½ miles; Cape Natal N. 40° E. 25½ miles.

Several masters of ships have seen the sea breaking heavily at this spot, one of whom sounded near it and found 4½ fathoms on a sandy bottom. This must be the shoal marked "Aliwal" on the Admiralty charts, and as it lies so much further off shore than there represented, I am induced to furnish this notice, in order that vessels passing may be informed of the danger.

I have, &c.,

F. SKEAD, *Master, R.N. in charge of Survey.*

[A brief account of the Aliwal Shoal here alluded to will be found in our vol. for 1850, p. 463.—ED.]

SALMEDINA BANK,—*Coast of New Granada.*

According to a notice published in the *Gazette officialle de la Nouvelle Grenade*, by Mr. Stephen, Master of the *Indus* ship of war of the British Royal Navy;—

The Salmedina Bank extends three miles East and West and one and a half mile from North to South. When on its Southern edge the Popa bears N. 65° 5′ E. (true); Fort San Josef, S. 57° E., and in line with the sandy point. When on its Northern edge the Popa bears N. 76° E., and the S.W. extreme of Tierra Bomba S. 38° E.

The Western edge of the bank on which the sea breaks is five and three quarter miles West of Tierra Bomba, and in lat. 10° 23′ 45″ N., and long. 75° 41′ 39″ W., counting from the meridian of Fort Pastelillo, which is considered in 75° 33′ 15″ W.—*Moniteur de la Flotte.*

THE MERCHANT SHIPPING ACT.—*Deputation to the Board of Trade.*

On the 17th March a very influential deputation from Liverpool, Southampton, and London, had a lengthened interview by appointment with the Right Hon. J. W. Henley, the President, and Earl Donoughmore, Vice-President of the Board of Trade, at Whitehall, for the purpose of requesting her Majesty's Government to make certain alterations to amend the Merchant Shipping Act of 1854.

Captain Reed addressed the President and Vice-President of the Board of Trade, and said that in coming before them to support the prayer of the memorial on behalf of the Mercantile Marine Service Association of Liverpool, that certain alterations and amendments may be made in the Merchant Shipping Act 1854, he felt it to be his duty in the first place to explain that they did not complain, nor consider that they had any reason to complain, of the manner in which the provisions of the Act had been carried into effect, or had been enforced, either by the Board of Trade or by the Local Marine Boards. The Act of 1854, in addition to consolidating the Acts relating to shipping and to merchant seamen, contained a number of clauses which it was thought would improve the state of the law with regard to those important branches of commerce. Whether those clauses would answer the purpose for which they were intended or not, was of course a matter of experiment. They had had a reasonable period of trial, and in the memorial the defects with regard to such portions of them as affected the Mercantile Marine Service were pointed out.

Although the management of a great portion of the matters relative to it rested with the Local Marine Boards, no provision had been made in the Act for securing upon these Boards some persons possessing a practical acquaintance with seamanship; so that when matters of nautical skill and knowledge came before the Local Marine Boards, instead of the Boards having the counsel and assistance of nautical men, with the position and responsibilities of being members of the Boards, they were obliged to seek the advice of their own officers, who may have been in the service, or otherwise to apply for the assistance of persons irresponsible for the advice which they might give. Of the necessity and expediency that there should be nautical men upon the Local Marine Boards they need only point to the Marine Department of the Board of Trade as a conclusive proof, and would respectfully submit that there were many men who have been in the British service who were in every way qualified to act as members of the Local Marine Boards. It was considered, too, that in addition to its being a simple act of justice to have the service represented at the Local Marine Boards, it would add (what they were satisfied was the earnest desire of the Board of Trade) to the improvement in position of the Service, and that the responsibility thus thrown on it would promote the discipline, education, and spirit of scientific investigation among merchant officers.

The degree of change which was sought to be made in the Marine Boards was very small, and fully set forth in the memorial. They had inserted in it that three merchant officers should be nominated by the Board of Trade, and that two be elected by the officers themselves: but he might add that they felt that the benefit of the alteration, if sanctioned, would soon be so apparent, that all the nautical members of the Board might be permitted to be elected by the Service. It would be observed that in the memorial it was also sought that the Local Marine Boards should have a somewhat more extended jurisdiction than at present—a jurisdiction which, now that the working of the Boards had been fully tried, it was trusted the Board would concur with them in thinking they might possess with advantage. It was also sought by the

memorial that some alteration should be made in the mode of inquiring into the causes of wrecks and casualties, in accordance with part viii. of the Merchant Shipping Act. The proceedings under this portion of the Act were only nominally inquiries, but practically they were the acts of a criminal court, in which the officer into the loss of whose ship an inquiry was instituted might be subjected to a punishment quite as severe as a long term of imprisonment, by being deprived, on the report of the Court of Inquiry, of his certificate. They considered that where the penalty was so severe, the judgment so irreparable, and the nature of almost every inquiry involved nautical questions, there ought to be in the constitution of the court more than one nautical person. The court at present was composed of a Stipendiary Magistrate, or two Justices, assisted by a Nautical Assessor appointed by the Board of Trade. The members of the Service did not object to the most rigid investigation, but they wished that investigation to be made in such a manner that, before their certificates were taken away, they might be specifically charged with some distinct breach for misconduct or default, as in the case of a criminal indictment, and that a due proportion of the persons before whom the charge was heard should be nautical men; and it was desired that the Board of Trade should act, not to pronounce, but to confirm the finding of the court, to mitigate, if it thought fit, the punishment, and act as a Court of Appeal. These were the alterations suggested, but which were too numerous for him to go through in detail, and the principal alterations in the Act which the Mercantile Marine Service considered ought to be made, and which they trusted would receive the serious attention and consideration both of the President and also of the members of the Marine Department of the Board, who were necessarily the best judges of many of the details.

The subject, it was believed, received considerable attention from the previous President, who, he (Captain Reed) believed, gave a promise to Lord Hardwicke, who brought the matter under the attention of the House of Lords during the last Session, that a Bill to amend the Merchant Shipping Act would be introduced during this. If he was right in so understanding, the draft of the intended alterations had, perhaps, already been prepared, and might assist the right honourable gentleman in the consideration of the present memorial. There was only one other subject to which he should refer, and that was in reference to the proposal to establish a fund to make a provision for the sick, worn out, and disabled officers of all grades, and seamen in the Merchant Service, and also to train and educate those who enter or are about to enter it. It was wished that the fund should, as far as possible, be of a self-supporting character; and although in many respects the national character and great importance of properly maintaining, educating, and encouraging the Mercantile Navy, gave its members some claim upon the consideration of the country, of the utility of making the provision sought he believed the President would quite agree with them, and that any difference of opinion must be only as to the best mode of raising a fund and in administering it. They had, in their suggestions, followed very much the mode of administering similar funds in America, and they believed that mode would be found to answer. It was, however, hoped that her Majesty might shortly be pleased to grant a charter to incorporate, like other scientific and learned bodies, the Mercantile Marine Service; and should this be the case, it was wished that the Council of the Incorporation should take a part in the management and administration of the fund. He trusted, in conclusion, that this statement would enable the President to understand with clearness the wants and wishes of the important class they represented, and would only add that they had confined themselves strictly to the portions of the Act affecting themselves, and trusted they had neither asked for anything intemperately, nor for anything which it would be unreasonable to grant.

Captain Engledue said he had much pleasure (as Chairman of the Southampton Association) in endorsing the matter contained in the Liverpool petition. The only fault he had to find was that it did not go quite far enough. The Commercial Marine generally had much to thank Government for in the able way in which the consolidation of the various Acts of Parliament affecting shipping had been carried out, in the shape of the Merchant Shipping Act of 1854; but when giving the Government credit for that portion which has benefited the Mercantile Marine, there was much new matter introduced, which was altogether unconstitutional, and, in fact, an interference with the liberty of the subject. Although the points in the Act of 1854 had been carefully looked through by the various Associations—a summary of which had been printed, and a copy of which he begged to hand to Mr. Henley—he (Captain Engledue) would, with his permission, comment upon a few of the clauses alluded to in the Act. He might preface his remarks by saying that the interests of the mariner and shipowner were identical and could not be separated, inasmuch as six out of every ten Commanders had a share in the vessel they commanded, consequently were *bonâ fide* shipowners as well as masters.

The first clause he would call attention to was that of the appointment of Inspectors and Surveyors by the Board of Trade. Care should be taken in their selection that they were practical scientific men, and from their position likely to command respect for their opinions. He regretted there were those under the Board of Trade that had not those qualifications. He should not name individuals, but simply state that documents could be found in the offices of the Board of Trade which would convince any practical man of their inefficiency. But, perhaps, those gentlemen were selected from the best material of the day. Then, again, with reference to the power of, and opinions given by these Surveyors. There ought to be a Court of Appeal on the spot, to prevent the exercise of that despotic power now held—such as fining or even imprisoning an officer who, in all probability, was a superior man to himself, because the said officer may not have replied to a question to his (the Surveyor's) satisfaction.

Then with regard to the withdrawal of certificates. The present system of placing a Commander at the bar almost like a common felon is highly objectionable, and the first question asked is, "Give me your certificate, sir," thus depriving the Commander of his only mode of obtaining a living, by condemning him before trial. Now, I maintain that a Commander having once passed his examination and obtained a certificate of qualification, has a right to retain that certificate as much as a Surgeon, Barrister, Lawyer, or other member of the learned professions has the right to follow up his calling, unless it can be shown that such Commander or officer has forfeited the confidence of Society by repeated acts of drunkenness, or otherwise disgraced himself as a man; and that a mere accident from error in judgment should not justify the authorities in depriving him of his certificate, the production of which being the only means of his obtaining employment in his particular calling at sea.

Then, again, the restrictions which have been placed upon certain members of the nautical profession, unless they can produce certificates of competency. I can speak from experience that I would much sooner trust a thorough-going old sailor with a certificate of service than one-half of those possessing that of competency.

The Mercantile Marine Fund requires the serious consideration of Government, that a provision should be established, under the authority of Government, to provide for the worn-out mariner when no longer enabled to follow the sea, and also a provision for the widow. It is quite lamentable to see the way in which the old worn-out mercantile mariner is neglected. Few reach the age of fifty years, but those, when no longer able to work, are obliged to go to the unions. This is a state of things which ought not to be allowed to

continue. Much of the prosperity of this great nation originates with the toil and hardship the sailor has to undergo, and, as a nation, we are equally bound to provide for him respectably in his old age. The plan we would recommend would be that mariners should be taxed at the rate of a shilling in the pound on their wages, and that shipowners should be relieved from all Passing Tolls and Light Dues, and made to contribute a like sum. This would produce a sufficient amount to secure to the Commanders a pension of £100 per annum, the Mate £50, Chief Engineer £50, and so on in proportion, and the Sailors, Firemen, &c., not less than £20 per annum, after a certain number of years' service, or when, from disease, incapacitated from continuing a sea-going life. This sum, subscribed for the shipowner and mariner, would be sufficient to give the widow a pension averaging from £50 per annum down to £10. Nothing would tend to elevate the mariner more than a scheme of this kind. From his occupation, being constantly at sea, he is unable to keep up his subscription to clubs, &c., as the landsman is in a position to do.

In inquiries into wrecks, &c., we feel that the constitution of the Courts of Inquiry should be changed, and that a larger proportion of nautical men should be introduced, who could understand the various seafaring terms used upon such occasions. There was an instance the other day at a port where a meeting took place on the subject of forming an association to correct the evils of the Act of 1854, when the Chairman, who was a Magistrate and a Clergyman, expressed himself much pleased at the prospect of a change in the law, as he considered himself quite incompetent to give judgment upon cases of a nautical character. The constitution of the present courts is altogether wrong and unconstitutional Then, again, the Collector of Customs and Board of Trade Solicitor have the power of summoning before them (preparatory to the trial) the Captain and officers, or such other persons as can give information, to get up a case for the Crown, upon which they are to try the unfortunate Commander—in fact, obtaining material for his self-destruction—altogether an un-English mode of proceeding.

Then, again, the liability question. This is a subject which materially affects the entire shipping interests of this country, and acts in many cases most prejudicially to these interests. In fact, many capitalists are seeking employment for their money in foreign bottoms, more particularly in America, where they are not subjected to this disastrous species of legislation—disastrous in the extreme to the British shipowner. The Act commonly called Lord Campbell's Act ought to be expunged from the British code without loss of time. The British shipowner ought to be placed on an equal footing with the foreigner, or how is he effectually to compete with him. At the present time—and I believe the records of the Board of Trade will bear me out—there is a larger amount of tonnage registered out of the port of New York than out of London and Liverpool put together, and much of this is British capital, driven out of the country from this vexatious law of liability.

Then, again, there is the important question of discipline. The fines named in the Act of 1852 are altogether inadequate to enable the Commander and officers of a merchant ship to enforce obedience. More power ought to be given to the Commander; and the law allowing the volunteering from the merchant ship on board a ship of war should be altered, so that no seaman should be allowed to leave his vessel unless with the consent of the Commander. An alteration in this clause would tend to improve the discipline in our merchant ships on foreign stations. If ships of war are short-handed, why not keep them complete by drafts from England, as in the case of the army, not distress the property a national vessel of war is supposed to protect.

The law should be altered with regard to the apprenticeship system, and all ships obliged to have a proportion of apprentices according to tonnage. I

think the gentlemen present will bear me out. And I know many officers of the Navy who complain in the same way, that the good old British tar has become defunct; and in lieu we have a set of nondescripts—neither sailor, soldier, tinker, nor tailor, and this not from any want of the raw material to make sailors of. But the discontinuance of the apprenticeship system has broken up the school or nursery for sailors. A boy originally was bound for seven years: he became part and parcel of his ship. The owner and commander took an interest in instructing him in his profession, which was equally advantageous to both, and at the end of seven years, and perhaps less, you had a first-rate sailor, valuable to the Commercial Marine, and the same to the Royal Navy. Whatever improves the efficiency of the one service must improve equally the other, and is worthy the attention of the Government.

Your early attention to the subject now before you will confer an obligation upon the Association I have the honour to represent, and should any further explanation be required I shall be happy to be in attendance. The whole question is one seriously affecting the shipping interests of this country. Interested parties used their interest, and succeeded in abolishing the apprenticeship system. Youngsters are now introduced, designated by the name of Midshipmen, but in other words are considered as so much light freight, paying a large premium for the voyage, and made to perform the rough work of the ship, without any attention being paid to their instruction, either professionally or morally. Such a state of things should be put a stop to, and the interests of the nation at large considered. There are some instances where shipowners have realised as much as £6,000 per annum by the abolishing of the apprenticeship system, but at the expense of our national greatness, producing, as I said before, a species of nondescript in lieu of a British sailor.

Captain Thomas Strickland, of the London Mercantile Marine Service Association, said that he was requested to express their approval of the objects named in the Southampton and Liverpool memorials; and also to state that in a short time the London Council would have the pleasure of presenting a memorial for further amendments on behalf of that Association, and a large number of outports acting in concert with them in this important matter.

The Right Hon. J. W. Henley replied at some length to the observations that had been addressed to him, and in doing so said he felt it was very natural that Masters of vessels should be of opinion that the present Courts of Inquiry were of an anomalous character, although he was very glad that the deputation had not complained of the injustice of any of the decisions that had been given. Still he felt that it would not do to wait for any decision of that description to take place. The subject of the memorial had been laid very fully and properly before him, and he could assure them that it should receive his most earnest consideration; that he would go into the details of the various statements that had been made, and see what could be done to make those alterations in the law which the members of the deputation asked. As to the proposition to raise a fund for the support of the aged and worn-out officers and seamen of the Merchant Service, he regarded it as one of the most important subjects that could engage the attention of any public man; and if, on due consideration, he could see his way clearly, or feel himself justified, he should give his countenance to the proposition. But he must remind them that the subject was a very large one, and presented many difficulties, both in its origin and in details.

He was not only very glad that the memorial had been laid before him in such a shape, but also that so excellent a *resumé* of it had been given by the Chairman of the Liverpool Association, and he again promised the Deputation that Earl Donoughmore and himself would go carefully over the whole of the statements and endeavour to give some kind of answer or devise some means that would give satisfaction to the Merchant Service—although from the re-

cent changes that had taken place in the Government, the Deputation must be aware that there might be con-iderable difficulties and some delay in giving the decision, as the House of Commons could scarcely be expected to listen to a Bill on this description of subject at so late a period in the session, and especially when that measure was brought in by a new Government.

On one subject which had been alluded to in the conversation that had taken place he wished to make a few remarks, and that was with regard to the apprenticeship system in the Merchant Service. One of the first things he did on taking office was to ask Lieutenant Brown, the Registrar-General of Seamen, how the system was working since the abolition of compulsory apprenticeships, and he was glad to say that the evil which had arisen from the apprenticeship system had had a decided effect in beginning to cure itself, and that there was, and had been for some years past, on the part of shipowners, a steady increase of apprentices in the Merchant Navy. In conclusion, he again promised that the whole of the important subject should have his most earnest consideration as speedily as possible.

Mr. Horsfall, M.P., then thanked Mr. Henley for the attention he had given to the various statements made by the gentlemen present, and urged upon him the speedy consideration of the whole subject.

BOTTLE PAPER.—*Moluccas.*

Colonial Department, the Hague, 27th February, 1858.

I have the honour to forward to you enclosed a notice respecting the ship *Albert Edward*, Capt. Henry Thomas Lyas, which has been sent to me by the Governor-General of Netherland India, with a request that it may be forwarded to its address. This notice was enclosed in a bottle and washed on shore on the Island Sarapo, one of the Spermonde Group, and was brought to the Governor of Celebes and its dependencies on the 6th December, 1857.

The Minister of Colonies.

MIJER.

J. W. May, Esq., Consul-General of the Netherlands.

Wednesday, April 29th, 1857.

This bottle was thrown overboard from the ship *Albert Edward* of Liverpool, from Manila towards Cork, in lat. 3° 4′ N., and long. 107° 9′ 0″ E, out seventeen days. Experienced a tedious passage from lat. 6° 30′ N., and long. 107° 50′ E., light airs and calms, with an E.N.E. set half knot per hour, and dead calm at present.

N.B. From leaving Manila and through the China Seas experienced a gentle 8½ knot breeze, proved no current there, wind prevailing North to E.N.E. Month of April, should this be picked up please forward same with lat. and long., and date, for the good of ships coming through this time of the year late, and oblige,

Yours most respectfully,

HENRY THOMAS LYAS, *Commander.*

To the Editor of the Nautical Magazine.

Property of Messrs. Taylor, Potter, & Co., Liverpool.

All well on board.

[The whole distance travelled by this paper is about a thousand miles. From about thirty miles East of the Anambas it has gone to the Southward, probably passing through the Carimata Channel, and travelled Eastward through the Java Sea, and drifted across the entrance of the strait of Macassar, till landed on the islet mentioned, about forty miles to the Northward of Macassar. The Westerly drift has evidently prevailed in the Java Sea and

across the Southern entrance of Macassar Strait. Our best thanks are due to Capt. Lyas for remembering us in those distant parts,—as well as to many more Commanders whose messengers are no doubt sleeping on some unfrequented shore unobserved.—ED.]

MEETING OF SHIPMASTERS AT KOORIA MOORIA ISLANDS.

At a meeting of Shipmasters and Agents, held on board the ship *I. K. L.*, on the 14th of January, 1858, at the Kooria Mooria Islands, and at which the following gentlemen were present, viz.:—Captains Stamper, *I. K. L.*; Rose, *Jane Frances*; Lowen, *Bonaventure*; Topping, *Rosina*; Nickels, *Victoria*; Finlay, *Eldorado*; Marley, *Gambia*; Anderson, *Jessie Byrne*; Gibson, *Jane Green*; Lucas, *Caduceus*; Morgan, *Clymene*; Leslie, *Florida*; Williams, *Prince of Oranye*; Flett, *Credenda*; Stewart, *Effingham*; O'Crook, *America*; Boyce, *Solatio*; Ellery, *Victoria*; Purves, *Sazon Queen*; Norman, *Albion*; Lindsay, *Lamorna*; Tindal, *Renown*; Tulloch, *Ariosto*; Douglas, *Queen's Hill*; Turnbull, *Halicore*; Matthews, *Maitland*; Draper, *Arab*; Joss, *Anna Mary*; Davidson, *Lauriston*; Evenson, *Oceana*; William Pickard, Esq., Agent; and George H. Brown, Esq., Agent.

It was moved by Mr. G. H. Brown, and seconded by Capt. Lowen, that Captain Stamper do take the chair, which motion was unanimously agreed to, and the chair was taken by Captain Stamper.

At the chairman's request Mr. Brown read to the meeting the circular issued by Messrs. Ord, Hindson, and Hays, to the public at home, when the following minutes were made:—

1. It was moved by the Chairman and unanimously agreed to, "That the statement of the said O., H., and H., in their said circular, that there are three islands, Haski, Jiblcea, and Ghurzood, covered with guano, is decidedly an incorrect statement."

2. Moved by Captain Rose, and unanimously agreed to, "That the statement of the aforesaid lessees, that 'the quality resembles that obtained from Ichaboe and Upper Peru,' is considered by us to be decidedly incorrect."

3. Moved by Captain Stamper, and agreed to by a majority, "That the statement of the lessees, that 'the facilities for loading are much greater at the Kooria Mooria Islands than at Ichaboe,' is also a very incorrect one."

4. Moved by Captain Lowen, and seconded by Wm. Pickard, Esq., "That the statement in the said circular, that 'the sea is perfectly smooth from the end of August to the end of April,' is also an incorrect statement; the fact being, the sea is very often rough, and several ships have lost more than one anchor from that cause." This motion was unanimously agreed to. The meeting also agreed "That there are no safe harbours for ships on the island of Jibleea, boats even not being always safe."

5. Moved by Captain Lowen, and seconded by Captain Draper, "That the statement in said circular, 'that abundance of men can be obtained from Aden,' is incorrect, the Indian Government having refused to allow labourers to leave Aden for the Kooria Mooria Islands." This motion was unanimously agreed to.

6. Moved by Captain Lowen, and seconded by Captain Joss, "That this meeting consider the lessees' statement, that 'no rain falls during the working months at the Kooria Mooria Islands,' is a false statement, as several falls of rain have occurred here, to the damage and detriment of all of us." Unanimously agreed to.

7. Moved by Captain Nickels, and seconded by Captain Phillips, "That the statement of the said lessees, that 'two tons per man may be dug and

loaded in one day,' is a false statement,—the fact being that no man on this island has been able to do half a ton in one day." Unanimously agreed to.

8. Moved by Mr. G. H. Brown, and seconded by Capt. Rose, "That the tenor of the statement that 'in some cases the guano may be shot from the high ground above into the vessel's hold alongside,' is calculated to mislead shipowners and merchants, as this meeting considers that no ship can lie with safety within half a mile of Jibleea."

9. Moved by Mr. G. H. Brown, and seconded by Captain Rose, "That from the misrepresentations of Messrs. Ord, Hindson, and Hayes regarding the islands, this meeting do consider that the said lessees should forfeit the amount of licence." This motion was unanimously agreed to.

10. Moved by Mr. G. H. Brown, and seconded by Capt. Stamper, "That no masters of ships here should sign bills of lading (except under protest) for any guano they may get here, as by the 9th minute of this meeting they consider that from misrepresentations the lessees have forfeited all claim to the amount of licence." This motion was unanimously agreed to.

11. "It having been understood by the merchants in England and elsewhere that there are a number of caves in the island of Jibleea containing first-rate guano,—they having been led to believe this from the statements put forward in the letters of Messrs. Stanbury and Smith, which appeared in the public journals of May 27th and July 8th, 1857, respectively,—this meeting cannot separate without expressing its conviction that the writers of the said letters are much to be censured, particularly with regard to the caves, and this meeting unanimously regrets that Captain Freemantle's report of these islands was not published much sooner, as it might have prevented many people from entering into the adventure."

The original (of which the foregoing is a copy) is signed by the following gentlemen, viz.:—Captains Wm. Stamper, D. Topping, P. Lowen, T. Nickels, J. Rose, G. Stewart, A. Davidson, J. Gibson, H. Anderson, P. Draper, J. Joss, J. Marley, H. Finlay, G. Ellery, W. M'Ellison, J. Turnbull, A. Leslie, J. Norman, J. Lindsay, J. Lucas, W. Flett, J. Morgan, R. Phillips, W. Tindal, R. S. Douglas, W. Tulloch, J. Purves, W. Williams, H. C. Evenson; George H. Brown, Agent; William Pickard, Agent.—*Glasgow Paper.*

[After this we do not expect to hear much about the Kooria Mooria Islands, and had Captain Haines's letter in our number for July last been consulted, some disappointment and much expence might have been saved.—ED.]

NEW BOOKS.

ELEMENTARY TREATISE ON SAILS AND SAIL-MAKING, *with numerous Illustrations.—By Robert Kipping.* London: C. Wilson (late Norie & Wilson), Leadenhall Street.

Mr. Kipping is evidently a practical man. There is no class of vessel afloat into the wants of which, in the subject of sails, he does not fully enter, and supplies an amount of practical information of the kind that is wanted. Whether we look into this handy little book for the construction of sails for ships, steamers, yachts, and smaller craft or boats, we find everything that can be required in the words of a practical man well accustomed with all the intricacies of his work. We commend this little volume to our readers, considering that it should be in the possession of every officer, an important part of whose duty consists in a knowledge of that practical information which it contains.

IRON SHIPBUILDING, *with Practical Illustrations.—By J. Grantham, C.E., of Liverpool.* Weale, London, 1858.

There is economy in iron even for ships, as our shipowners well know, and they are under great obligations to Mr. Grantham for inventing the proper mode of putting it together; for having found out by experience the most approved method of securing the important conditions of the greatest strength combined with economy in forming it into the huge fabric of a ship. The author of this handy little volume is entitled to the thanks of his readers for the great amount of information which he has thrown together, and also to their respect and admiration for the unassuming and business-like manner in which it is conveyed. He gives the result of his experience of some five and thirty years in all the multifarious particulars concerning the whole process of building an iron ship, as well as the tools and other necessary articles employed. And when our readers learn that this forms one of Mr. Weale's valuable rudimental series, they will see that it is, as it should be, well within their reach. We heartily commend it to their attention as the best condensed account of the rise, progress, and present state of iron shipbuilding in this country.

Sayings and Doings.

Admiralty orders have been recived at Chatham for the *North Star*, 28, and the *Rattlesnake*, 8, to be taken into dock and broken up, owing to the report of the surveyors that they are unfit for further service.

The *Enterprise*, 4, attached to the reserve, is ordered to be fitted as a coal depôt for the River Medway.

On the 10th of March Dr Livingstone and his party sailed from the Mersey in the *Pearl*. Their destination is Quillimane, at the mouth of the Zambezi, or as high above that place as the river is found to be navigable. The *Pearl*, after landing the expedition, will proceed, it is stated, to Ceylon, to be employed in the Indian Mail Service.

About fifty miles of the Atlantic Cable are coiled away on board the *Agamemnon*: the *Niagara* has arrived at Plymouth, and is about to receive her share, and in the month of June it is intended to renew the attempt of last year to place in on its final bed in the Atlantic.

THE WRECK OF THE "AVA."—Great interest is excited by the intelligence received of the wreck of the Peninsular and Oriental Company's steamer *Ava* off Trincomalee. She was an iron vessel, of 1370 tons, builders' measurement, and 320 horse-power, built by Tod and M'Gregor, of Glasgow, and launched in May, 1855. She seems to have been lost by some error in judgment on one of the outlying rocks near Pigeon Island, about twelve miles North of Trincomalee.

Sierra Leone, Feb. 11th, 1858.—Within the last ten days a very important expedition has been effected up the Scarcies River. The boats of the British squadron, and about 250 sailors and marines, under Commodore Wise, by order of the Admiralty, proceeded up the river, and made war on the Sooso Chiefs, who were about to attack Sierra Leone, and who had murdered several British subjects. The expedition was seven days absent, during which they burned all the enemy's towns, and killed between 300 and 400 of their forces.

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

MAY, 1858.

The Atlantic Cable.

Of the various projects which occupy the attention of the leading men of the day, capitalist as well as scientific, electric communication is perhaps the most important. Wherever the railroad is, there as a necessary consequence the electric wire is well established; and the obstacles of the sea against the linking together of the four quarters of the world by the mysterious chain, are happily being gradually overcome. The importance of intelligence from all parts of the world collected together at any required moment, is so prodigious that it can scarcely be overrated; and there can be little doubt that the enormous advantage which it imparts will act as a continual impetus to bring about that great achievement which shall encircle our globe with the minute pathway for the electric current prepared by mortal hands. Already is Europe connected with Africa. And although we are told by one of our leading journals that "our telegraph lines will soon be laid along the Red Sea and the shores of Arabia to Kurrachee or Bombay," had we a dash of the enterprise of our brethren of the United States, we should not have been pining as we have been through the whole Indian war for electric connection by sea with India, from whence by a few stages to some principal points across the Indian archipelago, the Australian continent will be reached. America then becomes the object from the West, as it now is from the East; and a pathway will be found hereafter across the Pacific, as it now is about to be again attempted across the Atlantic.

It is a work of peace, promising friendship and prosperity; and if science and art have combined to produce the deadly missiles of war, how much more worthily are they working together when hand in hand they are inaugurating the high road of peace and good will with their attendants commercial prosperity and friendship, by means of the electric telegraph. The subject is one of most unbounded limits: its relations to society are of an importance scarcely to be overestimated; and that on some future day this great circuit for the electric telegraph will be accomplished, is as certain as that it is already commenced. But our intention here is to confine our remarks to the Atlantic cable, by which more than half that object will be effected.

The high road selected for the bed of this cable, containing the electric wires, (we may say, for they are seven in number in close position,) has been so ably pointed out and examined by Lieutenant (now Commander) Joseph Dayman, in H.M.S. *Cyclops*, that on this score nothing remains to be done. That road is traced by the arc of a great circle as the shortest possible distance between two points on the surface of the sphere, and the depths of water upon it are so well known, that all that remains to be done is simply to follow it. It was in doing this, as our readers are aware, that the cable was unhappily broken last summer. By the sectional profile displayed on the chart constructed by Comdr. Dayman, (published by the Admiralty, Atlantic Ocean,) the greatest depth, 2,424 fathoms or nearly two sea miles and a half, occurs at about two thirds the distance across to Newfoundland. And at about 180 miles from Valentia that extraordinary drop, above a mile in depth, (from 550 to 1,750 fathoms,) is found, a feature which marks the precipitous character of the Western borders of other shores besides those of our own country. To us Lilliputians how great do these depths seem when the ocean is raging under the torture of some violent gale in all its stern reality, and yet how small are they in comparison with the vast superficial extent of surface which that ocean presents. How small a fraction is even two and a half miles of the actual distance from Ireland to Newfoundland, 1,650 miles,—a depth that would scarcely exceed the thickness of the paper on which the chart is formed,—and even if we assume it to be twice that depth, and consider it to be five miles, more perhaps than has yet been found in the Atlantic, the romantic ideas of our younger days on the unfathomable ocean all vanish before the plain truth of the matter. Much as we have done in the more important inquiry of maritime geography, we have not yet done much in this interesting subject, as is justly observed by Comdr. Dayman in his report; but we hope with him that our turn is coming, for there is a wide field to be thus explored. As far as such discovery has as yet been carried, the earth's surface at the bottom of the sea seems to partake of that undulating and sometimes precipitous character as it does where the sea is not, presenting frequently an oozy ground, and this is always highly favourable for the reception of the cable.

Our readers are aware that "on the 23rd of July (last year) H.M.S

Agamemnon, having on board 1,250 miles of cable, sailed from Greenwich, and on the 27th of the same month the U.S. frigate *Niagara*, having the remainder, amounting (inclusive of the shore ends) to 1,270 miles, left Birkenhead, each bound for their appointed rendezvous in the harbour of Queenstown, where, on the 29th of the same month, both ships had anchored, in order to afford an opportunity to test the capability of the company's arrangements for passing intelligible electric signals through the Atlantic electric wire, 2,500 miles in length. The experiments proved successful." The Directors' report in which we find the foregoing, further states, that

"The telegraphic squadron, comprising H.M.S. *Leopard*, (Captain Wainwright,) *Agamemnon*, (Mr. Noddall, Master, R.N., in command,) and *Cyclops*, Lieut.—now Commander—Joseph Dayman,) and the U.S. frigates *Niagara* and *Susquehana*, left Queenstown on the 3rd of August. At Valentia they were met by the *Cyclops*, which vessel had returned from her work of deep sounding, and on the 5th the end of the cable was landed at Ballycarberry strand from the *Niagara*, and on the 7th, after an accident to the shore end of the cable was repaired, the final departure of the squadron took place. For three days," continues the report of the engineer, "everything proceeded as satisfactorily as could be wished; the paying out machinery worked perfectly well in shallow as well as in the deepest water, and in rapid transition from one to the other; whilst the excellent adaptation of the cable in weight and proportions to the purpose, was most forcibly demonstrated by the day's work previous to the mishap, during which 118 miles of the cable were laid for 111 run by the ship."

This is perhaps one of the most satisfactory statements in the report. Up to noon of the 11th of August, the distance made good from the shore and the length of cable showed but a very few miles in excess in favour of the cable. But we will quote the few words of the engineer, by which the progress of the work of laying out the cable is shown from his report. The squadron sailed on the 7th. "By noon of the 8th," he says, "we had payed out forty miles (34·7 sea) of cable, including the heavy shore end, our exact position at this time being in lat. 51° 59′ 30″ N., long. 11° 19′ 15″ W., and the depth of water according to the soundings taken by the *Cyclops*, whose course we followed, ninety fathoms."

There will be a little confusion in respect of sea miles and those of the land, or, as they are called, statute miles; to avoid which we have annexed in parenthesis the number of the former corresponding to the latter where they appear in the report, an addition which to nautical men with the chart will be useful. After applying some additional pressure to prevent the cable from running too fast, the report continues:—

"By midnight eighty-five miles (73·8 sea miles) had been safely laid, the depth of water being a little more than 200 fathoms.

"At eight o'clock in the morning of the 9th, we had finished the

deck coil in the after part of the ship, having payed out 120 miles; (104 sea miles;) the change to the coil between decks forward was safely made.

"By noon we had laid 136 miles (118 sea miles) of cable, the *Niagara* having reached lat. 52° 11′ 40″ N., long, 13° 1′ 20″ W., and the depth of water increased to 410 fathoms."

The speed of the vessel was now raised to five knots, the men and machinery being now well acquainted,—and

"By midnight 189 miles (164·1 sea miles) of cable had been laid. At four o'clock in the morning of the 10th, the depth of water began to increase rapidly from 550 fathoms to 1,750 in a distance of eight miles. Up to this time 7 cwt. strain sufficed to keep the rate of the cable near enough to that of the ship; but, as the water deepened, the proportionate speed of the cable advanced, and it was necessary to augment the pressure by degrees, until in the depth of 1,700 fathoms the indicator showed a strain of 15 cwt., while the cable and the ship were running five and a half and five knots respectively.

"At noon on the 10th, we had payed out 255 miles (221·5 sea miles) of cable, the vessel having made 214 miles from the shore, being then in lat. 52° 27′ 50″ N., long. 16° 0′ 15″ W.; at this time we experienced an increasing swell, followed late in the day by a strong breeze.

"From this period, having reached 2,000 fathoms water, it was necessary to increase the strain to a ton, by which the rate of the cable was maintained in due proportion to that of the ship.

"At six in the evening some difficulty arose through the cable getting out of the sheaves of the paying out machine, owing to the tar and pitch hardening in the grooves, and a splice of large dimensions, passing over them. This was rectified by fixing additional guards, and softening the tar with oil.

"It was necessary to bring up the ship, holding the cable by stoppers, until it was again properly disposed round the pulleys. Some importance is due to this event, as showing that it is possible to lay to in deep water without continuing to pay out the cable,—a point on which doubts have frequently been expressed. Shortly after this the speed of the cable gained considerably upon that of the ship, and up to nine o'clock, while the rate of the latter was about three knots by the log, the cable was running out from five and a half to five and three quarter knots per hour. The strain was then raised to 25 cwt.; but the wind and sea increasing, and a current at the same time carrying the cable at an angle from the direct line of the ship's course, it was not found sufficient to check the cable, which was at midnight making two and a half knots above the speed of the ship, and sometimes imperilling the safe uncoiling in the hold.

"The retarding force was, therefore, increased at two o'clock to an amount equivalent to 30 cwt., and then again, in consequence of the speed continuing to be more than it would have been prudent to permit, to 35 cwt.

"By this the rate of the cable was brought to a little short of five knots, at which it continued steadily until 3.45, when it parted, the length payed out at that time being 380 statute miles."

The foregoing extract from the report of the Engineer supplies all the information given of the ships' proceedings from the departure up to the time when the catastrophe occurred on the morning of the 11th at 3.45 a.m. But to our nautical readers with the chart before them it is insufficient. We have therefore had recourse to the chart published by the Admiralty and a log of one of the ships composing the squadron, and have constructed the following tabulated statement, which will afford some further particulars that may be useful in discussing the subject. They are no more than nautical facts, as near the truth as such facts can be obtained, and are looked for by nautical men as a kind of professional routine, in the case before us showing the progress of the Atlantic Telegraph squadron.

Tabulated Statement.

Noon of	Course made good.	Dist. run.	Lat. in.	Lon. in.	Miles from land.	Miles of cable veered	Depth of water.	Pressure on cable.	Wind.		Current.	
									From	Frc.	Set.	Mls.
	°	miles	° ′	° ′			fathoms.	cwts.				
August 8	N. 88 W.	34	51 59	11 19	32	34·7	90	7	N.N.E.	3		
9	N. 80 W.	64	52 12	13 1	96	118·0	410	7	S.W.	4	West.	14
10	N. 83 W.	112	52 28	16 0	214	221·5	over 1750	15	W.N.W.	4	N. 30° W.	7
at 3.45 a.m. of 11	N. 81 W.	60	52 37	17 38	267	329	1950	35	W.N.W.	5	N. 32 W.*	*9·5

We have now before us several particulars to which we may freely allude. We see the position of the ship at noon of each day, the course and distance run from noon to noon up to the time of the accident, the distance actually attained from the shore, besides the length of cable out and other particulars for consideration.

The great work in hand, that of laying the cable, seems to have been commenced at least under auspicious circumstances. There was a light wind from the northward, even with some easting in it, the sea was smooth, and from the time that the ships were fairly clear of the land until the evening of the unfortunate night of the 10th everything was working well. The men were becoming familiar with their new duties. The heavier shore end of the cable was first paid over at the rate of 3 knots per hour; as this was disposed of and the water became deeper, the speed was accelerated to 5 knots; and on the noon of the 10th the amount of cable expended (or shall we say laid out) only exceeded the distance from the land by 7·5 miles, or a little more than 3 per cent,—a rate of excess for which there was ample cable provided in the ships.

The report tells us there were 1,270 miles on board the *Niagara* and 1,250 in the *Agamemnon*, making 2,520, which, as statute miles,

* By log at noon of 11th.

are equal to 2,188 sea miles, while the actual distance on the arc of the great circle is not more than 1,650. Thus, at noon on the 10th, 214 miles being laid, reduced the amount left in the ships to 1,974 sea miles, to cover 1,436; which at an excess of 3 per cent would have left 495 miles of cable on board, had the paying out been preserved at the rate at which it had been commenced.

This was, however, too good to last, and, like many other first attempts at great deeds, that magnificent one of laying an electric wire across a sea of 1,650 miles, and at little more than 2 miles in depth, was not to escape its difficulties.

The first indication of trouble appears in the Engineer's report on the afternoon of the 10th, when he says, "we experienced an increasing swell, followed late in the day by a strong breeze," and as the ships were steaming against this breeze, the effect of it was increased, and matters soon became worse. The cable, by some accident, common enough with a ship in constant motion, got "out of the sheaves of the paying out machine;" to rectify which it was necessary to stop her way through the water, and hold the cable while it was done. The Engineer seems to attach importance to this, and had the ship been *riding* by the cable or pulling against it forcibly, this might have been justifiable. But in a nautical point of view, a certain quantity of cable was hanging to the ship, while she was drifting *with it*;—and as the cable was strong enough to hold four miles of its own weight out of the water, a much greater quantity than that, lessened by its loss of weight in the water, would not have broken it.

But trouble seldom comes single, it is said, and so it proved with the cable. The breeze freshens, the sea gets up, and the progress of the ship is checked from 5 to 3 knots as midnight approaches, and the current brings the cable to an inconvenient angle with the ship's wake, while it requires to be veered even to 5¾ knots per hour, as the ship is plunging against the sea at the miserable rate of 3 knots, leaving the cable in a most uncomfortable and unsatisfactory manner, and causing great uneasiness to the Engineer. Things went on thus until two o'clock, the checking power over the cable having been increased to 25 cwt.; at two it was increased to 30 cwt., and as the cable still insisted on escaping at an imprudent rate, 35 cwt. was made to check it, which after bearing for something less than two hours, it would stand it no longer, and parted.

It would have been a matter for surprise if it had not done so, for the cable was fairly on the ground and the ship was by her slow progress left so much more to the effects of the current, which by the table it seems would be setting her to the N.W., leaving the cable on the port quarter. Here, indeed, was an unfortunate state of affairs. The ship's progress through the water was comparatively paralysed; and the Engineer shows that 109 miles of cable had actually been veered since the preceding noon, while the greatest distance that could be allowed that the ship had made good amounted to not more than 60 miles. There was no doubt a heavy sea on, rendering the management of the cable most difficult and requiring a *seaman's ex-*

perience, especially as the current was setting the ship across her course. But currents are mysterious subjects to deal with, and we have no desire to pursue this further, although the log of the ship does not show it to have been anything more than one of a very moderate kind.

In reference to the increasing sea alluded to by the Engineer, the real source of mischief and which with the current caused the disaster, those who have doubled the Cape may have noticed the same effect in going from the bank to deep water. It is so well pointed out in one of the volumes of this work that it may be worth while to quote the observation here. The writer, after alluding to the faithful indications of the barometer, says,—

"But there is yet another phenomenon which is worthy of attention on this coast, and which does not appear to have been sufficiently noticed. It is the remarkable difference between the surface of the sea during and after a gale of wind off the Agulhas Bank and that upon it. Three times during the gale did we enter from deep water to soundings on the bank, and both in leaving it and going on to it did we experience this most remarkable change. While in deep water we were exposed to the most turbulent and irregular seas imaginable, some apparently rising close to and breaking almost over our ship, and at such moments many an anxious look was cast towards the boats and spars. But no sooner did we find soundings with 60 to 75 fathoms, than we were in a sea comparatively so tranquil as to be enjoyed and appreciated by all hands."

The plain remedy which this state of things at once suggests is to get out of it as fast as possible, and as there is a great similarity of condition in the *Niagara* being just off the bank, in deep water of 2,000 fathoms, where this ship realized the same turbulent sea as the other did off the Cape, although not to the extent that would be produced by a gale of wind, her course would have been to have done so. But this she could not do. Her duty was to persevere to the westward against wind and sea, as well as she could. Nothing else was left to her, and persevere she did to the breaking of the cable after the expenditure abovementioned.

It is now several years since we suggested to the late Admiral Beechey, when the project of the Atlantic Cable was in embryo, to commence laying it down from the midway point between the two lands, an opinion in which he at once coincided, and it was with no small regret that we found that method was not to be adopted in the present case. The advantages we consider to be—1. A saving of half the time by the ships laying out the eastern and western halves of the cable at the same time. 2. The prevailing S.W. wind being in favour of the eastern ship and enabling her to choose her rate of progress as she goes eastward, even to drifting with a gale and laying her head to the northward or southward, as required to keep on the arc, instead of plunging against it; while as the western ship advances westward she will reach a smoother sea even with a foul wind. 3. Both ships shoaling their water as they approach the land, and the strain on the

cable thereby becoming less. These are the principal advantages, and while the chance of meeting westerly winds, with a troublesome sea, is so much increased by the time being doubled when starting from the eastern end, the only one gained by starting from it is that of recovering the cable if broken. Let us hope this may not be necessary. The ship with the western half will have the easiest task, unless fog and adverse gales prevail there, for one-third of her distance is under the depth of 1,500 fathoms, while four-fifths of the eastern half is over that depth. It is with great satisfaction, therefore, that we find amongst the resolutions of the Directors' report the 5th, which says, "that although on the present occasion [alluding to that under consideration] the commencement of operations at the coast has been attended with some advantage, it will in future be desirable to begin paying out the cable in mid-ocean." The cable has been pronounced by the Directors as fit for the object in view, and they consider it will be desirable to join the cable in mid-ocean, instead of starting from either shore.

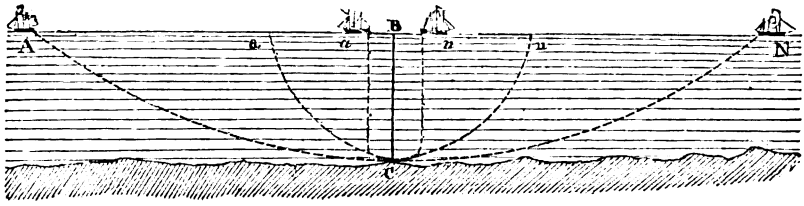
In this view of the subject Commander Dayman also coincides. He says, "I am in favour of the start from the centre, because the splice can be at once satisfactorily made without risk to the cable, and the operation of laying it halved in point of time, which is a great consideration," * and he further observes that "in forcing the paying out vessel against a strong wind and high sea, even at very low speed, the jerking motion must necessarily be very great and the risk to the cable in proportion," especially, we may add, when a current is setting the ship with the cable, as it did last summer, across her course.

The point, however, has been wisely decided, and we will consider the ships with the cable on board as arrived at the half-way station, which will be in about lat. 52¼°, long. 32½°, by the early part of June next. . If the weather should then prove unfavourable, they may lay by for moderate, or a calm would indeed be most propitious. Then may the interesting operation of uniting the two ends of the cable take place. Shall it be performed in either ship by previous arrangement?—a toss up would decide which shall have the honour—or shall it be performed in a boat between them? But once done, say at the point B, the ships will each pay over sufficient cable, above two miles, to allow it to take the bottom at C, and by the time it is veered they may have assumed the positions *a* and *n*, with the cable hanging between them, the bend resting on the ground. Such an event will no doubt be celebrated in the whole squadron, and success to the interesting voyage which each ship will have before her, will no doubt be remembered in a parting libation, (such as have been on many a less important occasion,) when they will turn their heads from each other, and gradually and slowly increase their distance apart, each

* *Deep Sea Soundings in the North Atlantic Ocean between Ireland and Newfoundland: made in H.M.S. Cyclops, Lieut.-Commander Joseph Dayman, in June and July*, 1857. Potter, Poultry.

ship veering plentifully of the cable as she progresses on her assigned course and accelerates her speed.

A, a, *a*, Agamemnon. *n*, n, N, Niagara.



Now admitting here that the depth is about two miles, and that no current influences the cable, it will then assume what is known by mathematicians as the catenary curve; and admitting also that it takes the ground at the distance of six miles from the ship, the weight of the cable being 18 cwt. per mile, the strain on the end of the cable in the ship is to be arrived at by a process of the highest order in mathematics. But allowing it to be laid out at so little as the rate of three knots per hour, (for the faster it escapes the less will be the strain,) we believe it will have a strain which it is well able to support, and a week or eight days might see the object accomplished.

Perhaps this is a state of things too good to contemplate. Therefore let us admit that the old enemy a S.W. gale springs up a day or two after starting,—a circumstance certainly not likely. The Western ship would have wind and sea on her port bow, and under snug canvas would come to little harm. She would make Northerly drift perhaps,—but she would make up for that by occasionally laying her head to the Southward. But the wind is notoriously unsteady, and by its hauling Northward of West or even N.W., she might make way on her course and after all lose no great deal. But what is the Eastern ship about? She has got a fair wind, and has nothing to do but to regulate her speed according to her power of paying out the cable. She need not go more than five knots, but she may if she pleases and can veer with safety to the cable; while she may reduce her canvas and lie a hull, drifting only to North or South as she may choose to place her head to keep herself on the arc of the great circle. And should such weather continue to the land, should she bring it home with her, as ships full often do, there are various means of parting with the end of the cable by giving it to a smart little steamer that can keep the sea, as well as her place in it, until the weather admits of landing it.

But let us not anticipate the worst side of the picture such as is here drawn, for we cannot admit of breaking the cable, and yet we must still expect the mysterious phenomena of currents to take their share of the work. In reference to the mere depth of the sea, that may be considered a kind of superficial covering where it exists on the earth's surface; but currents we look upon as still more superficial, a drift of the surface waters acted upon by some passing current of the

atmosphere, or one that has passed over them, obtaining effect from superincumbent pressure. In the case before us we have however to deal with *bona fide* currents, whether of the whole depth of water or not it matters little, for the cable is to lie on the ground, and whether the lower depths of the water are in motion does not signify, although this is perhaps seldom the case.

In the case of the Eastern ship, a surface drift of a mile an hour to the Eastward would most likely have to be allowed, and cable given accordingly. But the Western ship would most probably experience a few miles of Southerly current each day; the same which brings the ice in berg and field from the shores of Greenland and Davis Strait. Still neither from these nor from currents do we anticipate for a moment any difficulty. As soon as a field of ice or a berg is seen, which will be from the mast-head, should they drift in the way measures will be adopted either to pass round to windward of it, or to let it pass by to leeward. And in respect of currents in the presence of ice or not, the same judgment and discretion which has carried ships free of all danger, that have been less completely armed with the resources of steam and sail, and the powers of managing both, will crown the efforts of those who will then be charged with the safe delivery of the electric cable.

It was very justly observed by the Directors in their report, made on the 18th of February last, to the first ordinary meeting of the Company, that it seemed as if "the Atlantic Telegraph, in common with nearly every other undertaking of great and original conception, should have to obtain from temporary disappointment the knowledge that leads to success; and the Directors, so far from desponding on account of what they regard as a mere temporary and accidental impediment, have every reason to hope and believe that this enterprise is now on a surer basis than ever, and that a right use of the experience gained in August last will lead to complete success in the summer of 1858." At that meeting it was stated that "every effort has been made and is being made by the Board to profit by the knowledge we have obtained. The engineer has been placed in authorized communication with gentlemen of the very highest mechanical skill and reputation. Experiments are in progress with various forms of apparatus for paying out, with the view to simplify every part, and to render it as self-acting as is practicable."

In common with every one we hope and believe these efforts will be successful. As seamen we know the undertaking can be accomplished, and one word only we may be allowed to contribute to the work in hand that we trust will not be lost. That charming poet, Longfellow, says somewhere—

> "Wouldst thou," so the helmsman answered,
> "Learn the secret of the sea,
> Only those who brave its dangers
> Comprehend its mystery."

There is mystery even in the movements of a ship; but the seaman

full well knows it. He habitually prepares himself for that peculiar movement which he knows will assuredly follow any other before it comes. And even this is one of those "secrets of the sea" which the landsman does not know. Therefore, earnestly desiring as we do to see the work of laying the Atlantic Cable successfully accomplished, we say always—"Let the seaman do the seaman's duty."

CAY WEST AND FLORIDA WRECKERS.—*An Extract.*

Key West is about four miles long from N.E. to S.W., with an average width of about three quarters of a mile. The foundation of the island is a species of limestone, overlaid by pulverized coral, resembling white sand. The island is covered with a thick growth of bushes, plentifully interspersed with the prickly pear and wild tobacco; while in the city are found cocoanut, pineapple, chaffarel, tamarind, and many other beautiful trees. In the gardens, many of which are very beautiful, you may pluck oranges, lemons, limes, pomegranates, bananas, grapes, guavas, figs, almonds, and almost every specimen of tropical fruit, while the most brilliant flowers gladden the eye, and spread their grateful perfume on the air. The splendid cocoanut tree waves its feather-like branches, the rustling of which, when agitated by the wind, sounded so like rain, that the night of my landing here, hearing the noise, I arose, half asleep, to close the window, and was only undeceived by finding the moon shining brightly, and one of these trees nodding against the side of the house. Key West is not mountainous, the highest point being about fifteen feet above the level of the sea, and some parts are considerably below the level, especially towards the N.E. extremity, where are situated large ponds for the collection of salt, sixty thousand bushels of which article are stored here at the present time.

The city of Key West is situated upon the S.W. portion of the island—is laid out with considerable regularity, and contains about 2,500 inhabitants,—the whole population of the Key amounting to about 3,500; all of whom of course obtain their livelihood, either directly or indirectly, by wrecking, as that is the only business which brings any capital to the island, nothing being produced here for export with the exception of salt and Sisal hemp, and these are only manufactured by one person. There are several large stores here for the sale of all kinds of merchandise, and some very extensive ship-chandleries. Ship-building is carried on to quite a considerable extent,—a ship of over a thousand tons burden (the *S. R. Mallory*) having been launched during the past summer. She was built by a man who had never seen a ship built in his life, and, I am informed by those who saw her, is a triumph of naval architecture. Two beautiful schooners have been launched since I arrived. We have four churches,

Baptist, Methodist, Episcopal, and Catholic; all of which are well attended, as are also the schools, several of which are to be found here.

And now as to that horrid bugbear which has frightened so many, myself among the number. The prevalent and general opinion is that the wreckers are a parcel of lawless, piratical scoundrels, who will allow nothing, not even human life, to stand between them and their booty. Why, how often have I heard and read of their cutting off fingers for valuable rings, or drawing a knife across a man's throat if he objected to their relieving him of his property? But how different is the reality to this long-swallowed romance.

Suppose a ship in transit from New Orleans to Liverpool, through erroneous reckoning or bad weather, gets upon any of the reefs or keys which are so numerous between here and the coast of Florida. The wreckers, whose vessels are cruising about, find her, repair damages as far as possible, and carry her into Key West. If she be too badly hurt they take out as much cargo as they can and strip her, and take their load and the passengers or crew in here, where everything is placed in charge of the United States Marshal and the Agent of the Board of Underwriters. The cargo, if damaged, is sold at auction, and proceeds (after deducting salvage) distributed among the several offices in which the vessel is insured. The amount of salvage to which the wreckers are entitled for their services is decided by a United States Judge of Admiralty, who is always here, and before whom all cases must be adjudicated. This salvage is divided *pro rata* among the wrecking vessels according to tonnage and number of crew.

If, instead of being cast-away, a ship should be disabled by losing masts, &c., she simply pays those who pilot or tow her into port, and this amount is also decided by the Judge, unless the parties arrange matters by themselves without submitting it to adjudication.

The wreckers, who are generally orderly, well disposed people, live here with their families, and are as quiet, honest, and hospitable as the same number of farmers would be. They are mostly natives of the Bahamas, and of English descent. In fact, the majority of the inhabitants are Bahamians, or "Conchs," as they are christened here.

But the climate here is the great point of interest to strangers, as those who visit here generally come for health. It is now near the middle of December, and the weather is as warm as we generally find it at the North in midsummer. The prevailing wind here is the N.E., although it is continually changing about from one point of the compass to another. Sometimes the wind is South, when it is very hot and sultry. In the summer this South wind is regarded as unhealthy. The "Northers" that visit this neighbourhood during the winter months are frequently cold enough to require fires, but they occur but seldom—perhaps half a dozen times during the winter. Since our arrival the wind has blown from the North frequently, but never cold or hard enough to be dignified by the name of a regular Norther. The last blow we had from that direction was about two weeks ago, and lasted three days. If it had been blowing in from the open sea

it would doubtless have been grand; but as the water in that direction is pretty well filled up with small islands, scattered about, the roll of the sea, consequent upon a heavy wind, is pretty well cut to pieces. Should a gale blow from the southward across the Gulf of Mexico, it would doubtless kick up "quite a bobbery."

For persons affected with pulmonary or bronchial complaints this is the place. I have seen those here who came out to die—so ill were they, who are now as hearty and robust as I am, and that is very healthy. I get no commission from any hotel-keeper for this puff, as there are no hotels here; but very good accommodation can be found in many private families, and, moreover, the society here is very good; indeed, there are very many agreeable and pleasant folks, and all one requires is to make up his mind that he will have a good time, and he will have it.

Key West, January 10th, 1858.

We to-day forward you for publication a correct list of vessels meeting with accidents in this wrecking district during the year ending December 31st, 1857. This list includes those totally lost either on the reef or in the gulf, those sprung a leak at sea and seeking this port for repairs, and those brought in by the wreckers from the shoals of the coast.

The number of accidents, according to our list, is 59: of which 9 were totally lost—3 of them were destroyed by fire; 1 condemned and burned, being unworthy of repair; 4 dismasted in gales of wind and brought to this port and refitted; 1 blown from the latitude of Cape Henry to this place, the first port she could make; 1 shifted cargo; 1 with a mutinous crew; 16 leaking and unable to proceed; 1 leaking, supplied with steam pumps and proceeded without repairs; 19 received assistance from the wreckers, and paid pilotage or salvage; 5 got ashore and succeeded in getting afloat without aid; 1 foundered at sea; and 1 (steamer) arrived with machinery out of order, and needing new boilers.

The value of these vessels was 825,500 dollars, and that of their cargoes 1,807,950 dollars. The repairs of the vessels arriving in distress and the expenses attending those brought in by the wreckers amounted to 79,882·35 dollars. The sales of damaged cargoes and condemned materials and stores, amounted to 56,962·51 dollars. The salvage paid by the Admiralty Court was 99,657·43 dollars. The total salvage paid by court, by mutual agreement, and by arbitration amounted to 101,890·57. The salvage and expenses were 172,984·44 dollars.

The classification of vessels is as follows: steamers, 1; ships, 10; barques, 7; brigs, 9; schooners, 32. Total, 59.

We annex the wrecking returns for 1854–5–6. In 1854, the number of accidents was 64; in 1855, the number was 80; and in 1856, 71.

Value of vessels and cargoes in distress or wrecked in 1854 .. 2,242,454 doll.
" " " " 1855 .. 2,844,077 "
" " " " 1856 .. 4,747,264 "
" " " " 1857 .. 2,663,450 "

12,497,241 doll.

During the fourteen years preceding 1858, the following detailed statement exhibits the number of vessels and cargoes, salvage decreed, and total expenses incurred on said vessels and cargoes putting into this port in a disabled condition.

Year.	Number of vessels	Salvage.	Expenses.	Value of vessels and cargoes.
		dollars.	dollars.	dollars.
1844	29	93,712	169,065	725,000
1845	26	69,592	105,709	737,000
1846	56	122,892	231,423	1,597,600
1847	37	109 000	200,000	1,624,000
1848	42	125,800	206,500	1,282,000
1849	47	127,870	219,160	1,305,000
1850	30	122,831	200,860	929,800
1851	34	75,852	165,085	941,500
1852	23	80,112	163,000	675,000
1853	57	174,350	230,100	1,973,000
1854	64	88,940	166,365	2,314,000
1855	80	100,495	189,800	2,844,077
1856	71	163,117	262,644	4,747,600
1857	59	101,890	172,984	2,663,450
Total	655	1,556,453	2,683,295	24,359,027

The value of property jeopardized last year was nearly four-fold that of 1844, and that of 1856 and 1857 equal to that of the years 1844–5–6–7–8–9 together—showing conclusively that the Florida wreckers are still important assistants to the commerce of the great gulf. The increase in the number of beacons, reef-signals, buoys, and lighthouses, and the adoption of expensive illuminating apparatus does not seem to lessen the number of accidents to vessels passing through the Florida Straits. Yet there is no doubt but that the average number of accidents to the amount of shipping now passing is less than in former years, when the lights and signals did not exist.

Charleston Courier.

On the Progress of the English Lighthouse System.—*By A. G. Findlay.*

The period which has elapsed since the completion of the Great Skerryvore Light by Alan Stevenson to the present time has not been unimportant, either in the improvements of lighthouses, or, what is of more consequence, their requirements. It is proposed to treat of both these topics in the present paper. But before entering into the details of either of these two branches of our subject, some brief account may be necessary of the main facts concerning pharology.

First as to the illumination. There are two systems now employed; the older one of lamps with metallic reflectors placed behind the light, the catoptric, or as it may be called the English system, and the other where the light is controlled by lenses placed before it, or the dioptric, known as the Fresnel or lenticular system, which was first brought into general use in France.

The merit of priority in the former undoubtedly belongs to England. Polished metallic reflectors were invented in England, and first used at the Liverpool lighthouses. Of late the credit of the invention has been given to Chevalier Borda, who, with the assistance of M. Lenoir, constructed some reflectors of silvered copper for the famous Cordouan lighthouse, off the mouth of the Gironde, in the year 1780.

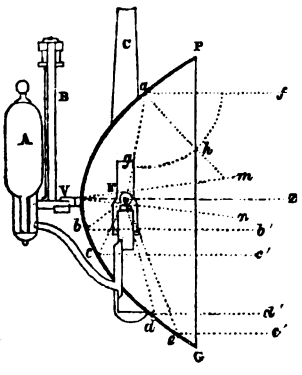
M. de Teulère, a member of the Royal Corps of Engineers of Bridges and Roads in France, has also been considered by some as the first to have directed attention to the utility of paraboloidal reflectors, and is said to have proposed a revolving reflector light for the Cordouan, in 1783. But in re-affirming the statement made on pages 287 and 288 of the *Proceedings of the Society*, before referred to, that William Hutchinson, mariner and dockmaster of Liverpool, invented and used metallic reflectors at that port prior to 1777, and most probably in 1763, an anecdote which I have met with adds to the certainty of the early date of the invention.

It is stated that William Hutchinson, in the year 1763, laid a wager, which he won, that he would read from a book, at the distance of 200 feet, by the light of a farthing candle. He did this with the aid of one of the Liverpool lighthouse reflectors.

The reflectors used in the Liverpool lighthouses at the period alluded to, were formed on a parabolic curve of 1, 2, and 3 feet focus, and 3, 5½, 7½, and 12 feet in diameter, the smaller ones of tin plates soldered together, and the larger of wood, covered with looking-glass. The lamps consisted of flat wicks of from 3 to 14 inches broad, the supply of oil being kept uniform by a dripping-pot behind the reflector, as shown in the diagram. These and more perfect reflectors are described in Hutchinson's excellent work entitled *A Treatise on Practical Seamanship*, and published in 1777. Mr. A. Stevenson, quoting a second edition of the same work, published in 1791, under a different title, running thus: *A Treatise, &c., on the Best Form of Merchant Ships, &c.*, has been led to give the priority to the French.

The next advance in the economising of light was that made by Mr. Thomas Smith, the engineer to the Scottish Lighthouse Board, who, in 1786, introduced the reflector which I have. It is formed of a hollow paraboloidal mould of plaster, lined with facets of mirror glass. Mr. Smith originated this idea himself, without being aware of what had been done at Liverpool and in France previously. These contrivances were in use prior to Argand's invention of the tubular wicked lamp, which was a great step in the art of illumination. The first polished metal reflectors used in Great Britain, were placed in the Inch Keith lighthouse in 1803.

As far as the principle is concerned, the catoptric system was perfect when Captain Huddart determined the best form for the parabolic curve of these reflectors, and his principle is still in use. To clearly understand the action of these reflectors, a reference to the diagram will be sufficient; it will be seen that the form of the curve is such that, a line or ray from the focus striking any point of the inner face of the parabola, will do so at the same angle as that of a horizontal ray reflected from that point; therefore all rays of light, so reflected, will pass off in a horizontal direction; and, supposing that the light was a single point, the reflector would send forth a cylinder of rays equal in diameter to its double ordinate, or the diameter of its mouth, consequently it would be impossible to show a light all round the horizon with any number of such instruments; but, as the flame of the lamp is about one inch in diameter, this subtends an angle of 14° 22′, at the vertex of the parabola, of 4 inches focus, (the usual size of lighthouse reflectors); this, with other circumstances, makes it necessary to use from 25 to 33 such reflectors to form a complete zone of light.*

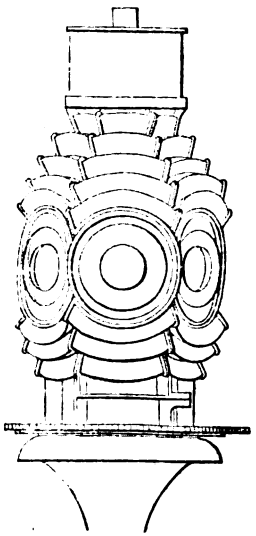


* P V G is a vertical section of a reflector; F the focus and situation of the flame of the lamp; A the oil fountain; C the ventilating tube. The angle of incidence being equal to the angle of reflection, the angle V *a g* at which the ray F *g a* falls on the surface of the parabola at the point *a* is equal to the angle P *a f*, at which it is reflected from the surface; therefore the angle made by the ray falling on, and being reflected from, the surface, will be bisected or divided into two equal parts by the perpendicular to the tangent of the parabola at the point of incidence, therefore the angle *g a f* is bisected by *g h m*, that is, the angle *g a h* is equal to the angle *h a f*. The peculiar property of the parabolic curve is that the ray, when reflected from any point, is always thrown in a direction parallel to the axis of the curve; that is, the direction *a f* of the reflected ray is parallel to the axis F Z. Thus a copper reflector, lined with highly polished silver, formed to such a curve, with a mathematical point of light placed in its focus, as F, will reflect the rays from it in straight lines, parallel with its axis V Z, as F *b b'*, F *c c'*, F *e e'*, &c., and

The catoptric system is still in use in the majority of our lighthouses, as it possesses some advantages over the dioptric system, as will be seen presently.

The dioptric or lenticular system, like that of the reflectors, has arisen, step by step, to its present condition. The great size which a lens must be to control any great volume of light, would require such a mass of material that many conditions render the ordinary convex lens inapplicable to the purpose. The general plan of the lens as now used, was suggested as a good form of burning glass by Buffon, in 1773. For lighthouse purposes the form now applied was first proposed in Britain, by Sir David Brewster, in 1811, who showed that a lens might be built up of separate pieces to any size. Previous to this, in 1780, the Abbé Rochon ground down a light piece of glass to concentric rings, and a similar lens was made by Messrs Cookson, of Newcastle-upon-Tyne, for the Northern Lighthouse Board. The great trouble and difficulty attending the construction of such lenses precluded their general use.

In the year 1819, M. Augustin Fresnel, without knowing what Sir David Brewster had done in England, proposed a polyzonal lens of the same character, and afterwards, in conjunction with MM. Arago and Mathieu, applied the system to the Cordouan lighthouse. The new apparatus was first shown on July 23rd, 1823. M. Augustin Fresnel subsequently made the system much more perfect, and hence it is generally called by his name.



The lenticular apparatus is placed around the single central lamp, as shown in the example I am enabled to exhibit. The arrangement of glass is so constructed as to refract the rays emitted from the lamp in the focus of the apparatus in every direction, into beams parallel with the horizon.

This apparatus is a holophotal fourth-order lens, showing a revolving light. The oil reservoir is placed over the apparatus, which consists of six polyzonal lenses around the flame of the lamp, above each of which are six portions of catadioptric rings, which are made concentric with the central portion, below which are three central rings. On the revolution of this machine each face sends forth a flash of nearly the whole light emitted by the lamp. I am indebted to Messrs. Wilkins and Co. for the opportunity of showing this apparatus.

It will be readily understood, that for an instrument of this character to perform its

thus send forth a cylinder of light, whose diameter is equal to the double ordinate of the reflector, P G.

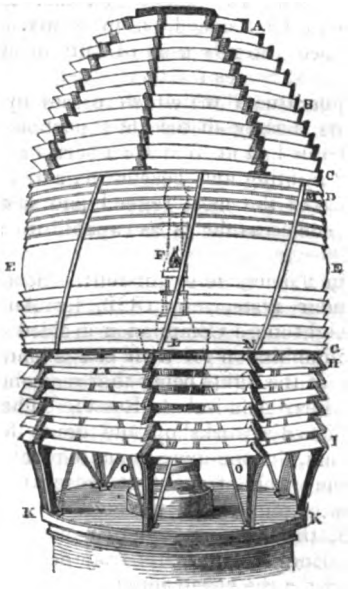
office, many conditions are necessary, first the glass, which is used in such large masses, must possess perfect homogeneity; it must possess great transparency, and its figure must be formed with great accuracy to ensure successful operation. Its action may be briefly explained as follows, assisted by the illustrative diagram. A plano-convex lens of 30 inches diameter, as required in a first-order apparatus, would, if not formed on the polyzonal principle, be above 11 inches in thickness in the middle, a condition manifestly impracticable. The convex surface of the lens is, therefore, supposed to be cut into circular zones of triangular section, so that all the solid portion of the lens is dispensed with; these sectional zones are then arranged on one plane, and have the same refractive properties as if they were one solid piece, because the two surfaces are of the same relative figure.

For a revolving light, the lenses of the central portion of the apparatus are arranged into an octangular prism which in the largest or first-order light is 6 feet $\frac{1}{20}$ inch in diameter. For a fixed light the central part of the apparatus is formed of a band of lenses whose section is determined by the horizontal revolution of the figure of the polyzonal lens. This portion of a first-order light economises rather more than one-fourth of the whole light emitted by the lamp in its focus, or 92 deg. At first it was thought impossible to construct this central drum or belt of a circular form, and it was then made a polygon of thirty-two sides, but Messrs. Cookson, in 1836, constructed a circular one, which greatly increased the power and utility of the apparatus.

To control that portion of the emitted light which passes upwards over this central belt, and amounts to three-eighths of the whole quantity, the plan first adopted by Fresnel, was to place a series of small mirrors disposed in seven tiers gradually decreasing in diameter, forming a species of cupola above the central belt. These mirrors, strictly speaking, would be portions of such parabolas as would, if carried around the focus, form perfect reflectors, as may be comprehended from the diagram. In practice, however, owing to the breadth of the flame, they were formed of silvered plate glass, inserted into small brass frames, and suspended by screws at the back to an iron frame work. In revolving as well as fixed lights, this portion of the apparatus is fixed, and gives the continuous light visible between the flashes of a revolving light, which flashes are produced by making the eight polyzonal lenses revolve in a regular interval, and by this means the rays from the lamp being directed in eight directions, cause a bright flash to appear to the distant observer at intervals of one-eighth of the period occupied by the revolution of the entire apparatus.

The portion of light which escapes below this central belt was also economised by the same means; that is, four tiers of these mirrors were placed below, of equal diameter with the whole apparatus, and were constructed on the same principle. These arrangements affect about four-fifths of the entire amount of light, but in doing this there is the great loss caused by the absorption of light by metallic specula, which perhaps amounts to one-half of the whole incident light.

This last consideration led M. Fresnel to construct his small dioptric apparatus, with refracting and totally reflecting glass zones above and below the principal portion. The action of these zones may be familiarised by the use of the ordinary prism, which refracts the incident ray in one direction, and if it receives it on the inner surface of the opposite side at a greater angle than about 41° 49′, the ray is totally reflected, and ultimately emerges from the prism in a horizontal direction, the only loss of light being caused by the absorption by the glass. The first application of this principle on a large scale is due to the suggestions and calculations of Mr. Alan Stevenson, and it was first introduced in the noble Skerryvore light, which was completed on December 23rd, 1843, by M. François Soleil. "Nothing can be more beautiful," says Mr. Alan Stevenson, "than an entire apparatus for a fixed light of the first order. It consists of a central belt of refractors, forming a hollow cylinder, 6 feet in diameter and 30 inches high; below it are six triangular rings of glass ranged in a cylindrical form, and above a crown of thirteen rings of glass, forming by their union a hollow cage composed of polished glass, 10 feet high and 6 feet in diameter. I know of no work of art more beautiful or creditable to the boldness, ardour, intelligence, and zeal of the artist."



View of a first-order *fixed* dioptric light.—F, the focus, or flame; L, the lamp; D, E, E, G, the central belt of refractors; M, N, diagonal brass frames to panels of central refractors; H, I, six lower catadroptric zones; A, B, C, thirteen upper catadroptric zones; O, O, diagonal legs; K, K, service table.

Such is the general arrangement and operation of the apparatus for a large lighthouse showing a fixed light. For a revolving light, such as the Skerryvore and the Cordouan, a different arrangement is adopted,

which, as it is only a modificaton of those above described, and as most persons are familiar with the fine examples of this apparatus exhibited in our own Exhibition of 1851, and in the later French Exposition, it need not be dwelt on now.

There is an arrangement of the lenticular apparatus which, at the period of my former paper, was not in use in our English system, although generally adopted in France and elsewhere. It is for the purpose of showing a fixed light, varied by a flash, preceded and followed by short eclipses *(feu fixe varié par des éclats)*. It consists of a supplementary system to the ordinary lenses for a fixed light, which as I have been describing, distributes its light evenly all around the horizon in a belt equal to the height of the apparatus, increased by its slight powers of vertical divergence. Around this apparatus, consisting of horizontal cylindrical elements, two or four panels of lenses, composed of vertical cylindrical elements, or at right angles to the main apparatus, are made to revolve. The effect of this additional arrangement is to cause those horizontally divergent beams which fall on the inner surface, to become parallelised, and thus reach the observer in the form of a flash, which is preceded and followed by a short eclipse, due to the angle between the parallelised and divergent beams. This, though a beautiful arrangement, has some drawbacks in the absorption of the light through the double apparatus. The effect, moreover, is open to some objection, which will be touched on presently. This form of lenticular apparatus has been largely used of late in the new lighthouses constructed by the United States for their coasts.

Of the seventeen dioptric apparatuses which were employed in British lighthouses ten years since, nearly all the glass portions were of French construction. Our shores had at that time been furnished with almost a complete system of lighting and beaconage, and the apparatus of the catoptric class was of the most refined and beautiful description, perfectly fulfilling its office as far as its capabilities would allow it.

The conditions of pharology in France were different. Soon after the establishment of the lenticular system, in 1822, by Augustin Fresnel—that is, in 1825—the Lighthouse Commission decided on the exclusive use of that system of illumination for their coasts and those of their colonies; the distribution of the lights being that recommended in the programme and report of Rear-Admiral de Rossel. The Central Commission at Paris established a workshop and depôt for the construction of the apparatus, and, in the twenty subsequent years, they supplied not only nearly the whole of the first-order apparatus for their own coasts, but also a large number for the neighbouring governments. During this period, the fiscal regulations embarrassing the glass manufacture precluded English enterprise from dealing with the large masses of metal required for the construction of these lenses. Besides this, the material procurable near Paris is so superior to any of a similar kind that is attainable from our own country, that it is another reason why our French neighbours took the precedence of us in this branch of scientific art; and thus a large proportion of the

principal light apparatus, on a large scale, necessary for the safety of the mariner, had been erected before the removal of the excise duty on glass.

Without pursuing this part of the subject into its details, it will suffice here to state that the foregoing embraces the general principles of lighthouse apparatus as in use in 1847. The minor features, in their great variety, may be followed in the excellent works of Mr. Alan Stevenson and M. Fresnel.

In instituting a comparison of the efficiency and economy of the two systems,—a question which has been strongly discussed,—many points have to be considered. It has been usual with many to give the superiority, on both heads, to the dioptric system; but there are numerous conditions under which it can be demonstrated that the authorities of our Trinity Board have acted quite wisely in retaining the reflector system, under which so many of our fine lighthouses have been established. A few words on the peculiar properties of each will be sufficient now. The discussions involving a large mass of calculations, are extant elsewhere.

The effect of a paraboloidal reflector of 21 inches diameter and 4 inches focus, when viewed directly in front of the flame of the lamp, one inch in diameter, is equal to 270 flames; at a divergence of 7 degrees from the axis, about 44 flames; and between 9 and 10 degrees of divergence from the axis it is 2 flames. The diagram above will illustrate this distribution of the light. The available or useful amount of divergence altogether is about 15 or 17 degrees, the actual amount from such a flame is 14 deg. 22 min. Vertically, the divergence is about 16 deg. 8 min., or it will be serviceable to 20 degrees. This is a useful property, as will be seen presently. It will, therefore, take from 25 to 33 such reflectors to form a complete circle of useful light. But this cannot be evenly distributed over the whole azimuth. The spaces between the axes of each reflector will be illuminated with a fainter beam. This inequality in the distribution of the light is the great disadvantage of the catoptric principle for a fixed light. For a revolving light, when eight reflectors are placed on each side of a revolving triangular frame, a flash may be obtained quite as bright as that from the great annular lens of Fresnel. The duration of this flash is also three times the duration of that from the lens—a great advantage, but then the eclipses between the flashes are total, in which the Fresnel system has the superiority.

The dioptric system owes its great superiority, for a fixed light, to its perfectly fulfilling the very important condition of distributing the light evenly all round the horizon. For a revolving light the eight lenses will give flashes of equal intensity, but of much shorter duration, than the 24 reflectors of the catoptric light. The secondary light from the fixed upper and lower zones compensates for this inferiority. The lamp of the dioptric apparatus consumes the same quantity of oil as 15 of the reflector lamps, and is therefore more economical, in the ratio of 5 to 8, supposing the serviceable effect of these lights to be equal, but this does not quite fairly state the case. Fresnel calculates

that in a first order apparatus for a fixed light, the brilliancy of the dioptric drum, or central portion of the apparatus, will be equal to 360 flames, that of the cupola of catadioptric zones above to 140 flames, and the lower zones to 60 flames, a total of 560 burners in all directions. Mr. Stevenson, who is probably nearer the mark, says 450 burners for the joint effect of the dioptric and catadioptric parts of the apparatus for a fixed light, and, calculating the whole effect of this apparatus as compared with the reflector light, that with the same quantity of oil, about four times the quantity of light is produced by the lenses as by the reflectors; but then the light, as seen before the axis of each reflector, would be 50 per cent. more powerful than the dioptric light. In revolving lights, assuming the same calculations, the dioptric light is more advantageous than the reflector, in the proportion of 3·6 to 1. This is supposing that the light is required round the whole horizon, but in numerous cases only a portion of the circumference is required to be illuminated, and this circumstance still reduces the average superiority of the dioptric system, so that, all things considered, the relative advantage of each system may be from one and a half to twice in favour of the dioptric.

There is one appearance which is produced by the lenticular apparatus which could not be made by reflectors, and when the distinction between one light and another is of such paramount importance, this is no small object, I allude to the fixed light varied by flashes. Perhaps this variety may be overrated in its utility. Mr. Alan Stevenson does not think it of so much value in its distinctive characteristic, and, up to a recent period, our Admiralty included in their list all of this sort of light with the revolving lights. From the brief duration of the flashes, and the long interval between them, usually three or four minutes, they may not be observed, and, in some cases of hazy weather, or snow, or other adverse circumstances, be not made out, and thus the light might be mistaken for an ordinary fixed light. The flashes are sometimes coloured red. In the French light, where colour is employed as a distinction, it is very pale, but in our English lights, those thus shown, which are of such intensity as is considered to be a useful distinction, lose 0·8 of the whole incident rays, which enormous loss forms a great argument against the use of coloured media if it could be avoided. Green or blue shades are still more objectionable from their great absorptive powers.

The lamps which are used in these beautiful instruments are all more or less modifications of the cylindrical wicked lamp invented by Argand, in 1783. Those in use for reflectors are the same as they were left by the inventor himself. For the great dioptric lamp, various contrivances have been made for regulating the supply of oil to the compound burner.

For a first-order light, this lamp consisted, in the first instance, of four concentric wicks, of the respective diameters of 0·827, 1·69, 2·52, and 3·39 inches, the smaller apparatus being constructed of 3 or 2 concentric wicks; but within these last seven years the interior wick has been dispensed with in all the burners, it being found that a

light of superior brightness can be obtained by allowing more air to pass into the flame on the inside, and forcing this air outwards on to it by a metal breaker or button kept below the level of the flame, so as not to interfere with the rays of light emanating from all sides of it. This, though it rather increases the consumption of oil, produces a far better light. The oil is made to flow into the burners by various means, as is stated above. Fresnel's invention consisted of a series of four small pumps, worked by clock-work, which forced the oil upwards to the flames. Another mode was by weights acting on a piston; a third by a spring doing the same office, a plan which has since become in universal use in the moderator lamps. Another mode, the pneumatic lamp of Messrs. Wilkins, acted by means of the pressure of air in the reservoir, and another, frequently applied of late, is by placing the reservoir slightly higher than the lamp, the oil thus flowing freely by its own gravity to the required level.

The fuel used in the English lighthouses in these excellent lamps up to the year 1846, was the best sperm oil that could be procured. At that period a change was made throughout the whole of the lamps, by adapting them to the use of colza or refined rape-seed oil, requiring a thicker wick. This oil was in use in the French lighthouses for some time prior to this, and was procured from the seed of a peculiar species of wild cabbage, known in the North of France under the name of colzat or colza. This plant is extensively cultivated in Normandy, &c., the chief markets for the oil being Caen, Rouen, Lille, and Courtrai. That now used by the Trinity House is chiefly refined by a patent process. This refined oil is of a superior character to the sperm oil; it produces a brighter flame, does not cause so much deposition on the wick, consequently, will burn much longer without trimming; any adulteration in it is much more easily detected than in sperm oil, and it is half the cost, although it has increased in value from 3s. 9d. per gallon on its first introduction, to 4s. 10d. at present. It is an excellent substitute for that oil, which is annually becoming dearer, and more open to being mixed with other and inferior oils. In the Liverpool lights olive-oil has been used since 1847—a change effecting a saving of 40 per cent. on the use of sperm-oil. In our colonial lighthouses other varieties of oil are used, of which one only need be noticed as being used in the lighthouses near the Cape of Good Hope. This oil is procured from the tips of the tails of the Cape sheep, and is said to be far superior to any other oil for brilliancy of light, but the quantity consumed, and the expense, are great. It costs 10s. 6d. per gallon, and the first-order light of Cape Agulhas consumes about 730 gallons a-year; 482 gallons of rapeseed-oil would be necessary for a year's supply.

One great advantage in the refined rapeseed-oil is that it does not thicken, except upon a very great degree of cold, a qualification which places it far above sperm and many other oils for winter use. Indeed the change is a fortunate one in another respect. The untiring perseverance of the whale-fishers from the neighbourhood of Nantucket

has so dispersed and destroyed their prey, that it is almost doubtful if a continuous and sufficient supply could be maintained, except at great prices.

The purity of the fuel, and the perfect combustion effected by the present arrangement of lamps, keep the flames used in the apparatus in their normal condition; but it is necessary to carry off the products of combustion from the confined space of the light-room, for, if they were not disposed of, they would both materially diminish the power of the light, and also be a serious detriment to the health of the attendant light-keeper, whose constant presence in the light-room is strictly required. This is effected by the ventilating tubes devised by Dr. Faraday, with the principles of which most are familiar; they are fitted to all our lighthouses. A plan, similar in action, but less complete in detail, was promulgated at the commencement of the present century by Dr. Van Marum.

As far as they were applied, then, the catoptric and dioptric systems, in use in the year 1847, acted perfectly; but still there was some waste of light, caused in one direction by the divergence of the instruments, and, in another, by their construction. The consideration of this loss of power led to the next steps in the science of pharology; since that period, some new arrangements have been proposed, by which some of the disadvantages of the dioptric system have been partially avoided. M. Letourneau proposed lengthening the duration of the great flash of the dioptric lens, by dividing it into two portions, and setting each half at a slight angle outwards; this would produce the desired effect, but it must be at the expense of brilliancy. Several other minor improvements also have been suggested, but the main features of the system have remained unaltered. There is some waste of light in both the systems. In the catoptric it is that angle comprised between the angle formed by the lips of the reflector and the flame and the horizontal ray which strikes the outer edge of the reflector. That portion of the light which passes upwards is, of course, lost for useful effect—the other portions may be considered as serviceable. In the year 1849 Mr. Thomas Stevenson proposed some arrangements which obviate this loss, upon what is termed the holophotal system.

The ordinary paraboloidal reflector is rendered holophotal as follows:—A small portion of the back of the reflector is cut off, behind the parameter, the line which passes through the focus; for this is substituted a portion of a spherical mirror of the same focus. In front of the flame a lens with three diacatoptric rings is added. The action of the spherical reflector is to return all the rays impigned on it back through the flame, and thus on to the posterior sides of the lens and diacatoptric rings. Therefore, all the rays which emerge from the lens, &c., will be horizontal, and the remainder, those impinging on the paraboloid, will also be reflected in the same direction. The Horsburgh Lighthouse, in the strait of Singapore, is fitted with 9 such holophotal reflectors—three on each face of a revolving frame,

each side of which, it is said, gives as much light as five reflectors of the ordinary kind. This was completed in 1851. A similar apparatus, a red light of the same sort, was placed at Wick, in Caithness, in 1851.

Fresnel's revolving light system, as at work in the Skerryvore and the Cordouan, with its beautiful but complicated upper system, is rendered holophotal by a very simple means. The zones above and below the main lenses act in the same way as the centre, and, by the whole apparatus revolving, nearly the whole of the light is projected horizontally in the eight directions of the octagonal prism. The diagram and the very beautiful fourth-order apparatus exhibited explains its action. Proceeding upon the assumption that the whole of the emitted rays from the central lamp may be made to assume the horizontal direction, Mr. T. Stevenson has made several most excellent arrangements, which, however, we cannot fully describe here. The simplest form is that of a hemispherical metallic reflector, in the focus of which is placed the lamp; before the lamp is a refracting polyzonal lens, of such a section that the whole of the direct rays from the lamp, and the reflected rays from the posterior reflector, are parallelised on their emergence. Carrying this principle to greater refinement, and as it was found that the totally reflecting glass prisms were effective compared with metallic reflections as 140 to 87, a hemispherical arrangement of glass is proposed, which, by refraction and total reflection, produces the same result as the metallic hemisphere in the former instance. The formulæ for the construction of this ingenious apparatus were calculated by Mr. Wm. Swan, F.R.S.E. The glass refracting mirror has one advantage over a metallic mirror in its powers of radiation, as in an experiment the heat in the interior of the apparatus was so great as to cause the oil to boil: an inconvenience, however, which was afterwards obviated mechanically. Very numerous other applications of his principle are also proposed.

M. Letourneau has proposed a simple arrangement of the fixed light with flashes, of the French system. It consists of alternate panels of horizontal and vertical lenticular elements, which, on revolving, show the alternate flash and fixed light without loss of power from the supplementary revolving lenses, as in Fresnel's arrangement. This may be readily exemplified by a very beautiful apparatus; for, supposing that each alternate panel of this revolving light were made to consist of horizontal elements instead of circular ones, the effect would be first the flash from the circular face, and then the steady light during the period that the plane side was passing before the eye.

The effect of all these optical refinements is to send forth the light from our lighthouses in a thin disc or ray without vertical divergence; but with great deference it is urged that this may be overdone; for, suppose that the apparatus acts perfectly, and the thin disc of light should only osculate the horizon of its station, it is manifest that any observer in any other position than the exact circle of the horizon, will have to mount some elevation, in order to see the light at all, and that to any one passing within even a short distance of it the light

will be invisible. Some amount of vertical divergence is absolutely necessary, and the optical defect of the reflector becomes a real advantage. We may cite the recent melancholy example of the *Dunbar*, wrecked beneath the lighthouse at Sydney, which was intended for her safety, but could not be seen because it was overhead. Red panes of glass have been added to some of our lighthouses at the lower part of their lanterns in order to point out to ships coming into their effect that they are inside danger.

Up to this point, therefore, we may consider that our lighting is perfect; all future optical improvements can only be introduced on the score of economy, and any increase of power must arise from the source of light. All the powers of our lenses and reflectors aided by the most efficient lamps, are futile against the obscuring effects of haze or rain or snow, and to be able to conquer this difficulty in the least degree will be the greatest step in the lighthouse economy.

The dioptric system does not appear to be adapted for floating lights as at present constructed. Mr. Wilkins and Mr. Letourneau have tried an arrangement of four lenses in front of the four lamps, behind which are spherical reflectors, being, in fact, a species of holophotal apparatus. But the great motion of the vessel prevents the possibility of keeping this apparatus constantly in a vertical position, a condition which is absolutely necessary for its proper action. Our lightships are, therefore, still furnished with 12-inch reflectors, one of which is exhibited. These being mounted on gimbals, readily obey every motion of the ship, and by their great divergence, (though there is loss of light,) obviate all those inconveniences to which larger instruments would be subject. But then these lamps and reflectors, up to this time showing a superior light to ordinary lamps, will not bear that comparison with those now used by steam-vessels that they did in former years.

The Messrs. Chance, of Birmingham, the well known glass manufacturers, have successfully competed with our French neighbours in the material as well as in the manufacture of the lighthouse lenses; and I believe their factories are the only place in this country where the operations are carried on to any extent. The fine and important light on Lundy Island, at the entrance of the Bristol Channel, is an example of their construction. It is a first-order holophotal apparatus, showing a revolving light. They are now engaged in making some important apparatus for our Trinity Board. It was believed that the glass could not be made in England so pure in colour, or rather with absence of colour, as to compare advantageously with that made near Paris, but these difficulties Messrs. Chance have overcome, and although I believe that some French material is employed, yet the improved processes have produced a result which compares well with the French apparatus shown in the French Exposition.

(To be continued.)

The Indian Ocean considered with Reference to the Wants of Seamen.

(Continued from p. 201.)

Homeward Routes.

We will now treat on the homeward routes from China to Europe and India.

In the homeward routes from China to Europe, the chief thing to do is to gain the S.E. Trade as soon as possible, with which a vessel will soon reach the Cape.

A vessel going from China to India, should endeavour to reach the strait of Singapore as soon as possible, and then run through the strait of Malacca. Thus in the two monsoons: When a ship leaves China in the N.E. monsoon for Europe or India, she would make for the strait of Banca and Gaspar, or for that of Singapore. In March and April the quickest route is the outer one by the Macclesfield Bank, and in these two months she would keep out to sea as far as the latitude of Pulo-Sapata.

During the other months, on the contrary, a vessel would take the inner channel, between the islands of Hainan and the Paracels, and would thus without difficulty reach the straits of Singapore, Gaspar, and Banca. From the two latter a course should be steered for the strait of Sunda. On leaving this strait the parallel of 10° N. lat. should be crossed in 100° E. long., and then a direct course for the South point of Madagascar. The ship would then follow one of the routes from Nos. 10 to 12. This route crosses the very middle of the course of hurricanes; consequently, they are frequently met by vessels from the Eastern seas.

We will now make a few observations on the outer and inner routes above-mentioned that may be of service to commanders not well acquainted with this navigation.

Inner Route from Macao to Pulo-Aor.—The inner route is the most direct that can be adopted for reaching the straits leading from the China Sea; it also has the advantage that vessels have the wind aft as soon as they have passed the Great Ladrone.

A ship taking this route should steer from the Great Ladrone so as to pass near the Taya Isles and the Paracels at a convenient distance to the West. The current may be estimated as setting Westward at the rate of fifteen or twenty miles a day, for currents are strong near the coast of China, although not so perhaps out at sea. Should it be found that the ship is drifted much to the Westward, she must shape her course so as to allow for it until she has reached the parallel of 17° N. lat., and entered the channel between the Paracels and Cochin China. Having reached this parallel, and the meridian of 100° 30′, a course should be steered so as to sight Cape Varela or the Pagoda.

With clear weather and an E.N.E. or N.E. wind, she may sight Pulo Canton, (called also Collao Kay,) or the coast to the Southward of this island, and then keep the shore at a moderate distance; but if

the weather is cloudy, and the wind has a tendency to become Easterly, it will be more prudent not to approach the coast till she is in the latitude of Cape Varela, nor enter the bay of Phuyen to the Northward of this cape. Should the conical mountain on the North shore of this bay be visible, it will indicate the position of the cape, for, as night approaches, the pagoda on the height, which commands it, is concealed by clouds. Having passed South of the parallel of 15° N., it will be found near the land that the current sets southwards; for between 14° 30′ and 11° 30′ it often sets at the rate of forty, fifty, and even sixty miles a day; but it is most uncertain.

When land has not been seen to the Northward of Cape Varela, (or Varella,) it is indispensable to make this cape, from whence the coast may be kept at a distance of twelve or fifteen miles.

When off Cape Varela, distant about four or five miles, a vessel may steer along the shore by day, but at night must be careful to avoid Pyramid Isle, and those near to it. If the night be fine, she can sight Pyramid Isle and its neighbours. In a clear night it may be made out at a few miles distant. Water Islands should then be steered for, about twenty-one miles further South. Having reached these islands, if the land appear further off than four leagues, it will be necessary to approach it in order to sight the mountain of *False* Cape Varela, which may be distinguished amidst the high land of the coast by its elevation and gentle slope towards the sea.

A vessel desiring to keep in shore and pass West of the Dutchman Bank, should cross Padaran Bay as soon as she is abreast of the high lands of Cape Varela. This is necessary, because in this part the currents take a S.S.E. direction, and it is very difficult to approach the coast against them. In a good position, when crossing the bay, soundings are found of 39 to 50 fathoms. Then at night Cape Padaran should be made on the starboard bow, in doing which great care must be taken, as it is most difficult to distinguish it in the distant land at the bottom of the bay.

Cape Padaran being once sighted, may be passed at a distance of three to six miles, and a course steered then so as to pass Pulo Cecir at the same distance from land, leaving it to the West. Should the Cape be only a mile or two off, a course should be steered so as to pass at a convenient distance from Pulo Cecir. On having passed this island in daylight at a distance of four to six miles to seaward, it should be brought to bear N.N.E. ½ N. before it is lost sight of from the deck; then steering W.S.W. and S.W.b.W. for six or seven leagues, according as most convenient, will pass West of Dutchman Bank, when a South course may be steered for Pulo Aor.

This route is not dangerous when the night is sufficiently clear to admit of the Cavern or Tron of Padaran being made out. In this case, being three to five miles from the cape, a course may be steered until the Cavern is made out, and when it bears N.b.E., the vessel will be off Pulo Cecir. In this case if soundings are found at ten or eleven fathoms, she should stand off from it, for the island is too low to admit of being seen easily at night, and the soundings are too ir-

regular to be of service. The Cavern bearing N. 16° E., Pulo Cecir will be in the same direction, and by running six or seven leagues between W.S.W. and S.W.b.W., will lead West of the Dutchman Bank, when Pulo Aor may be steered for. Should the night become dark, when near Cape Padaran, and the land not distinguished about the Cavern, the vessel should be kept between South and West, to about twelve or thirteen leagues from the cape, and the coast should not be approached to less than eleven fathoms of water, nor the Holland Bank in less than twenty fathoms.

Between the western edge of this bank and the eastern one of the Britto Shoal, which is the nearest to it, is a distance of fourteen or fifteen leagues; which channel may be taken during the night. A vessel should keep in soundings of fourteen or fifteen fathoms until she is five or six leagues South of Pulo Cecir; and when about thirteen leagues S.W. of Cape Padaran, it will be better to run on to the southward and westward for two or three leagues more, so as to give a good berth to the Holland Bank. A vessel should not have more than twenty fathoms until this bank is passed, nor less than fifteen fathoms when near the Britto Banks; by keeping a little to the westward when passing between these two shores, soundings varying about nineteen or twenty fathoms will be found. After passing the western edge of the Holland Bank, a vessel should keep in twenty or twenty-one fathoms, steering towards Pulo Aor.

The route between Pulo Cecir de Terre and the Holland Bank can only be taken during the night by commanders who are well acquainted with these parts; consequently, while waiting for daylight, a vessel is often obliged to lay by off Cape Varela. Besides the loss of time resulting from this, a ship has to contend with a heavy sea when the breeze is strong; for which reason, as already observed, the passage outside Pulo Cecir and Pulo Sapata is to be preferred.

Route for Passing outside Pulo Sapata.—A vessel finding herself at nightfall near Cape Varela, with bad weather or a wind too strong to haul up to, and not wishing to pass between the Holland Bank and Pulo Cecir de Terre at night, should steer a course to pass to the eastward of Pulo Cecir de Mer, and afterwards Pulo Sapata on the following morning. She may even run far enough out to sea, if the weather is cloudy, so as to pass a good distance outside of these islands. Indeed, when the wind is strong, the current sets S.W. and W.S.W. very strongly, and sometimes towards Pulo Sapata. A vessel would then be obliged to pass the night in the narrow channel between this island and the Little Catwick.

In daytime, with fine weather, a vessel may keep as near as she likes to Pulo Cecir, and pass between Pulo Sapata and the Large Catwick. She may even pass between the two Catwicks, but must remember that the Paix Rock is in their neighbourhood. Thence she might steer direct for Pulo Aor, and, reaching the neighbourhood of Pulo Timoan, in cloudy weather should keep in soundings of thirty-one fathoms, so as to pass East of this island for Pulo Aor. As these

islands are often concealed by fog, great care must be taken to avoid them and attend to the reckoning, especially during the night.

Near the Anambas, and to the northward of them, a vessel has generally thirty-five to forty-two fathoms. Between the parallels of 5° 30′ and 5° N. lat., these depths decrease in the western part of the channel, and twenty-seven fathoms are found on the meridian of Pulo Timoan.

Route from Pulo Aor.—When a vessel has passed East of Pulo Aor, at a distance of two to four leagues, for the Strait of Banca, she would steer to the eastward of South, according to the wind and prevailing currents, and pass outside the Geldria Bank, which may be avoided by keeping in a depth of twenty fathoms, and when between the parallels of 0° 56′ and 0° 40′ N., a course should be steered so as to cross the equator in seventeen fathoms of water, and pass four or five leagues from the East point of Lingin, if the current will admit. In all cases a vessel should guard against westerly currents, which are sometimes found in these parts, taking care that she is not set over to the Ilchester Shoal, South of this point.

Route to Banca Strait.—When off the East point of Lingin, about five leagues distant, a vessel would pass between Pulo Taga and the Seven Islands (or Toojoo). If she is farther to the eastward she would steer more westerly, and, having cleared the channel between Pulo Taga and the Seven Isles, she would make for Point Batacaran, the western extremity of Banca Strait, keeping at a distance of six and a half or seven leagues from it, in order to avoid the Frederick Henry Rock.

Outer Route from Macao to Pulo Aor.—When the outer channel is adopted from Macao for Pulo Aor, the vessel would pass at a short distance West of the Ladrones and neighbouring isles. On leaving the Great Ladrone, as strong winds and a heavy sea, with strong currents are found, a vessel should steer to eastward of South for the Macclesfield Bank, and in moderate weather she would endeavour to reach the East part of it. When at twenty leagues East of the meridian of the Great Ladrone, if there be difficulty in obtaining soundings, a vessel may then consider herself East of the Macclesfield Bank.

A vessel having adopted the outer route in November and December, with strong winds and no observations for several days, should strike soundings on the Macclesfield Bank; but if certain of her position, they may be neglected. The bank being very wide, East and West, and the soundings very irregular, the depth can only be an uncertain guide as to her real position.

On leaving the Macclesfield Bank she would steer for Pulo Sapata. If a vessel should have had soundings on that bank, and is on the same parallel, she should shape her course for that of Pulo Sapata; and should she not sight this island, she would steer West, so as to obtain soundings at thirty to thirty-five fathoms.

(To be continued.)

HINTS FOR MANNING THE NAVY,—*By one who has served both in Men of War and Merchant Ships.*

Mr. Editor,—It has often been the subject of inquiry, how it happens that, in this great maritime country, there is always a great scarcity of seamen, and a great difficulty in obtaining men for the Navy. That such is the case now we have only to instance the few line of battle ships lately commissioned for foreign service, and to refer to the repeated accounts of the dilatory manner in which men come forward, on the voluntary system, to man them. No doubt many of our best seamen have left the country or emigrated, not having been employed by the Government when they were to be had; or perhaps they refused service for the long period of ten years, a condition they never liked, although for three or five years they would have no objection to enter, and most probably would continue to serve. However this may be, the most constant and prevailing cause of this state of things is most certainly the total absence of any organized relations which might have been formed between the navy and the merchant service of this great maritime country; of which services the latter exceeds the former numerically by at least four to one.

That the Navy, in its present improved condition, can be unpopular among seamen, is utterly impossible, and those who remember what it was formerly, although they may say the hands do not move quite so smartly aloft as they did in the *Revenge*, with Sir John Gore, or the *Menelaus*, with Sir Peter Parker, yet, as far as the health and comfort of the crews are concerned, the old system bears no comparison with the present. All that can be done is accomplished in the way of comfort to the seaman,—such as good and wholesome food, good clothing, leave on shore, regulations as to pay and pensions, and leniency to offenders prevailing even to a fault. Indeed, should the most trifling grievance present itself in the Royal Navy, powerful friends of the Navy are ready in Parliament to tire out the Government with repeated applications on the subject, till they at last gain their point, and measures are conceded which in some ships cannot even be carried out! How different a picture might be drawn of the unfortunate and neglected merchant service, standing alone as it does, wholly unrepresented in Parliament! It is one of those facts which, as Mr. Timbs says, are not generally known, that out of about 660 members of the House, there are nine only who belong to the profession of the sea, and these are, five naval officers, two captains in the East India Company's service, and two of the general merchant service. How is it possible therefore to expect that any nautical question can have fair play, or receive its due consideration, unless it be referred to a Nautical Committee formed by men conversant with the most minute details, and possessing the most thorough practical experience.

It is understood that there are upwards of forty members of the House of Commons who have undertaken to support the petition of the officers of the merchant service with the view of placing that profession on a more satisfactory footing. In that petition it is truly stated that the merchant seaman, after all his life of toil and danger, has nothing to look to in the helplessness of old age but the parish workhouse. Up to the year 1853, there was, however, a small pittance doled out to old and disabled seamen, *not above four pounds per annum!* But under the plausible pretext of relieving the shipowners, even this was discontinued. The whole sum thus expended amounted only to £36,000 per annum, and yet the existing act has even the negative merit of screwing the poor for the imaginary benefit of the rich. As, however, that part of the petition relating to the pensioning of merchant seamen may come under discussion, now is the time for uniting justice with good policy, and to combine a system essentially conducive to the benefit of the public service as well as to the permanent protection of the country.

To effect this very desirable object it will first be asked, where are the funds to come from? Most certainly these are not the times to levy any additional taxation on shipowners, when influences are working to remove those burdens to the shoulders of other people. Yet as this is a great national question, the nation at large is as much bound to supply the ways and means, as it is to support the militia for the purpose of replenishing the ranks of the regular army; and by the plan here proposed, no money would be called for until the expiration of five years. By this plan it is proposed that it should be notified by a Proclamation, posted up at all the sea-ports of the United Kingdom, to the effect that "from and after a specified date, all merchant seamen entering the Navy and serving five years therein, and who can show, in addition thereto, a service of twenty years in the merchant service, shall receive a pension for life to the extent of £16 per annum, the age for entering the Navy to be from twenty to thirty-six years, including qualifications of fitness and a previous service of at least three years in the merchant service." With this pension in view, which would be obtainable at the comparatively early age of forty-one or forty-two years, some of the best hands would soon volunteer for the Navy, and often continue therein, and so have a choice of a pension in one service or the other. Five years having elapsed, names of seamen would then be placed on the pension list, who could show the above service, and through agents could receive their payments quarterly. Considering this merely an auxiliary force to the Navy, (unless events should force upon us any enormous increase,) it cannot be calculated that the list of merchant seamen pensioners would exceed the number of 16,000, which would require a sum of £256,000 per annum.

The pensioning of *all* merchant seamen after the age of sixty years, would also be a desirable plan if Government could devise means for raising the funds; but the former plan is completely a matter of policy, and in some circumstances may be a matter of necessity.

The plan would give immense strength to the hands of the executive, such pensioners, who were fit for service, being available in the home ports in urgent cases.

To consider the details of this subject as well as those embodied in the petition of the officers of the mercantile marine, it would be necessary to form a Committee, composed of six or eight first-rate nautical men jointly from the navy and merchant service, to be presided over by a nautical member of the House of Commons. This Committee might also do a great deal of good by examining and revising the Merchant Shipping Act, the weak points of which have been so often exposed, having been framed by men who had never been at sea, and who have consequently overlooked all those evils which the legislature was anxious to remedy;—such as the absence of all power to condemn rotten and unserviceable ships, or to prevent them from going to sea, an entire neglect of those important inspections as to outfits, cables, anchors, sails, &c.; the want of a scale as to the numbers of foremast-men to form the crews of ships in proportion to tonnage, so as to prevent disturbances and disputes among officers and crews on first starting off to sea, frequently ending in dangerous mutinies, arising from undermanning; no supervision provided for to enforce such parts of the act as are intended for the benefit of the seaman; no Maritime Courts either at the home ports or the colonies to try maritime offences or crimes; no limitation as to the employment of foreign officers and seamen in British ships; and last, not least, a certain number of articles, from 239 to 266, under the head of what is *mis*called *Discipline*, the whole spirit of which goes to undermine the authority of the commander, instead of maintaining it, and in which the most common and notorious offences and crimes prevailing at sea are not even mentioned by name! Such are some of the glaring and monstrous defects of that lengthy Act of Parliament, embodying the laws by which the mercantile marine of this country is regulated!

But there are also other causes which work indirectly against the facility of getting a good class of seamen both for the navy and the merchant service, among which is the abolition of the apprentice system. By that peculiar kind of legislation which it displays, we have cut the very germ of this fruit from under our feet; for unless we rear up a regular class of sailors from youth, as we did formerly, we can no more expect to get good hands than a farmer can to reap his crop without sowing the seed. It is from this cause that so many useless hands are shipped, men who have never been properly trained, and hence the continued complaints of the deterioration of seamen. But what else could have been expected from laws for regulating shipping framed by men without the slightest practical experience of maritime affairs.

A considerable amount of assistance would be meeting the constant and increasing demand for seamen, if such charities as the Marine Society were more extended. That on board the *Venus*, off Woolwich, is admirably conducted, and might be copied at Liverpool and

other important stations, where it would amply repay its supporters by keeping up a supply of seamen, and prevent the occasional unreasonable rise in wages.

Those who have the power and desire to be instrumental in carrying out useful and patriotic measures for manning our Navy without impressment, will do far greater service to their country than all the inventors of long bows, tubular boilers, or patent screws; for it has never been the superiority of our ships that has established the reputation of our Navy, but the right sort of men who were on board of them, and the excellent officers who trained those men to that high state of discipline, which for smartness and rapidity in the performance of a seaman's duty has long been the pride of this country and the admiration of the world.

TRIDENT.

THE FORE-SHEET,—*or Forecastle Law.*

"The end of the fore-sheet," a phrase not unknown to seamen of days gone by, connected with transactions by no means the most honourable to them, has just received an illustration by a smart Yankey skipper. While it is impossible not to condemn it entirely, one cannot but concede the ingenuity of its conception and the cleverness with which it was carried out. The whole transaction, indeed, seems to be more romance than reality, and in the hands of a Marryat would form a capital incident in a nautical novel. In fact, it savours more of the rescue of a prize of war than a sober proceeding in a state of peace. But here it is as related in an American paper.

The American barque *Adriatic*, which became famous from her disastrous collision with the French steamer *Lyonnais* in November, 1856, and still more an object of interest from her recent seizure by the French authorities at Marseilles, her confiscation by the Court of Admiralty, and her subsequent escape, arrived safely at this port at an early hour yesterday. We have had a long interview with her commander, Capt. Durham, and as the facts connected with her escape are matters of national interest, we proceed to state them as briefly as the nature of the subject will allow.

The circumstances attending the collision with the *Lyonnais* are already familiar to the public. Capt. Durham is very positive that it grew out of no fault on the part of his own ship, but resulted, as he alleges, from culpable mismanagement by the officers of the steamer. The judgment of confiscation was rendered by the Imperial Court of Aix in December last, and as soon as a copy was served on Captain Durham, believing that it was impossible, in the excited state of the public mind in France, to obtain justice, he resolved to make his escape if possible, and place the whole matter in the hands of his Go-

vernment. Of course he had to resort to stratagem to accomplish his purpose. Learning that the *Adriatic* would not be taken possession of until the full extent of loss by the *Lyonnais* could be ascertained, he improved the interval in devising the means of escape. He engaged a caulker, and had her caulked all round for about five feet above the water's edge, under pretext that she was so open, when the mistrals should set in, she would sink right there in the harbour. Capt. D. thinks there were no suspicions from this movement, for in the "noise and confusion" of the caulkers' operations he and an assistant were quietly reeving the running rigging on board and getting ready for sea. They worked at the buckets about three hours every night, say from nine o'clock till twelve, when there was much noise and it was so dark that no one could either hear or see what they were doing. What provisions they got were put on board another ship; and from thence transferred to the *Adriatic* during the night. The crew was also shipped for another ship, and subsequently taken on board the *Adriatic*, when they were so much intoxicated as not to be conscious of what was going on.

Capt. Durham commenced getting ready to haul out about nine o'clock on the evening of the 8th of January, his force consisting, besides himself, of Capt. ——, the two mates, and a boy. The ship lay in the middle tier about half way up the harbour, with both anchors ahead, and moored with a hawser astern. They bent the two topsails and maintopmast-staysail where she lay. The ship ahead of the *Adriatic* was made fast to the chain, and when the *Adriatic* slipped they let go the fast of the other ship and hove her right into the middle of the harbour ahead of her. When the captain awoke and found out his situation, and that his ship was adrift, there was no end to his imprecations against "the d——d Yankees." Capt. Durham had no time to spare, but got clear of him as soon as he could, and hauled down the harbour nearly to the guard-ship, when he stopped to take on his crew and to make sail. The crew were got on board by four o'clock on the morning of the 9th; they then set the topsails, and putting four oars in the boat put her ahead until the ship got steerage way. When the *Adriatic* got abreast of the guard-ship, her boat came off and demanded the fort pass of the former. Captain Durham, when asked for his pass, replied, "Prenez garde, la," and threw the officer a small bit of paper with two sous wrapped up in it. The paper and money, however,—whether by accident or design the captain does not say,—went over the boat and into the water, sinking to the bottom. The officer of the guard-ship then inquired for the name of the ship, when Capt. Durham sung out that she was the American ship *Luna*, that had cleared the day before. Nothing more was heard from the official, and the *Adriatic* passed on her way.

As soon as the fugitive got clear of the harbour, a fine breeze sprung up from the eastward, and at daybreak she was abreast of Plainier, and three good miles off the French coast. The *Adriatic* then took her course for Spezzia, in Sardinia, the captain expecting to

find his ship's papers there, and also some American man-of-war, who might supply him with an anchor and such other articles as he stood in need of. She arrived at Spezzia on the morning of the 19th of January, and anchored with the kedge, having cut loose both anchors and left them at the wharf in Marseilles. There was no man-of-war in port, and her papers had not arrived. Having no bill of health, the Sardinian authorities would not permit her to land. Capt. Durham then went on shore himself to the pratique office, where he met the American Consul, who informed him that intelligence of his escape had reached there, and that the French Government had telegraphed to all the ports of the Mediterranean to stop the ship in whatever port she might be found. Soon after her arrival orders came from Turin to seize the ship, and the officers actually placed a gunboat under her stern, with two guns mounted, having received orders to fire should any attempt be made by the captain of the *Adriatic* to move from the spot. The next orders received were that the ship should not be molested, but that none of her men were to be allowed communication with the shore, nor was anything to be sent on board of her, not even water, nor any kind of assistance offered.

In a few days, upon further reflection, all these orders were withdrawn, and Capt. Durham allowed to take whatever he desired to his ship, or rather, as he states, whatever he was able to pay for, which was very little.

Col. Long, the United States storekeeper at Spezzia, kindly furnished the ship with all she wanted. Just as she got her provisions and water on board there came on a fresh blow from the northward, and the ship was riding by the kedge and 45 fathoms of chain, with one of the chain boxes filled with stones to back it, and a hawser bent to the other chain box. She lay then in what is called Penagallia Bay, with the wind blowing right on shore. About two o'clock the ship commenced dragging; all hands went to work and got sail on as soon as possible, cutting away one chain box and dragging the other by the point, which she neared so closely that one might have jumped ashore from the deck. The ship kept drifting until Captain Durham was compelled to run a hawser ashore to the lazaretto, where he made out to hold her, until he went to town and got his papers. Returning to the barque, he put to sea. The following day the *Adriatic* boarded the ship *Elizabeth Dennison*, from whom she got more provisions and an anchor. She then had a beautiful passage of eleven days to Madeira, after first beating about for some time in order to put certain parties on shore who had no desire to take a trip to America. The voyage from Madeira to the United States was a long and tedious one, she having encountered alternately calms and head winds nearly throughout the passage. The crew finally exhausted all their provisions except a small quantity of beef, and it became necessary for the ship to make the nearest American port, Savannah, which she reached in safety, as before stated.

Upon the whole, the movements of the *Adriatic* have been truly eventful, and it remains to be seen what effect they are to have upon

the interests of her owners and the relations of the two Governments, should our own sustain the ship in her escape from the authorities of France. We have little thought of any serious results so far as the international aspects of the question are concerned.

Capt. Durham informed us that his freight from here to La Clotat was about 5,000 dollars. He has received only about one half of this amount: the balance is still held by the "Messagerie Imperial" Company, by an attachment made by the agents of the steamer *Lyonnaise.—Savannah Republican.*

The *Moniteur de la Flotte* makes some trite observations on the subject (on which there can be but one opinion amongst honest men) and concludes them with the following extract from the *Havre Courier.*

"If public honours are assigned to Capt. Durham, we ask what will they do for the smuggler who may find the means of successfully evading the Custom-house, or for any prisoner who may succeed in escaping from Sing Sing." But we have not learnt what these honours are.

THE RED SEA.—*Trading Ports.*

Attracted by a desire for travel, and actively mixed up with various commercial speculations, I have made journeys to the coasts of Yemen and Abyssinia, and have convinced myself of the great advantages with which commerce may be carried on there. I have observed the peculiar advantages of certain points of the coast for the formation of establishments combining the object of serving as depots for merchandise for the interior, and affording protection to ships in case of their requiring it. I will commence with Yemen and the coast of Arabia, and will then proceed with the opposite side.

We know that the commerce of Yemen is carried on at three principal points of the Arabian Gulf,—Mocha, Hodeidah, and Loheia.

Mocha, in 13° 20′ N. and 43° 20′ E., the first town met after entering the strait of Bab el Mandeb, no longer enjoys its ancient reputation. Notwithstanding its favourable position it presents no traces of its former prosperity, except a few of its houses solidly built of basalt, and which have answered the purpose of veritable fortresses. Of 60,000 inhabitants it once boasted, reduced to 20,000 in 1824, but 1,500 or 2,000 scarcely now remain within its walls, which are everywhere falling to ruin. Its roadstead, in which were formerly collected together a number of vessels for the sake of its coffee and even the produce of its salt works, has only a vessel there now and then. Ruin is seen in all directions;—in fact, the ancient capital of the province, where the Dutch, the Danes, and the French had their

trading houses long before the English, is fallen to the condition of a miserable town.

What has been the cause of this falling off? Is it the vicinity of Aden, which nourishes the presence of a foreign race odious in the eyes of all true Mussulmans? or is it the work of the Pacha, who has changed the seat of Government? Perhaps it may be traced to the result of these two causes combined and necessarily acting one on the other. The proximity of Aden—not twenty leagues distant—could not be without its influence on the determination of the Porte to make Hodeidah the seat of the Pachalik; and, on the other hand, the absence of the Turkish Governor leaves the field open to the agents of the East India Company, who contrive to disorganize far around them all those sources of strength which tend to arrest their progress.

Between these two causes, so injurious to its prosperity, Mocha could not fail to lose its resources and importance after the terrible blow which it suffered in 1834 by the Bedouins, who carried off the greater part of its inhabitants into slavery.

The culture of coffee which obtained a just celebrity, and which in itself was formerly sufficient to keep up its commercial prosperity, is limited to a district, the nearest part of which is fifteen leagues from Mocha. The coffee is cultivated principally in the neighbourhood of Senna, about three days' journey from Hodeidah, fifteen from Mocha, and eight from Loheia. A trade is also carried on between Senna and Bel el Faquir, a town of some importance between Hodeidah and Mocha. This district extends along the coast between Mocha and Hodeidah, at about twenty leagues from the sea, and thus there has been no great difficulty in turning to account the important produce of its rival.

The foreign commerce of Mocha does not exceed at present £80,000, in which coffee takes about a fourth, the remainder being absorbed by wax, gums, myrrh, ivory, and leather; for which Mocha receives in exchange cotton fabrics from India and America, silks, draperies, iron, copper, lead, wood, tools, tobacco, rice, and sugar, to about £6,000. The difference between this sum and its exports is accumulated in money called *thalari* (thalers).

Hodeidah is the actual residence of the Pacha, and although it has derived importance from Mocha, has no merit of its own to justify that favour. It is a new town, although already in a ruinous state, with a wall recently completed, with nothing remarkable about it. It is built of volcanic stone from the Tor mountain, which, from the accounts of the people, sends forth smoke occasionally. The anchorage, which may contain about fifty ships, is not preferable to that of Mocha, and is not secure excepting in the S.E. monsoon; but in that from the N.W., from May to September, there is a very troublesome sea.

Hodeidah has plenty of banians or Indian merchants, who pay a tax for being permitted to reside there. It is by Hodeidah that all the trade in Mocha coffee is maintained, this place exporting as much

as £200,000 annually, the rest of its exportations, which amount to about £40,000, consisting of leather, wax, ivory, pearl, myrrh, gums, &c. Hodeidah imports, like Mocha, cotton fabrics, silks and drapery, rice, sugar, &c.; and from being nothing more than a village of about 5,000 inhabitants, reckons now a population of 25,000, and seems likely to have many more. The environs are somewhat less sterile than the surrounding country, having some gardens of palms, &c., forming a protection for two kinds of chateaux.

Loheia, the third town of commercial importance in Yemen, is about twenty leagues to the north of Hodeidah, with a population of not more than 5,000. All her importance is derived from her port, which, although small and not capable of receiving vessels of above 150 tons, enables it nevertheless to command a great number of country craft. Her commerce consists chiefly of grain, of which the djoari or doura is the principal. This commerce, entirely peculiar, amount to about £40,000; in exchange for which Loheia receives merchandise of the same kind as Mocha and Hodeidah.

After having thus considered the three principal roadsteads by which the produce of Yemen is exported, and through which in return it receives the different fabrics of India and the United States or Europe, it is right to observe that in all this extent of coast there are several other places which contribute to augment their commerce, but of so limited a quantity that it appears no where. Nor need I further allude to those places of no note which otherwise, in favourable circumstances, might derive an importance which they do not now possess. But, on the whole, if the commerce of the three towns of Mocha, Hodeidah, and Loheia be estimated at the sum of about £730,000 annually of imports and exports together, one may safely conclude that for the whole of Yemen it will not exceed £800,000, but that it may be very much increased. It is well known that the traffic of the interior, which is not inconsiderable, but which it is impossible to ascertain, is not included in the above. The population on the coasts of this province is essentially given to agriculture; a feature by which, independent of their origin, they essentially differ in character from the people of Abyssinia, who, with but few exceptions, are given to a pastoral, and consequently wandering life.

In the different excursions which I have made on the shores of the Red Sea, I went on the eastern coast as far as the 20th degree of latitude, and from thence crossed the Arabian Gulf to go down towards Aden, coasting along the Abyssinian shore, the territories of the Danakils and Soumanlis, and my journal on these occasions furnishes the following general observations.

Notwithstanding my great desire to visit the coast of Nubia, which borders the Red Sea from Ras Roway to Ras el Kasaine, I was obliged to give it up on account of the bad condition of the small vessel in which I was embarked. It is difficult to imagine the very backward condition both in the art of ship-building and navigation among the natives of this country. But I will commence my ex-

tracts with the town of Massuah, in lat. 15° 35′ N. and long. 39° 37′ E.

It is well known that the isle of Massuah is the *entrepot* of the greatest portion of the commerce of Abyssinia. It is separated from the mainland by a channel about a quarter of a mile wide, which serves as its port. This low island, formed of coral, very sandy and arid, has a pretended Turkish garrison, formed principally of riff-raff and commanded by an Effendi, whose greatest care is to increase his fortune by every possible species of plunder that he can devise. Hence, his authority is little respected by the neighbouring chiefs, who are in a state of continual hostility either with him or among themselves.

England maintains a Consul at Massuah, who knows well how to profit by this state of things in extending English influence in these countries. The consular agent of France, as far as I can judge, does not appear to be guided by such motives. It is true that France has no Aden in the neighbourhood.

The commerce of Massuah, under a government more devoted to the improvement of the country, might be very much increased. Unfortunately it is not so, and the merchants of the interior meet in this port with nothing but opposition and insults of all kinds. Nevertheless they resort there in considerable numbers, for this island is so happily situated that it exports more than £500,000 of produce annually. This consists of coffee, myrrh, incense, hides, gums, ivory, senna, manteque, and gold dust; for which they take tissues of cotton, wool, silk, red and blue cloth, matchlocks, rice, sugar, tea, lead, iron, copper, timber, &c., amounting to two thirds of that sum, but a great part of it is paid for in specie, much in Maria-Theresas of Austria, called thalaris, (the thaler no doubt,) which are worth 5 fr. 50 cent., like our old ecu of 6 francs.

It is to its facility for defence that the little island of Massuah is indebted for the lead which it has taken in commerce over the several points of the Abyssinian coast. The Turks for many years have been encroaching on the chiefs of the coast: they have several villages there, of which one named Arkiko has several forts, and is a garrison of veritable Turkish bandits. Although Massuah seems to be well situated as an entrepot for the produce of Abyssinia, it is not to be supposed that there is no other place on the coast that would compete with it. I could name indeed more than one.

The two bays of Oakel and Amphella afford quite as good shelter to shipping as Massuah: they are to the South, and without any great trouble would become excellent ports. But what can be expected from the Turkish Government, so ill placed, which, instead of creating, leaves it to perish in its hands, when it does not deliberately destroy the riches which past ages have bequeathed it. If the Suez Canal were open and Turkish vessels could go direct from Constantinople to the Red Sea, I doubt even whether things would be much better in Turkish hands. At present the first of the two bays above-

mentioned has scarcely any residents and no commerce. In the second is a village of about 1,500 inhabitants, who have some vessels, but whose flocks are their principal riches. This is indeed little, but much more would soon follow.

Edd is a small village at the bottom of a bay tolerably secure, in 14° N. lat., possessing equally with Oakel and Amphilla all the conditions requisite for making it a place of interest. One thing, perhaps, you will learn not without surprise is, that a rich French house has established a counting-house there. There is reason to hope that by the intelligence of the agents the natural advantages of the position will render an attempt successful on which depends our future commercial prosperity in the Red Sea. The commerce of Edd, at present little or nothing, will no doubt become important. The Abyssinians cannot fail to find the advantage of sending their produce to this new market rather than to that of Massuah, where they have met with all those drawbacks of which the administration that governs that place is so prodigal. Edd is the furthest point visited by me on the coast of Abyssinia that deserves any attention in a commercial point of view.

Soon after leaving this territory, the exploration of which the hospitable character of its people renders so easy to the traveller, tribes of Danakils are met with, established at Billoul and Aight. These two places carry on a small amount of commerce with Aden, Mocha, and Hodeidah, the principal part of which is composed of manteque, ostrich feathers, mats, and the material of their construction. The coast abounds in herds of cattle, which form the riches of the people; but after passing Cape Doomairah, nothing is met with but a few wandering tribes, far apart from each other.

There is no good anchorage throughout the whole of this low coast, and nothing of the kind is to be found until arriving at the bay of Aboe.—*Moniteur de la Flotte.*

The Atlantic Cable Problem.

[We are indebted to the considerate attention of the Astronomer Royal for the following important communication.]

Mr. Editor,—The last year's history, and the present year's anticipations, of the attempt to deposit the Atlantic Submarine Telegraph Cable, have given to the mathematical problem of the deposit of a submarine cable a very great interest. The problem is by no means a simple one. To investigate the form assumed by the descending cable and the tension at every point, it is necessary to consider the motion of the ship and the continual change of position which it gives to every particle of the cable: this, however, as appears on entering

into the investigation, can be done without much difficulty. A far more important modifying circumstance is the resistance presented by the water to the descent of the cable, especially when the cable is so slender in its dimensions and so light in its material as the Atlantic Cable. I have however, with some trouble, completely mastered the influence of this cause also, and am able to exhibit my deductions in a shape which, I trust, may be practically useful.

I will not weary your readers, on this occasion, with a parade of algebraical symbols. In order to present the results in the clearest form, I have prepared a table on the supposition that the ship's velocity is double the terminal velocity of the cable when allowed to fall freely in the water (a proportion which, I believe, does not differ materially from that in the actual case). As the investigation is perfectly general, there would be no difficulty beyond the mere trouble of calculation in preparing a table for any other proportion of the velocities: but the table now offered, I believe, will be found sufficient for conveying the ideas which I desire to impress on the readers of the *Nautical Magazine*. It will be seen from my subsequent remarks of general character, that the preparation of such a table necessarily implies that the cable is delivered with the same speed with which the ship passes through the water. The circumstances of a cable which is delivered with a speed greater than that of the ship will be explained afterwards. The unit of measure is in all cases the depth of the sea. The unit of tension is in all cases the weight of a piece of cable whose length is equal to the depth of the sea, as weighed in sea water. So that if (for example) the tension is expressed as 2·5, and the sea is 2 miles deep, this means that the tension is the weight of 5 miles of the cable as weighed in water.

Angle made by the Cable with the Horizon at leaving the Ship.	Tension at the Point of leaving the Ship.	Length of suspended Cable.	Corresponding horizontal Extent.	Difference or stray Length necessary for the slope of the suspended Cable.
° ′				
2 52	747·23	19·326	39·311	0·015
5 43	173·62	19·303	19·267	0·036
8 34	71·33	12·616	12·564	0·052
11 22	36·78	9·254	9·184	0·070
14 9	21·36	7·222	7·134	0·088
16 53	13·26	5·849	5·742	0·107
19 32	8·50	4·843	4·716	0·127
22 6	5·46	4·055	3·905	0·150
24 30	3·32	3·376	3·200	0·176
25 37	2·39	3·031	2·839	0·192
26 34 limiting angle.	0·53	2·236	2·000	0·236

A cursory inspection of this table will show, not only the amount of tension in special circumstances, but also the increase of tension or amount of danger which may be introduced by mismanagement of the delivering apparatus. Thus suppose that the delivery has been effected with a stray length of 0·236 and with a tension of only 0·53, if by inattention to the mechanism the delivery is impeded for a time, so that the stray length is diminished by 0·166, the stray length will be reduced to 0·070, implying that the tension is increased from 0·53 to 36·78. The only indication of this which will be presented to the superintendant is, that the angle of inclination of the cable has been reduced from 26° 34′ to 11° 22′.

It is evident from this that a vigilant watch on the angle of inclination of the cable is of the utmost importance for its safety. And no one of the mechanical arrangements appears to require greater attention than one which shall faithfully exhibit to the eye of the superintendant at every instant the slope of the cable as it leaves the ship.

I shall now make a few general statements on the characteristics of the curve formed by the cable.

I.—*General Remark.*

A. In no case whatever is the convexity of the curve upwards.

II.—*The speed of delivery being supposed equal to the ship's speed.*

B. Divide the terminal velocity of the cable when falling freely in water by the ship's velocity, and find the angle of which this quotient is the trigonometrical tangent. This is the critical or limiting angle.

C. The lower part of the curve approaches in form to the common catenary: but the inclination of the upper part to the horizon never exceeds the limiting angle. If the tension be great, the curve is nearly the lower part of a catenary of large dimensions. If the tension at the bottom be small, the greater part of the curve will be nearly a straight line, lying at the limiting angle.

D. If the tension at the bottom be absolutely nothing, the form of the cable will be absolutely a straight line, lying at the limiting angle. There will be, however, a small tension at the point where the cable quits the ship (see the last line of the Table): the tension diminishes gradually from the ship to the bottom.

III.—*The speed of delivery being supposed greater than the ship's speed.*

E. If the speed of delivery be augmented, the tension is diminished, until the proportion of the speed of delivery to the ship's speed becomes the same as the proportion of radius to the cosine of the limiting angle. When this proportion holds, there is no sensible tension in any part of the cable: but it maintains a straight form, although inclined at the limiting angle, from the ship to the bottom,

where it will probably be deposited in something of a serpentine or involved form. Supposing (as in the Table) the ship's speed to be double of the terminal speed of the cable falling freely in water, the proportion just mentioned is the proportion of 1·1118 : 1, or the loss of cable is 11¼ per cent.

F. If the speed of delivery be augmented beyond this, the cable will not maintain its straight form in an inclined line, but will descend in a serpentine or involved form, preserving on the whole the direction of the limiting angle.

IV.—*Practical Inferences.*

G. If the cable be exceedingly weak, or the sea excessively deep, it may be good policy to ease the strain upon the cable by delivering it with a speed rather greater than the ship's speed, but not exceeding that defined by the proportion in article E. In this way, the cable may be safely laid in a sea of any depth whatever, as long as the ship is maintained in a state of motion.

H. If the cable be not exceedingly weak and the sea not extremely deep, the cable should not be delivered more rapidly than the ship goes (except occasionally when it is found that too much strain has been put upon it.) The angle of inclination should be less than the limiting angle by the smallest quantity possible. The most vigilant care should be given to prevent any sensible diminution of this angle.

V.—*Caution in regard to stopping the ship.*

I. If the ship's motion is stopped, and the delivery of the cable at the same time stopped, the tension of the cable is immediately much increased. If the stoppage of the ship occurs in deep water, the cable ought as soon as possible to be delivered out liberally, or the ship ought to be backed, till the cable assumes a position not much inclined to the vertical. No length of cable will be lost by this, as, upon the ship's again advancing, without paying out cable for a short time, the depending cable will quickly be taken up into a position similar to its former position, and without any irregularity at the bottom. The minimum tension, when the ship is stationary, is 1·00.

I will now indicate the only element affecting my theory upon which there may be uncertainty to such an extent as to affect in one case the practical conclusions.

The cable generally is subject to the lateral resistance arising from a lateral motion through the water, and also to the friction arising from an endwise sliding through the water: the latter movement being in most cases extremely small. As I have no sufficient data in regard to the amount of this friction for a given speed, I have supposed it the same as the lateral resistance for the same speed. No sensible error will be introduced by the uncertainty on this point, except in the case contemplated in article E.

Now I think it very likely that it may be necessary, in regard to the Atlantic Cable only, to deliver cable with greater speed than the ship's speed, as contemplated in article E. The strength of the cable appears to be able to carry about 4½ miles of its length in water; or, taking the depth of the sea at 2¼ miles, it will be about 2·00 if expressed on the same scale as the numbers of my Table. On referring to my table it will be seen that the corresponding angle for this tension approaches so near to the limiting angle, that it will not be safe to trust to delivery at the limiting angle with a velocity equal to the ship's velocity, but that a greater velocity of delivery must be used, to lighten the tension. But the per centage of excess of delivery (and consequently the per centage of excess of cable to be provided) will depend on the coefficient expressing the friction for endwise motion of the cable; on which, as I have said, there is great uncertainty. It appears to me not unlikely that the practical success of the undertaking, in the present season, may depend on this element, hitherto overlooked.

With my best wishes for the success of this remarkable enterprise,

I am, Mr. Editor,

Your very obedient servant,

G. B. AIRY.

Royal Observatory, Greenwich, 1858, *April 23rd.*

To the Editor of the Nautical Magazine.

[We commend the foregoing to the attention of those who are charged with the all important duty of laying out the cable. The conditions required to secure success are so clearly and concisely stated by the Astronomer Royal that they cannot but be at once evident, especially that regarding the angle which the cable in its delivery should always make with the plane of the horizon,—to be always regulated by the proper relations between the speed of the ship and that of the cable and changes in depth.—ED.]

NAUTICAL NOTICES.

CAPE INJEH,—*Black Sea: Magnetic Effects.*

A curious fact has just been discovered in the Black Sea that is interesting to navigation and science. On the 13th of March the Austrian steamer *Trebizonda* grounded on a sand bank East of Cape Injeh, about a mile and a half from Sinope. Thanks to the assistance of the Ottoman Admiral who is stationed at that place, she was got off after considerable difficulty, and continued her voyage. The captain of her however observed that in leaving the point off which he was on shore, his compass, which had shown a considerable amount of

deviation, resumed its proper indication,—and he at once concluded from this that his compass had led him astray.

He communicated the circumstance to the Minister of Marine at Constantinople, who sent an account of his statement to the authorities at Sinope.

Some days afterwards the same effect on the compass was observed on board the Ottoman steamer *Astrologer* and by the French ship *Henri IV.* The Commander-in-Chief at the Arsenal then ordered a Turkish brig to make some experiments in reference to the subject, from which it appeared that a deviation of the compass was found to take place in the ships along the coast within a range of thirty miles, of which Cape Injeh is the centre. On investigating the cause of this effect on the compass, a large mass of ferruginous rock was discovered, which has proved to be very valuable, commencing in a calcareous mass about three and a half miles from Sinope. The Turkish officers in their report entirely attribute the deviation of the compass so nearly fatal to the *Trebizonda,* to the presence of this magnetic mass, which until the present time has been entirely unknown.

Shoal off Cape de Gatte.

The following extract from *Mitchell's Maritime Register* gives the position of a shoal hitherto unknown.

Sir,—On my late passage from Constantinople to this place, while standing southward, with a light breeze from W.S.W.,I ran directly over a small shoal of not over four fathoms. The shells, pebbles, and clay, of which it seemed to be composed, were very plainly to be seen. We were right on it before we saw it, and were off it before we had time to sound, although going very slow at the time, giving us a short but good opportunity to see it plainly. The tower on Point Mesa (Point Mesa lies about twelve miles N.E. of Cape de Gatte) bore W.b.N. two miles distant, and Carbonera village N.W.b.N. three or three and a half miles. The shoal was small to appearance, not much over 100 feet in circumference, white on top, and dark around it as though covered with seaweed. The marks I took for it were the dark point (southern) of Point Mesa in one with a bold white cliff on the western shore beyond. I mention the dark point because there was a reddish brown point in a line with the dark point, which we opened out as we stood southward, and the castle at Carbonera in one with the northern slope of a small hill just back of the village. If you think this worthy of notice you will please give it a place in your valuable paper, and oblige,

J. W. Sylvester,
of the American barque John William.

Queenstown, March 26th, 1858.

Particulars of Lights Recently Established.

(Continued from p. 208.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
22. Surinam	Mouth of river	Guiana	F.	30	7	Floating. E. extreme of land E.¾S.; Bram Point Beacon S.S.E.¾E. Marked Surinam.
23. Mark Island Maine	44° 7·5′ N., 68° 43′ W.	United States	F.	52	12	Est. 1st March, '58.
Loggerhead Cay, Florida Reef	24° 37·3′ N., 82°55·2′W.	Dry Tortugas	F.	152	20	Est. 1st July, '58.
25. St. Ives	Cornwall	Godrevy Snd. Godrevy I. S.b.W.; St. Ives pier-hd. W.b.S.; N.E. extr. of Stones NNW½W.	R			Floating. A bright flash every quarter of a minute. *Caution.*—Ships passing outside of the Stones are not to approach within 1½ mile of her.

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

Portsmouth Breakers.—We find the annexed statement in the papers of the day, but as we can make nothing of it, perhaps Capt. Foote will kindly favour us with an account of what he meant, for the benefit of seamen.

Capt. Foote, of the U.S. frigate *Portsmouth*, reports that he nearly lost his vessel on a reef of rocks (not laid down in the charts) about thirty-five miles in a South-Westerly direction from Simoda, Japan, and thirteen miles from the land abreast of them. He named the reef "Portsmouth Breakers."

Mercantile Marine Service Association.—*Meeting at Liverpool.*

The first annual meeting of this association was held at their rooms, 20, Water-street. The attendance was rather numerous, and included, besides captains and officers, many merchants and shipowners. Amongst those present were T. B. Horsfall, Esq., M.P., J. Bramley-Moore, Esq., M.P., Messrs. J. Rounthwaite, Josiah Booker, Derbyshire, H. Fox, P. Magee, C. T. Perrie, Glint, Captain Reed, Captain Paton, Captain Cumming, and Captain Hammond. Captain Reed was called upon to preside.

The Chairman, in opening the business, said he must premise that his Worship the Mayor, whom he had shortly before seen, was unwell, or otherwise he believed he would have been present. He had also to apologise for the absence of Mr. Graves, Mr. J. Beasley, and other gentlemen, who had expressed their desire to be present. Without any further preface, he would call upon the Secretary to read the annual report.

Mr. B. J. Thompson, the Secretary, read the following report:—

The council has now the pleasure, at the termination of the first year of the

existence of the association, to submit to the members a report of its proceedings and a statement of the progress which has during the year been made in carrying out those objects for which the Association was formed.

It will be remembered by those who took an early interest in the Association that its origin was owing to a feeling of dissatisfaction existing in the service with regard to the tribunal for the investigation into the causes of wrecks and casualties to British merchant ships. Although this is an important subject, and one which, throughout its labours, has engaged the serious attention of the Council, it was felt that the necessity of union thus given, afforded an opportunity to the service and those interested in it to make an effort to elevate to its proper position, as a profession, the art and science of seamanship.

The objects of the Association were, therefore, extended so as to embrace not merely the procuring a revision of the portions of the Merchant Shipping Act which have been alluded to, but the doing of all such other things as would benefit, elevate, and improve the position, education, and comfort of the commanders, officers, and seamen of this great maritime nation.

In order to strengthen and to increase the weight and influence of the Association, the Council has sought, and with much and gratifying success, to ally with it the leading shipowners and merchants of the port of Liverpool. The members for the borough, with Mr. William Browne, M.P., and Mr. Ralph Brocklebank, have kindly testified their interest in the welfare of the Association by allowing their names to be placed as honorary members of the Council, and by giving liberal donations to its funds. The public meetings which have been held have been presided over by Mr. Ralph Brocklebank and his Worship the Mayor, and have been attended, and the proceedings at them approved, by the most eminent merchants and shipowners of the port.

In accordance with the resolutions at the first public meeting of the Association, petitions were presented to both houses of parliament to amend portions of the Shipping Act, 1854. From the necessarily late period of the session when these petitions were presented, it was not to be expected that any measure could be then passed to remedy the Act. Mr. Horsfall, however, brought the subject most fully and fairly before the House of Commons, for an inquiry into the constitution of the Board of Trade; and the Council believes that although the apparent result was fruitless, the ultimate result has been most profitable, by calling the attention of parliament and of statesmen to the grievances under which the service labours, and has prepared the way towards the Act being fairly considered, and proper amendments made in it.

One of the greatest wants in the port of Liverpool was felt by the Council to be the absence of any institution to which nautical men could resort to obtain information, to pass their time, and to transact their business. In June last the number of members had increased so much that the Council felt justified in engaging and fitting up the present offices, for the purpose of a news-room and reading-room. It has now much happiness in reporting that this step has met with complete success. Since the rooms were opened they have been in constant use; the number of members has steadily and regularly increased, and the Council believes a great want has been supplied, especially to the non-resident members of the service.

The Council desires to mention with pleasure that since the rooms were opened they have not only received from the members some most valuable presents, but that the Admiralty has given an earnest of its approval of what has been done by presenting to the Association a set of charts. Lieut. Maury, of the United States, has also presented to the Association a complete set of his wind and current charts, and Captain Becher, of the Hydrographic Office, has also given the published volumes of the *Nautical Magazine*, and has intimated it to be his intention to send the forthcoming numbers.

It may be well here also to mention that the Council has placed in the rooms books for receiving the names of masters, officers, and engineers desirous to obtain appointments, and that these have to a very considerable extent been used by the shipowners of the port.

In connection with the London, Southampton, and other associations, the Council was anxious that a joint application should be made to the Queen in council to grant a charter of incorporation to the mercantile marine service, to enable the profession as a corporation to take measures—

1.—To elevate the social position of the officers and men belonging to the mercantile marine, by taking means for their superior education, and the advancement of ability and character, and the better discipline of the merchant service.

2.—To reward officers and men of the mercantile marine for long and able service, for brilliant acts of seamanship, for saving life or cargo, for discoveries, inventions, or other contributions to the service.

3.—To provide refuges for aged, sick, and worn-out officers and men of the mercantile marine.

4.—To establish schools, afloat and on shore, for the education and training of boys and men for the service.

5.—To establish institutions at the principal seaports in furtherance of the general plan, and for the advantage of seamen; and to publish, or assist in the publication of any books, maps, charts, plans, or other works, for the use of the mercantile marine.

6.—To raise funds for the carrying out of these objects.

And generally to do anything, although not falling within the list of the above duties, that may conduce to the improvement or social elevation of the merchant shipping service, or to the instruction, benefit, or happiness of the officers or men engaged in that service.

The Council regrets to be obliged to report any difference of opinion as to the incorporation. A difference, however, does exist, although it is a small one, respecting the constitution of the council of the incorporation. This the London Association at first desired should be open to any one who would subscribe to the funds, but they afterwards proposed that the council should be confined entirely to shipowners and members of the service. Your council has felt that any charter of incorporation in connection with the service, should be distinctly one for the service; at the same time it anxiously desires, as is the case with this Association, to have connected with it not only shipowners, but merchants and every one connected with the service. It is proposed to effect this by the corporation being composed of members who must be, or have been, seamen, and "associates" who shall be shipowners and those interested in the service. The election of the council will rest with the "members," but any member or associate shall be eligible to be elected. It is trusted that this difference may speedily be arranged; and the Council deeply regrets that the London Association should in any way isolate itself, and differ from the views of this Association.

In connection with this subject the Council may mention that it felt it to be its duty to oppose an application on the part of the Shipwrecked Fishermen and Mariners' Society, to have appropriated to them a portion of the Mercantile Marine Fund, for the purpose of erecting a hospital on the banks of the Thames, for sick, worn-out, and disabled officers and seamen. The opposition was successful, and the Council considers that the then Government was not unwilling to have entertained, had it remained in office, a proposition on the subject of the application of the fund for kindred purposes, provided it were put under the supervision of the service.

Availing itself of the recess, the Council went minutely through such of the

clauses of the Merchant Shipping Act as affect the service; and drew up a memorial to the Board of Trade, detailing the alterations which it was considered ought to be made, and urging upon the Government the justice of giving to the service a share in its own government, by a representation upon the local marine boards, and of making an alteration in the tribunals, in the cases of wrecks and casualties, and the necessity of making a provision for the support of sick, worn-out, and disabled officers and seamen, and for the education and training of those entering or in the service

An influential deputation waited upon the President of the Board of Trade to present and support the memorial; and the Council feels that it has not only been promised serious consideration, but that the reply of the president was an admission of the importance and necessity of some action being taken upon the subject.

Another matter to which the Council thinks it right to call the attention of the members is the relief fund for Mrs. Rogers and her family, although, in this matter, the Council did not act as a body, but as individuals. From the fund raised, Mrs. Rogers has been placed in a comfortable position and enabled to earn a livelihood. The balance of the fund is in the Royal Bank, waiting the nomination of trustees; the accounts have been made up, audited, and published.

To further the objects in view, the Council has taken steps to connect with it the ports of Dublin, Cork, Belfast, Fleetwood, and Whitehaven, in each of which a resident Secretary has been appointed, and Committees are being organised.

In concluding its report, the Council assures the members that it has not only bestowed its best efforts to further and protect their interests; but that, in all it has done, and especially in reference to the Merchant Shipping Act, it has confined itself strictly to the matter affecting the service.

The thanks of the Association are eminently due to the members for the borough, to Mr. Ralph Brocklebank, and to his worship the Mayor, for the kind interest and attention they have taken in and given towards the promotion and interests of the Association, and also to Sir Hugh M'Calmont Cairns, M.P., the Solicitor-General, for his friendly letter of advice upon the subject of the memorial, which was submitted to him for his opinion.

The expenses of the Association have necessarily been, during the first year, somewhat large; but the Council trusts that the expenditure will be considered not only to have been so applied as to establish the Association upon a firm and proper basis, but will remember that a very large portion is represented by the fittings of the rooms, books, maps, charts, &c.

The labours of the Association are not yet done; to maintain the position gained, to make another step in advance, much and constant energy must be shown, not merely by the Council, but by the members individually; and it is sincerely hoped, and will be the best reward of this Council for its past year's work, to see the Association continue to flourish and progress until it becomes, as it ought in this, the greatest port in the world, a substantial, permanent, and efficient institution.

BENJ. J. THOMSON, *Secretary.*

20, *Water Street, Liverpool, April 8th,* 1858.

[The proceedings at this meeting and remarks on the report will be referred to in our next.—ED.]

Lady Passengers and the Ship's Compass.

Sir,—A commander in a royal mail service steamer in his last voyage found his ship at one time thirty miles out of her course, nor could his earnest remonstrances with officers of the watch, or with quarter-masters or helmsmen, improve matters, for the next day he found things in the same state of progressive error. Haziness of weather during the day prevented his taking altitudes for azimuths, while it rather increased his anxiety. It was only by night, when the horizon cleared, that he could occasionally get observations. By these he found his true position, and confirmed his suspicions as to some error in his course, while his compass was evidently *then* correct. Hence his time, and ingenuity, and patience were sorely taxed to ascertain, if possible, the cause of so much and increasing departure from his track.

His officers, sympathising with their esteemed and highly competent commander, bore, at last, his reproaches with real kindness, and avoided adding to their common inexplicable dilemma by any remarks betraying impatience under reproach. What was to be done? Instruments and calculations appeared to be equally faultless. Still, where should he "make the land" if these unaccountable vagaries of his ship were longer unrestrained?

Sorely troubled, and anxious as well as weary from having passed a sleepless, watchful night, the captain again, after breakfast, went on deck. Seeing a lady sitting (as was her custom) and working near the binnacle, it occurred to him that probably her scissors were resting on the ledge of it. On detecting nothing of the sort it was only reasonable that the gallant and polished sailor should suspect some peculiar "animal magnetic" influence in his fair passenger herself.

Accordingly, he approached her, bent on closer investigation,—nor did her very chair escape scrutiny, for he soon discovered that it had an iron frame. It also *quite reasonably* flashed across him that the lady's ample crinoline might cover an amount of "local attraction" such as beneficent nature had never intended. How could he tell but that springs of steel, or bands, or even *wheels*, or something yet unknown to our unenlightened sex, might lie therein concealed in sacred mystery! However, at length mustering all his faculties for a decisive attack,—a forlorn hope, he exclaimed, with as much forgiveness and as little reproach in his tone as possible, "Madam, you have by your 'local attraction' drawn my ship some forty miles out of her course!" Nor was he mistaken.

Now, Sir, I appeal (if permitted) to the world through your wide circulation, and ask respectfully if, in the judgment of your most fastidious readers, so really truthful a joke be not my full justification for stating that this most cautious and careful commander, immediately on his arrival in England, armed himself with the only known means of readily correcting a compass at any hour when an altitude should in future be impracticable at sea; and for suggesting that, henceforth, if it be indispensable to the *comfort* of lady passengers to wear these inscrutable crinolines on shipboard, it might be well for shipowners in their advertisements to announce that the royal mail steamship so-and-so carries a surgeon *and a spherograph*.

I have, &c.,

S. M. Saxby.

To the Editor of the Nautical Magazine.

The Late Capt. Bate of the "Actæon."

We readily give our assistance to the circulation of the following memorandum, and shall be glad if by doing so we promote the object of the Committee in so worthily perpetuating the memory of that much esteemed officer the late Capt. Bate.

H.M.S. Actæon, Canton, January 23rd, 1858.

Several officers and other gentlemen having expressed a desire to record their appreciation of the public services and private worth of the late lamented Capt. Wm. Thornton Bate, R.N., of H.M.S. *Actæon*, who fell before the walls of Canton in the performance of his duty on the 29th December last, it is proposed that a subscription be entered into for that purpose. Subscriptions to be limited to ten dollars, or £2, as a maximum.

It is understood that the mercantile and other resident community in China have already entered into subscriptions with a similar object, for the purpose of erecting a suitable Monument to Capt. Bate's memory at Hongkong. It is proposed that the sum now raised be added to the same fund, with the understanding that the surplus, after defraying the expenses of the monument, be applied to some charitable purpose connected with her Majesty's Naval Service, such as Capt. Bate might himself be supposed to have approved of.

The "Sailors and Marines' Orphan School," at Portsmouth, is suggested as a suitable object, Capt. Bate having, while alive, taken great interest in its prosperity, and its beneficial operation as a naval charity being undoubted.

If a sufficient sum could be raised to warrant its application to these objects, one or more gratuitous nominations to the charity, to be called "The Bate Nominations," and to be vested in the hands of some one or more permanent naval functionaries at Portsmouth, might be a suitable means of recording in perpetuity the high sense entertained by the naval service, and all others who knew him, of the eminent virtues of the late Capt. Bate, and of the universal feelings of regret elicited by his untimely fate.

The following officers have assented to act as a Committee for this purpose: Capt. Chas. F. A. Shadwell, C.B.; Capt. Wm. King Hall, C.B.; Comdr. Wm. M. Dowell.

The assistance of naval friends and others in England, who may be disposed to co-operate for the attainment of the above objects, will be gladly accepted if offered. Subscriptions will be received by Messrs. Woodhead & Co., Navy Agents, 1, James Street, Adelphi, Strand.

Chas. F. A. Shadwell, *Captain, R.N.*
for the Committee.

New Books.

Ships and Gales. Harbours of Refuge,

Is the name of a pamphlet by Mr. James Mather, one of the Commissioners of the River Tyne, as remarkable for the vigour with which he has embodied in his narrative some of the melancholy cases of shipwreck on the North-East coast, as it is for the disingenuousness by which he has endeavoured to divert attention from the proper means to prevent their recurrence! and for why? in order to foster the interests of shallow ports, which contrive to exist on that coast.

According to the dicta of this pretended friend to the mariner in distress, it

will be folly to construct deep water harbours where the great trade of the coast does not now mainly resort,—as at the Tyne and Wear: and that "to legislate without making this the leading consideration, would be futile and attended with fatal results! The national money would thus be spent in vain; wreck and death, loss and ruin, would attend the injustice and error. The authorities have been warned: 'let them be responsible.'" So says the curator of the Tyne on the part of the confederacy of the authorities at the Tyne, Wear, and Tees, all now strenuously at work, as in years gone by, to impede the formation of a deep water refuge harbour, the only fault of which would consist in its rivalry to the other coal ports, and instead of which they would rather have things as they are than that the North-East coast should possess an artificial harbour like those erected by the Government at Kingston, Holyhead, Plymouth, or Portland.

It is painful to see this strife of mammon sapping the life-blood of the country in drowning our seamen; to see these selfish feelings overriding those of humanity; to see the representatives of the Tyne, Wear, and Tees combining, or gathering as we have before described it, in an endeavour to thwart the benevolent intentions of the legislature to avert those dreadful calamities to which the North-East coast is constantly subject, by the formation of one or more *bonâ fide* harbours of refuge, with not less than thirty feet at low water,—harbours to which mariners might safely run in lieu of being, in the words of that able seaman, Mr. Wm. Richmond, "lured to their doom by the shallow ports which now exist!"

We can imagine the withering scorn with which such seamen as Mr. Richmond would meet the absurd statements of Mr. Mather and others of his calibre upon nautical matters that the most dangerous gales of the North-East coast of England are those *alongshore* or the S.E. gales, and yet such is gravely stated in the pamphlet before us; and in the evidence of Mr. John Robinson, another Commissioner of the Tyne,—gentlemen who point with complacency to the wrecks at the mouth of that river as illustrating the truth of their position; but conceal the actual facts that during those gales not one wreck should occur, as with a free wind and flowing sheet, which the S.E. would be, there is always the Frith of Forth to run to, and that the wrecks in those gales at the mouth of the Tyne occur from vessels running for shelter at an improper time of tide, besides many of the casualties on the wreck chart arising from bad seamanship and foggy weather, or from tow ropes breaking, out of the forty thousand annually crossing the bar of the Tyne.

Mr. Mather's views, as a Commissioner of the River Tyne, seem to be peculiar to himself, by the information he gives us that to exchange the present shallow bar of the Tyne, with its six to eight feet at low water, the piers now building will on their extension to fifteen feet at sea give fifteen feet on the bar, and that a further progress seaward to eighteen feet will secure that depth on the bar. Of course, as there is a depth of thirty feet a little further out, a *bonâ fide* refuge harbour will be easily made out of the Tyne; and, doubtless, as the affair is so very simple and easy of accomplishment, the same process will give the Wear, Tees, and all other similar shallow streams, equal advantages to those naturally enjoyed by the Humber and the Thames. Unhappily, we find that experience in the formation of piers at a Bar River does not warrant the hopeful expectations of Mr. Mather, founded on the basis of arithmetic, and we should still see realised the fact that "the gales that drive ships on that terrible lee shore shut the ports at the same time, and almost hermetically seal them," and that "it becomes then a life and death struggle with each tempest-tost vessel. It is chance, as she approaches, whether the lifting and foaming billow shall heave her into port, or a few feet to the North or South of it. The ship's steerage way perhaps lost—a momentary shiver of the sails—the snapping of a rope—the carrying away of a spar—a weak hand

at the helm, or a blow of a cross sea on the quarter—and away goes the staggering vessel, rushing to destruction, and her brave hearts to death."

And all this, so eloquently described by Mr. Mather, must continue because a selfish section of the great commercial interests of the Tyne and Wear cannot bear the very thought of a rival port. One would have imagined on patriotic grounds that the preservation of human life would have overridden all such selfish feelings, and that sound policy would have dictated that every effort should rather have been given for the establishment of those means which, by diminishing the great annual loss (never less than ten per cent upon the value of ship and cargo), would the better enable ships to compete with the coast railways.

It is always painful to see talent wrongly directed, but especially so when its aim is the sacrifice of life and property. In the pamphlet before us we hope to find that it has been harmlessly wasted in an attempt to foist wreck-traps on the public in lieu of urging the formation of *bonâ fide* refuge harbours for our exposed north country traders. We regret to see so much pains, so much talent exerted to *prevent* the boon of a deep water refuge harbour, so long wanted for the mariners of our North-East coast, and we most heartily hope that Mr. Mather's object will be defeated.

NEW GUINEA.—The Dutch Indian Government are about to send a scientific expedition to New Guinea, composed of a captain of the army, a lieutenant of the navy, a naturalist, and a draftsman, with the view of ascertaining the best mode of colonization applicable to that island, the superficial extent of which is 13,000 square miles, three times the size of Java, and twice the size of Sumatra, but does not contain a population of 50 to the square mile. The expedition will proceed to the Moluccas in the spring.

THE BOSTON DIVING COMPANY.—An account of two expeditions made up to the present time by this Company, relates the little success to obtain the remains of the ships sunk at Sebastopol. The two vessels employed in this trial are to examine the Turkish waters in the ensuing season. Another similar expedition to the Carribbean Sea suffered at St. Thomas by the yellow fever, but having reached Venezuela, set to work in the bay of Cumana, where the Spanish frigate *San Pedro* was lost. The submarine work has been continued for eight hours a day, and two guns have been discovered and a large number of dollars at the depth of 60 feet. This Mexican money was concealed by a thick deposit of chalk, but it will be easily recovered. The dollars have been found rolled together by 15, 20, or 100. The *San Pedro* had a million and a half in gold, a sum so enormous that it gives no small encouragement to the divers. By the blowing up of this frigate her treasure was sunk, a conclusion which guides the workmen. Many bars of metal have been found, which are believed to be of platinum. The company are satisfied with the results thus far, and are following up the work.

THE SUNKEN RUSSIAN FLEET.—Of all the seventy vessels that were scuttled or sunk in the harbour of Sebastopol between September 1854 and February 1855, there have been only one steamer, the *Chersonese*, and a few transports raised. The result of the examination to which the others have been subjected by divers, shows them not to be worth much expense being

bestowed on them. The ships of the line which were sunk at the entrance of the harbour, had already been ten years afloat, and have now been embedded in the sand there for two winters, so that they cannot be worth much. The liners, *Paris*, *Grossfürst*, *Constantine*, *Maria*, *and Tchesma*, are lying on their beam ends, and have been much injured by the lurching over of the guns, the ballast, and other ponderous articles; the *Chraby*, *Kullewtschy*, and the steamers *Vladimir*, *Bessarabia*, *Gromonessetz*, *Odessa*, *Krimea*, and *Turok* are described as standing upright on their keels, and it is proposed to lift them by means of the *Chersonese* and the transports. As regards those steamers which were among the vessels that were last sunk, considerable hopes are entertained that they may be brought into service again. The parties who have undertaken the recovery of these wrecks from the bottom of the harbour, are to be paid for their trouble and outlay with one half the estimated value of all objects recovered, a remuneration that is thought to be in all probability very inadequate to the expenses. The method proposed is to fasten on to the sides of the vessel to be raised sacks made air tight with tar or gutta percha. In the case of a ship of the line. it is calculated that two thousand of these sacks must be used, containing fifty thousand cubic feet of air. Whether the scuttled vessels can ever be used or not, it seems to be decided that they must be lifted, and not blown to pieces, inasmuch as by the latter process the roads would be encumbered with a vast number of chains, guns, anchors, and other heavy bodies, which would for ever after obstruct the anchorage very much.

SEIZURE OF A FRENCH VESSEL IN THE INDIAN OCEAN.—The *Ocean*, a newspaper published at Brest, states that the last mail from the Mauritius and Reunion Islands, has brought news of the seizure by the Portugues authorities of a French vessel named the *Charles Georges*, belonging to St. Malo, and commanded by Captain Rouxil. It appears that this vessel was laden with a cargo of 110 natives of the Comoro Isles, whom she was conveying to servitude in the Reunion Island. A Portuguese ship of war boarded her, and notwithstanding, it is alleged, the remonstrances of an official agent of the Portuguese Government, she was condemned as a slaver, ordered to be sold, and her crew placed in confinement.

We fully participate in the feeling expressed in this extract from a Madras paper.

It is with feelings of no ordinary regret that we announce the death of the benevolent Christopher Biden: the melancholy event occurred at five o'clock last evening. Capt. Biden had been ailing for several months past, increasing years brought with them sickness and infirmity, and the good old man was about to return to England preparatory to retiring on his pension. For the last two or three weeks he had not left his house, but it was not until Tuesday that serious symptoms presented themselves. Yesterday morning it was only too plain that his end was fast approaching, and at five in the evening he breathed his last, dying in a very calm and peaceful manner. His remains will be interred in the cemetery attached to St. George's Cathedral at half past five this evening.—*Madras Spectator*, Feb. 26th.

Sayings and Doings.

Portsmouth, April 25th.—H.R.H. Prince Alfred has been placed under the charge of Lieut. Nelson, attached to the *Illustrious* (training ship), and com-

manding the gun-brig *Rolla*. His Royal Highness has been cruising about on board the brig nearly every day, we understand, during the past week, and undergoes the same course of instruction and is treated precisely in the same manner as the other naval cadets, with this exception, that he dines at his own residence at Alverstoke in the evening, and frequently invites the naval and other officers of the port to join him. He is described as an inquiring, affable, and amiable boy.

A Washington despatch says:—"The House Committee on Foreign Relations has requested Capt. Durham, of the barque *Adriatic*, to appear before them on the 19th inst., to make a statement of the facts connected with the French arrest of his vessel and his escape. The captain will attend."

One of the most unfortunate occurrences which has happened at Liverpool for some time past took place on April 22nd in the burning of the ship *James Baines*. Her destruction is complete. She arrived in the Mersey from Bombay, with a full cargo of Indian produce, consisting of jute, hemp, linseed, and rice. On Sunday the ship was docked, and on Monday the work of discharging was begun. On Thursday, at six o'clock, the stevedores having removed the hatches to continue the work of discharging, the ship was discovered to be on fire, considerable volumes of smoke being seen to issue from the after-part of the main hold. As soon as the news of the conflagration reached the respective fire stations, several engines were dispatched, and in a short time there were eight playing on the ill-fated ship. At an early hour she was scuttled, but in consequence of there being an insufficiency of water in the dock, this was ineffectual. At about eleven o'clock the mainmast went; a short time after the after mast fell, and at a quarter past three the foremast gave way with a fearful crash, falling upon the roof of the adjoining dock-shed with such force as to cause it to fall in. By five or six in the evening the vessel was burnt to the water's edge. As soon as the fire took head the vessels adjacent were removed out of the neighbourhood, and the precautions used, as well as the happy circumstance that the wind was low, confined the fire to the one ship. No doubt is entertained but that spontaneous combustion was the cause of the fire.

With the object of rendering the lighthouse at the Edystone more distinctly visible from vessels at sea during the day time, the tower is about to be coloured red and white in alternate horizontal bands.

The glorious old *Victory* is about to resume her post as flagship at Portsmouth, having been in process of refitting for some nine months.

Scarborough 7th April, 1858.

Sir,—Please to erase, in page 201 of the *Nautical Magazine* for April, the words "Bar." and "Ther." from the column of altitudes in the table of "Augmented Refractions."

I remain, Sir, &c.,

E. H. HEBDEN, Jun.

TO CORRESPONDENTS.

We have been obliged to defer for our next several communications for which we could not find space in our present number.

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

JUNE, 1858.

The Russian Navy.

The Russian navy was not permitted in the late war to take a very active part; nevertheless it was evident by the seamen gunners employed in the batteries of Sebastopol, and by the guns of the same place, that their training had been much improved of late years. It may be interesting, therefore, to take a glance at the organization by which this result was obtained.

The constitution of the Muscovite navy is entirely military, and is founded on a distribution of persons and materials in five divisions, of which three are stationed in the Baltic and two in the Black Sea. However the clauses of the late treaty of peace may have modified this distribution as far as concerns the Black Sea, it has not as yet undergone any change to our knowledge.

The above divisions are again separated into three brigades. Each brigade mans three ships of the line, two frigates, and some small craft. Each ship with its smaller craft receives a man-of-war's crew, forming together a total of from 45,000 to 50,000 men for the five divisions.

The Admirals are commanders-in-chief; the Vice-Admirals command divisions; the Rear-Admirals the brigades; the Captains of the first class command the crews, part of whom man a ship of the line, and the other part the small vessels under the orders of the Captains of the second class, or Lieutenant-Captains, a grade similar to our Captain de Frégate.*

* Of the French navy.

Under the superior officers, the Lieutenants de Vaisseau* command the companies; the Midshipmen (Aspirants of the first class), who have the rank of officer, are the Lieutenants of the Companies, and hold a position similar to the Ensigns de Vaisseau;* still they very seldom have the chief command. The Gardes Marines of the Russian navy correspond to the Aspirants* of the second class. They are supplied from the School of Cadets for the Imperial Navy at St. Petersburg, and after having been exercised in the Baltic fleet, are dispersed as Midshipmen among the ships of the fleet.

In this organization of the officers each one, whatever may be his rank, acts by order of a superior; by which means authority is concentrated and a unity of action in the service is maintained: at the same time, from one brigade to another, from one division to another, an emulation is excited which produces the best results.

In general the three divisions of the Baltic man twenty-seven ships of the line, eighteen frigates, and ten steam-ships, without including the reserve of ships in ordinary and gun-vessels. The number of the crews in the ships of the Baltic is 1,000 men, in consequence of the few small vessels generally employed there. In the Black Sea, on the contrary, where the service requires a considerable number of cruisers and transports, the crews are 1,200 men, capable of manning a ship of eighty or ninety guns, a corvette of twenty guns, a brig, and a transport.

The Black Sea fleet previous to the late war was entirely under the orders of an Admiral, who was Commander-in-chief there. He receives a certain sum to keep this fleet in a good condition, and employs it at his own pleasure, generally according to his own fancy, constructing, repairing, or condemning ships, and replacing them entirely on his own responsibility. The Admiral of the Black Sea has under his orders two Vice-Admirals, commanding the two divisions of the fleet, and the Vice-Admiral Governor of the two ports of Nicolaeff and Sebastopol. A Rear-Admiral was director of the arsenal of Sebastopol under the orders of the Vice-Admiral Governor.

During the war in the Caucasus small cruisers, both sail and steam, were constantly employed. They were divided into bodies of seven small vessels, under the orders of a frigate bearing a Rear-Admiral's flag.

The following are the different ranks of the Russian navy with their corresponding ones in the army on shore.

	Army Ashore.	*Army Afloat.*
1.	General Field Marshal.	General Admiral.
2.	General { of Infantry. / of Cavalry. / of Artillery. }	Admiral.
3.	Lieutenant-General.	Vice-Admiral.
4.	Major-General.	Rear-Admiral.
5.	Brigadier-General.	Captain-Commodore.

* Of the French navy.

	Army Ashore.	*Army Afloat.*
6.	Colonel.	Captain of First Class.
7.	Lieutenant-Colonel.	Captain of Second Class.
8.	Major.	Captain-Lieutenant.
9.	Captain.	Lieutenant.
10.	Second-Captain.	
11.	Lieutenant.	Midshipman.
12.	Sub-Lieutenant.	Garde-Marine.
13.	Ensign.	

The annual pay of the rank (independent of table and other allowances) is as follows:—

Admiral Commander-in-Chief	Fr. 13,500 =	£540
Admiral	5,625	225
Vice-Admiral	4,500	140
Rear-Admiral	3,375	125
In the Gardes Marines.		
Captain of First Class	Fr. 2,500 =	£100
Captain of Second Class	2,000	80
Lieutenant	1,575	65
For the Remainder.		
Captain of First Class	Fr. 2,000 =	£80
Captain of Second Class	1,700	68
Lieutenant	1,250	50
Midshipman	950	38

Independent of these officers and in imitation of Masters (a class of officers so important in the British navy), the Russians have pilot officers, who have the rank of Lieutenant de Vaisseau, and who are specially charged with astronomical observations, the reckoning, and the log of the ship. They never become Commanders of the navy, but they may attain the advancement of Hydrographic Engineers, Inspectors of Lighthouses, &c. They are assisted by Pilot-Assistants.

The responsibility of the Officer Pilots never exonerates the Commander, who is responsible for his own ship, and gives the course according to the observations of the Pilot without being bound to follow his advice.

The second officer in command of the ship is the choice of the Captain. He gives the necessary orders when the hands are on deck; and when after a commission the Captain is satisfied with the services of his second, he claims, and generally obtains, for him the command of a ship.

The Russian crews are generally formed one-third of Russians and Cossacks, another third of Poles—the most of whom are Jews, and another of all sorts, but principally Greeks.

The Russian peasants from the interior of that country are generally taken into the navy at seventeen or eighteen years of age, and go through twenty years of service. They are incorporated in companies of 250 men, and are at the same time sailors and soldiers.

The pay of Russian sailors is extremely small: that of one of the

first class is not more than thirty francs for the year. They are clothed by the Government, and their rations, when afloat, provided for them. At present, as is well known, the ration is proportioned according to the appetite of Peter the Great, who fixed it at its present quantity after a month's experiment. The result is that each sailor does not consume more than half of his ration, and is paid for what he leaves, an economy which produces him from twenty to twenty-five francs a month. The Russian sailor is daily allowed a quarter of a pint of brandy and half a pint of wine.

The petty officers have not much better wages than the sailors. Their only advantage consists in having half a ration more, which secures them from forty to fifty francs a month from their savings. They live with the rest of the crew, having the liberty of choosing where they will hang their hammocks.

Previous to the war the crews of large Russian ships were scanty, but, on the contrary, in small vessels they were numerous. The result of this was that one watch at a time could only hang their hammocks, the other lay about the deck. Each watch, therefore, take it in turn by night to hang their hammocks. As the state pays for his clothing, the sailor is careless about his dress, and hence he is frequently in a condition which has been a reproach to a good many Russian ships.

The crew of every ship afloat generally leaves on shore a certain number of artificers by profession. These men work for any one. They do not use more than half of what they earn, and with the other half a fund is formed, from which every man discharged from the service is paid a hundred francs, a sum which enables him to return to his family, to whom an absence of twenty years afloat must rather tend to render him a stranger.

The officers themselves, as shown above, are paid little better; but when embarked the allowance made to them for servants, which nevertheless they cannot have with them, and to whose rations they are entitled, added to the allowance for their table, places them in a very advantageous position. These allowances, especially to a stranger, are calculated on a very liberal scale.

The retiring allowance of officers is made by thirds of the pay after twenty years of service; two-thirds are assigned after twenty-five years, and the whole of the pay when afloat after thirty years. It is right to add that, except in extremely rare cases, no person is retired from office. At most when it is desired that an officer should retire he is given a command very inferior to his rank. In such an event no officer, whatever his rank, can remain in service. Positions n the consulates, in the outports, in the naval and military administration, and embassies are, in fact, always the retreats for good officers of the navy and army.

The service afloat in large ships is most simple. The captain is charged with everything and accounts for everything. He, nevertheless, shares this responsibility with one of his officers named by Government, and to whom is given the title of revisor. This revisor

is an officer of the ship of the same corps as he who commands the ship. If at the end of a regular period the accounts of a ship are not considered to be correct, two-thirds of the amount in default is charged against the captain, and one-third against the revisor.

When a ship is in a Russian port her captain sends to the authorities of the port a report on the condition of the crew, and the treasurer of the port on receiving it delivers to him the wages, according to the number of men. The captain divides it among the captains of companies, who do their part by paying the men. When the ship leaves the port at which she has fitted out for a long voyage, the captain receives on board funds in anticipation *(prevoyance)*; he renews them, according as may be necessary, where he may happen to refit and where he finds Russian diplomatic agents. With this money he pays the purchases made of provisions and clothing for his people, and sends home in duplicate the lists of things supplied, signed by the Russian consul when there is one at the place, and also another of the sum remaining in his hands.

The same course is observed in the system of commissioning and putting out of commission as in the rest of the administration, as remains to be seen; but we venture to affirm that this simplicity of routine is consistent with an absolute control and prevents abuse.

Before the last war the ships of the Black Sea fleet were principally built at Nicolaief, but were only partially fitted out there, the shallowness of the river not permitting them to receive their guns, provisions, water, and other stores, which were in consequence shipped at Sebastopol. On the arrival of a new ship at this port, a storehouse was appropriated to her, and at the same time her captain, principal officers, and crew were appointed. This crew and storehouse always belonged to this vessel while she was in being, but when undergoing refit her number of officers was decreased. By this system the fittings of a ship always remained the same; as things became worn out they were renewed, whether on board or in the storehouse, and by this arrangement in a few days, even in twenty-four hours, a whole fleet could be got under sail.

The advantages of this permanent arrangement are evident; it may be expensive with regard to the crew, but it is certainly economical with respect to the fittings, as they are always kept in constant repair by the same men. The crew become attached and remain by their vessel, as their period of service is never less than twenty years. A degree of emulation is also established in each crew, and, however zealous the men are for the navy, this emulation always benefits the state.

The system is perhaps one which is rendered necessary by the severities of the climate and those periodical storms which prevent the greater part of the squadron from going to sea during the winter. But the crews of some of the vessels are disbanded during three or four months of the year. At this period a portion of them are landed and pass the winter in barracks.

We have referred to the formation and organization of the crews.

In this last war there was no opportunity of seeing them work at sea, but all the ships of the Imperial Russian navy that we met with in the Baltic or Black Sea, or in whatever latitudes, were very well handled. One of our officers speaks thus of them in 1850:—

"The manner in which the Russian seamen work their sails, the silence which reigns on board, their quickness and intelligence, are surprising when one considers that they were taken from the plough to be transferred to these vessels. Before I came into contact with these Muscovite vessels I had never seen the three topsails of a corvette changed and set again in less than three minutes. I see this, however, every day, and I can confirm the assertions of Russian captains that their large ships do things as smart as these. The way they bring a ship to anchor, get under sail, and the manner in which they set sail on leaving port, are all highly creditable to them as seamen."

The same officer remarks that there is nothing to be desired in the discipline of the ships, and, as we have often said, frequent corporeal punishment is not the reason, for the lash is reserved for graver offences, such as robbery and desertion. Thus it appears that the permanent crews, the oft repeated exercise, and the activity of the captains, make up for the defects in the manner in which they recruit their fleet.

The difficulties of recruiting undertaken by the Government are described in a valuable work by Hanthausen. According to this writer, the Russian ships of war suffer principally from the want of improvement of the mercnant service, in spite of the encouragements it has received for more than 150 years. The best mercantile sailors are the Fins of the Baltic, the Cossacks, and the Greeks of the Black Sea; but their number is much below their wants. Thus, contrary to what is the case among the principal maritime nations, the number of seamen of the imperial navy is infinitely great to that of the merchant service of Russia; for seamen are raised for the fleet not only in the maritime countries but also in the interior of the empire. The maxim of Peter the First, admitting that every man is fit for service, is more easy of application in Russia than anywhere else, nevertheless in the navy this is only justified to a certain extent.

The Russian navy does not receive the able seaman, but makes him of the peasant when sent to complete the number required. The Government has frequently endeavoured to inspire their youth with a taste for a maritime life by bringing them up on board ship and making the men-of-war a sort of nursery for the merchant service, which afterwards gives in quantity what it receives in quality, but the national taste has no tendency for the sea. So much is this the case that they endeavour by all possible means to elude the law, which requires that every captain in the merchant service shall be of Russian origin. Thus, frequently the Russian who in a seaport is performing the duties of captain, fills a much more humble position when the ship is once under way, and the real captain—German, Swedish, or Norwegian—then reappears from his obscurity in com-

mand. Latterly, this dislike of the Russians for the sea is wearing away, owing perhaps to the care which the Emperor Nicholas took to bring up one of his sons to the navy,—the Grand Duke Constantine, who is at present the High Admiral.

The time is gone by when, as Hanthausen says, "The officers of the Russian navy delighted in wearing boots and spurs, and boasted that it would not be long before they were in the army." It is not only with respect to the crews and the officers that the Imperial Russian navy has improved since the reign of Nicholas, but also with regard to the vessels, and especially the gunnery.

Moniteur de la Flotte.

THE RED SEA,—*Trading Ports.*

(Continued from page 265.)

Aboe.—The bay of Aboe may be entered with little difficulty; it is an excellent port for refitting in, and the safest perhaps in the whole gulf. The passage into it is free from all dangers; it has 5 to 6 fathoms in it; is about a quarter of a mile wide, and protected by reefs from the violence of the sea. The depth at low water is sufficient for the largest frigates, and it is extensive enough to hold a hundred vessels. On the other hand, the rise and fall of tide, which is not less than 7 to 8 feet, will facilitate the construction of dry and wet docks. Besides this, it has the great advantage in these arid and parched up districts, of excellent water at a short distance off. At the head of the bay is an extensive plain, which is watered by mountain torrents after the rains. This plain, which is about six miles in circuit, is always covered with excellent pasturage, and trees always green. Yet notwithstanding all these advantages, the bay of Aboe has no settlement. In the N.W. part of it there is a spring of hot water, which is covered when the tide is up.

Ras Ali.—About twenty miles S.W. of Aboe is another anchorage, not so extensive but presenting not less advantages for a harbour. The port of Ras Ali, which belongs, with the rest of the coast, to the Sultan of Tadjoura, has an entrance rather too shallow and obstructed by a bar of coral. But this bar, which is of a trifling width, might very easily be removed by gunpowder, and then Ras Ali as a port would rival Aden itself in point of safety, and surpass it in respect of commerce.

The harbour of Ras Ali is sheltered by high mountains, and would easily hold 120 ships of large tonnage; it has a depth throughout of 20 to 30 feet. Some batteries placed at the entrance would be sufficient to protect it from seaward, an advantage which is not found at Aboe. There is a bar of 6 to 8 feet of water about 125 to 150 feet

across in a length of 1,600 or 1,800 feet, and is evidently no very formidable obstacle.

The population in the vicinity of Ras Ali are well inclined, and would have no objection to see a European establishment there. It has a spring of excellent water at the distance of half a mile, sufficient for every want; and should it be desirable to occupy it, it would be easily obtained by means of a present, or a small sum of money to the Sultan of Tajura. According to the character which I have learnt of this prince, he would be glad to see an establishment for European commerce on his territory.

The impost which he levies does not exceed 30,000 francs, and the half of that sum would satisfy him if it was permanently secured to him. And without doubt he would require no great compensation for territory which to the present time remains unoccupied. The residence of the Sultan is at Tajura, a town of 2,000 inhabitants on the North shore of the bay of that name, three miles from Ras Ali.

Tajura.—The commerce of Tajura is supplied by caravans from Abyssinia. Of the regular produce of the country only hides, manteque, and animals are found there.

Ambabou—is a little village three miles S.W. of Tajura, belonging to the same chief, a place celebrated for the richness of its pasturage.

Gubet Kharab.—At the head of the bay of Tajura there is a lake, the Gubet Kharab, which communicates with the sea by a deep but very narrow channel, and the current is in consequence so strong that the passage is difficult and often dangerous. This state of things is the more provoking, as nothing can equal the beauty of this lake, which has good depth, and but for this difficulty would form one of the finest and largest ports in the world. In the barbarous condition of those countries one cannot think of turning such places to account; but when civilization extends there this admirable lake will be most valuable.

About fifteen miles at the back of Gubet Kharab is an extensive field of rock salt, where the caravans for Abyssinia resort for it as in the interior they receive a money value for it and thus facilitate their traffic. It is evident that this deposit of rock salt indicates the former presence of the sea there.

The South shore of the bay of Tajura presents no other point of interest, and the well known ferocious disposition of the Sommaulis Hissa serves no less than the dangerous reefs of the shore to keep vessels at a distance from it.

Zeylah.—The town of Zeylah, one of the best known of the country, is in 11° 18′ N., and 43° 5′ E., and has about 4,000 or 5,000 inhabitants. It was off Zeylah, the only commercial town of the whole coast from Tadjoura to Berberah, that the French steam-corvette *Caiman*, was cast away in 1854. Her remains, which the fishermen have not been able to carry away, now lie secure owing to the mass of sand which the sea has collected about them.

Berberah—is one of those places which has long occupied the attention of England. Its commercial importance, the safe and extensive nature of its natural harbour, and its position opposite to Aden, all concur in impressing on the occupiers of this place the desire of extending their influence over it, and especially to prevent its occupation by any other power. Situated on a sandy plain, exposed during the S.W. monsoon to intolerable heat, the town of Berberah is nothing more than an assemblage of straw huts, which afford shelter from October and April to the caravans which collect there from all parts of the interior, and of which some have to make a journey of more than sixty days to get there. Numerous country vessels on the other hand proceed there from the coasts of Persia, Arabia, and India, and from what is known as the fair of Berberah while it lasts, it is considered that as many as thirty-five millions of the floating population of the most opposite origin, assemble there, forming an amount exceeding a hundred millions of people. For such a place this is an enormous movement. At the fair a considerable trade is carried on by exchange of articles, and which by exports only amounts to about 12,000,000 to 15,000,000 of francs.

The principal items of this exportation are gold-dust, ivory, ostrich feathers, roots, myrrh, senna, various dye-woods, coffee, hides and leather, beasts, horses and mules, wax, honey, gums, manteque, &c. The imported articles taken in exchange are of the same nature as those already enumerated in referring to Massuah. About two millions of francs are taken in thalers, and a fourth part of the whole traffic is done for Aden.

Aden.—All the world knows that the East India Company took possession of Aden in 1839, and made it the seat of their power in the Red Sea. From that time they have taken every pains to render it impregnable, and previous to the occupation of Perim were continually adding to its strength, which has obtained for it the name of the Gibraltar of the Red Sea. Aden, which in 1839 reckoned only 1,300, has now increased her population to 25,000 inhabitants, independent of the thousand sepoys and 900 European soldiers kept there by the Company. This population is composed of Indians 11,000; Arabs, Muselmans, and Jews, 8,000; Somaulis 6,000, &c.

This increase of the population would doubtless have been much more rapid and much greater if the town was not entirely deficient of fresh water, for it has only two wells, which furnish no more than 5,000 gallons of drinkable water per day. All attempts have as yet failed to pierce for it, those only yielding brackish water not drinkable. Thus one is obliged, unless content with an extremely reduced allowance, to have recourse to the Arabs, who, by means of their boutres or by camels, bring as much as is required by the town from the opposite side of the peninsula every day.

There seems to be reason for believing that the aridity which renders Aden so difficult of defence if the place had to undergo a long and vigorous siege, has always existed there. In fact, in different parts of the peninsula large reservoirs well formed have recently been

discovered, which the government is repairing. It is not known when these gigantic reservoirs were constructed, the only traces of a large and populous city of which they attest the importance. But a careful examination of the architecture would render some idea of the time as well as the people by whom they were made, which should be reported. They are estimated to contain sufficient water for the supply of 15,000 people for many years; but at Aden, where rain only falls every two or three years, and then only for a few hours, although with considerable violence, I can scarcely believe that these basins would be easily replenished.

Independently of the military importance of Aden, it has no less in a commercial point of view. As the general entrepot of commerce in the Red Sea, this place receives annually for its native produce six millions of francs, arising principally from the coffee of Yemen and Abyssinia, the hides, leather, and animals, tallow, butter, myrrh, bulbs, incense, ivory, pearl, ostrich feathers, senna, &c. The products of British India, China, Persia, United States, and France, amount to about the same value, consisting of cotton tissues, silks, drapery, metals, powder, matchlocks, champagne, wines of Bordeaux, brandy, preserves, &c.

The silver coin consists of thalers, and East India Company rupees may be also included among the imports; sovereigns, the twenty francs gold pieces of France, and the five franc pieces are one fourth.

Different lines of steamers use Aden as a common centre from Bombay, Calcutta, Australia, and Mauritius, and the importance of these lines every day is seen in the advantage experienced by voyagers as well as in the rapid delivery of the mails by the route of the Red Sea over that of the Cape. These steamers have large supplies of coal from England by ships of all nations touching at Bombay for return cargoes. The quantity of coal imported annually at Aden for the use of the steam-packets, and which in 1850 did not exceed 20,000 tons, is now estimated at nearly 65,000, of which 35,000 tons are for the use of the Peninsular and Oriental Company's vessels.

From the time that the English first took possession of Aden, so important to them in many points of view, they have been careful to secure it from all attacks, whether from the Arabs or any other enemy. But besides this very natural solicitude, they have never forgotten that their principal efforts in the Red Sea should be directed to spread their influence over the races which occupy its shores, with the view of becoming masters hereafter of this admirable route of communication with India. With that perseverance which belongs to the British Government in following up an adopted plan, they have taken every care to gain over or to intimidate the weakest tribes as well as the most warlike chiefs.

Numerous agents, official or unofficial, have penetrated every where among the people, and either by gold or menaces generally with effect, have established a power from which on any day assistance may be obtained. At the same time that devoted and expert emissaries are employed, the authorities of Aden employ every pos-

sible means to shackle the researches of foreign voyagers, and to watch the proceedings of the few ships of war which explore the Red Sea, more especially when these are French. As for the latter, they cannot make sail from Aden without being followed by English ships or by country vessels sent on purpose to watch their movements and report them. They may content themselves nevertheless with the reports of pilots or interpreters, which they are obliged to employ in those dangerous waters, and who depend almost entirely on the East India Company. There is established in fact at every place where landing can be made, a system of espionnage which informs them of all their proceedings, all the orders of their commanders. As to travellers they have employed a very simple system. They have prohibited the chiefs of the two coasts to receive them under pain of the displeasure of England, and it is not without proof that I advance such a fact as this.

I could name a traveller who, on visiting a Sultan of these parts in 1855, had expressed the desire of making his town the point of departure on excursions into the interior of the country. The Sultan hesitated for some time to reply to this communication. At length he replied that he had received from a high personage at Aden the most formal prohibition to watch every voyager who might pass his territory for Abyssinia, and ordering him to do all he could to prevent him. This communication did not at all surprise the traveller, and he passed on; but he took care to represent to this chief that the arms of European powers were strong enough to protect their subjects wherever they might be. "You talk to me about the greatness of your country," replies the Sultan to the traveller; "I admit it; but what is your power to us? We scarcely ever see your flag here! while that of England is always with us, always busy either in oppressing us or rewarding us, according as we obey or slight her orders. If we affront her, is it your country that will protect us?" and then confiding to his interrogator the intolerance of this yoke, he expressed to him his desire of seeing European establishments formed, which would afford resources against such things.

I can add another instance to the above. Another traveller, who had frequently stopped at Aden, whenever he intended to leave went to take leave of the Governor, and to say that he intended returning. The traveller having learnt that this act of mere courtesy on his part had occasioned a secret inquiry into the object of his journeys, went away one night without going through this ceremony. The persons with whom he was accustomed to be were immediately summoned by the chief magistrate of Aden to give an account of what they knew of the motives of this sudden nocturnal departure; and their answers being considered as unsatisfactory, they became the object of an active surveillance, from which they were only relieved by the traveller's return. Owing to his repeated absence he had been taken for nothing less than a secret agent of the French Government, and it was supposed that he had gone for the purpose of visiting the *Sybille* (French frigate), which had been thereabouts for some weeks. I can assure

of the truth of this fact, which is sufficiently characteristic; but I will proceed to others of a different kind.

Isle Perim.—The possession taken of Aden has been, one may say, the first public display of this ambition. Under the pretext of constructing a lighthouse on this island, which commands the strait of Babelmandeb, fortifications have been silently commenced there, which will be carried on to their final completion. The same would be told you by every one who has passed between Perim and the Pilot Rock. Another occasion has opportunely offered for making another no less important step in this line of conduct. Some three years ago, certain English officers having attempted to penetrate into the interior of the country from Berbera, became the victims of their imprudence. This port was immediately blockaded, and continued so until the chiefs of Berberah were compelled to enter into a treaty of commerce with the East India Company that placed them entirely in their power. The treaty, dated in January 1857, is about a year old. Already for the purpose of observing the execution of this treaty, which, among other things, protects the trade in slaves. [Verily the gentleman who contributes his information to the *Moniteur de la Flotte* has been sadly deceived,—for without referring to the treaty or anything else, we fearlessly assert all this is utterly without foundation, and would not for one moment be countenanced by any British Government.] An English establishment, consisting of several men, is formed during the whole of the fair that commands the port. It is but too probable that the post will be gradually increased, and it will become necessary to build a fort for its safety. I have observed above that Berbera is the most important place in a commercial point of view on the whole African coast.

Ile Camaran.—Not very far away in the North, near Loheia, in 15° 20′ N. lat. and 42½° E. long., is Ile Camaran, which has equally excited the covetousness of the East India Company. At present this island is used as a place of banishment for convicts by the Pacha of Hodeidah, and has only a few men engaged in the pearl fishery. The island is not cultivated; but it has a good port, capable of containing a whole fleet, and what is more, some good wells of excellent water. Unfortunately the sensation produced by the occupation of Perim has not yet subsided, and they have not yet been permitted to establish themselves there. But no doubt there will soon be an opportunity for doing so. In fact, if the project of a line of telegraph between India and Egypt is realised, it is to be supposed that it will follow the plan recommended by the Commission of Engineers, and Camaran is one of the stations. This commission, among other matters, has gone fully into the subject of fortifications of places required by the East India Company; it was at Mocha several days, and has gone over the coast to the South. According to the plan adopted by it, the stations chosen between Suez and Aden are the towns of Kosseir, Suaken, and the isles of Camaran and Perim. The two first are nominally considered as under the Egyptian Government; but will the opportunity be lost of taking possession of Camaran under

the pretext of protecting the station which it will form? It may be doubted.

Massuah Isles.—I have omitted to notice these among the lately acquired possessions of the English situated at the entrance of the bay of Tajura. In fact, these islands, purchased nearly twelve years ago from the chief of Tajura for about 400 piastres, are still inhabited. They have an excellent port, but difficult of access and destitute of water.

England no doubt will be ready to avail herself of the opportunity of forming a European establishment in the bay of Aboe, either at Ras-Ali, or in the Gubet-Kharab.

It is easy to perceive that the fear of some European power obtaining a position in the Red Sea under any pretext, has guided the East India Company always from the time when possession was taken of Aden, and doubtless this apprehension has increased since the project of cutting through the isthmus has become probable.

If, as there is reason to hope, this admirable project is about to be executed, it is impossible to foresee the great importance of the number of ships of all nations that will enter the seas of the Southern hemisphere by this near route, and should not the mercantile marine of every country find a place of protection for ships of their flags? The question can but be answered in the affirmative. But setting aside restraints which English policy cannot fail to advance against the admission of foreign powers into these waters, and render them exclusively Britannic, what places could the Red Sea offer to Europeans as possessing advantages both in a commercial and military point of view.

I have shown sufficiently in the foregoing the reasons which induce me to declare in favour of Ras-Ali and the bay of Aboe. To this I now add the isle of Camaran, on which the English have already cast their eyes, but which is not yet their's. Then again, in the archipelago of Ahlac, the large island, Dhalac, has an excellent port. If profiting by the abandonment of Socotra by the English, one might dream of founding an establishment on its shores, between Ras-Presser and Ras-Fellingk, and also in the bay of Tamareed excellent anchorages would be found, affording alternate shelter from the monsoons. I visited Socotra some few years ago, and am satisfied that finding a reason for abandoning it in its want of water was nothing but a pretext. In fact, numerous sources of water may be found there in the valleys covered with vegetation always fresh. This fertile land is far from the arid rock of Aden, which would not have been preferred to it but for its position in the Indian route.

Such are the observations which I wished to send you, and which are of a nature to interest you. They will show you clearly what is the position of the East India Company, or rather of England, in those parts. As she is there in the presence of people of no political importance, she is too much accustomed to believe herself at home there. Without the least concern she disposes of every part which does not possess any great natural resources, but retains those points

which are of the highest importance for occupation. As she alone possesses India, Australia, and would have the exclusive trade of China, opened by recent events, no flag but hers is to be seen in those seas. Nevertheless, Holland has considerable colonies there; Java, Sumatra, Borneo, &c., are admirable, and are destined to still greater developements. The Spanish Philippine Islands are not to be despised. France herself has establishments which should not be neglected. Portugal has also some there; Denmark, also, and the Hanseatic towns, have some commerce there, without mentioning Austria and the Mediterranean countries, which desire nothing better than that the Red Sea should be accessible to them. There are immense resources there, and legitimate hopes of them. It is easy to see that the British flag is more common in those seas than any other, but it is not right that it should be there alone, and this would be an illegitimate pretension to which it is not right that British agents should accustom themselves. In their present singleness there they are too well contented, and it should not be forgotten that the shores of the Red Sea are shared by Egypt, Turkey, and Abyssinia.

[In transferring the foregoing to the *Nautical*, our only object is to render the information afforded by an experienced French voyager available to our readers. At the same time it may not be without good effect to allude to the mistaken views which he seems to have adopted. In respect of the isthmus question (on which being political we express no opinion) that is said to have been settled by the Ottoman Government: but we cannot help thinking that the mere circumstance of the British flag being more common there than any other, arises more from the Red Sea being accidentally by nature the shortest route to India, than from any other reason;—that as to anything like jealousy on the part of this country at seeing there the flags of all the countries of the world, such an idea exists only in the mind of the author. The fact is, that as yet it has been much out of the way of trade, but is as open to it now as it ever has been,—its free navigation rendered more secure by the excellent charts published by the East India Company, more than twenty years ago, and accessible to every one, and it is evident that navigation will be rendered still more secure by light-houses, so essential to the vessels that will no doubt resort there hereafter, whether the isthmus be opened or not.—ED.]

The *Moniteur* of the 8th of May (says the *Flotte*) contains the following notices from different ports of the Red Sea, that may direct attention in a commercial point of view to the N.E. of Africa and the navigation of that coast.

At Berbera the purchase of commodities is accomplished with great facility, and the chiefs of the tribes promise that every Frenchman who would come during the commercial fair should meet with a good reception.

The trade of Zeyla, which for some years has been considerable, has been entirely given up since the governors have arbitrarily levied enormous anchorage and custom-house dues. Only a few country vessels are seen there of a very small tonnage; and a very small number of caravans from Abyssinia still go there; for the only route, which is very difficult, leads to Choa, and this route is the scene of

numerous robberies. It is surrounded by the most barbarous and ferocious of African tribes, who attack caravans when they are incapable of defence. The anchorage of Zeyla is difficult of access; it is infested by banks, although very little trouble would render it an excellent port in all seasons. In all cases it is prudent to drop anchor when a vessel is in 6 feet more water than she draws, for a troublesome sea soon gets up.

Tajura.—The numerous routes which lead from Tajura, and which go to the Southern part of Abyssinia, must eventually render this an important place. As many caravans might be induced to come here from the interior as one could wish. It is only necessary to submit to the mode in which trade is carried on, and which consists in reposing confidence in the honesty of the chiefs of caravans, as it is necessary to advance a sum equal to one third of the amount of goods expected from Abyssinia.

Hodeida,—which but for a few years as yet, has supplied all the coffee of the Persian Gulf and India, is nevertheless of so little commercial importance, that it can scarcely now supply the smallest quantity of it. It boasts some large occupied houses of two and even three stories, and yet among its extensive ruins scarcely a thousand inhabitants can be found.

The archipelago of the Dhalac Isles contains some good anchorages, but few inhabitants, very wretched, and with water always brackish. Navigation there must be conducted with great precaution, and a ship working there in the day time should keep a good look out, and allow for the defectiveness of the charts, on which many banks of a dangerous character and islets do not appear.

Massuah.—Two or three thousand free labourers might be recruited easily in the province of Tigre, and the greater part of them Christians, if an establishment were formed on its shore. The country is remarkably fertile, and twice the number of caravans would resort there if labourers were recruited there, and especially if it were a centre of commerce. Moreover, commercial operations would be facilitated with the King of Tigre, first, because he is a Christian, and next, because for more than twenty years he is the only one who has always assisted the Missionaries in spite of the orders which he has received from the schismatic Bishop of Abyssinia. In fact, as long as the isthmus remains unopened and France has no mercantile house at Tajura or on the coast of Abyssinia, the best plan, and certainly the most lucrative one in those parts, is to purchase at Berbera, at Mocha, and at Hodeida, the portions of cargoes which at these places are consigned to Aden. By means of country vessels freight is readily carried, and ships which cannot complete their cargoes at Mozambique, Zanzibar, and Samoo, come to Aden to take in merchandise.

In fine, the opening of the Asiatic Canal promises the happiest results for the future commerce of N.E. Africa, which one may truly say have not yet been developed to the extent of those riches of all kinds which it could offer to commerce. If we add to this that Ta-

jura is situated in the route of ships which stop at Mozambique, Zanzibar, and Samoo before going to Aden to complete their cargoes, it cannot be doubted that great commercial houses would find it to their advantage to establish their factories there under the charge of active and intelligent agents.

A Farewell Word with the Atlantic Cable.

Before another number of this journal appears we are led to hope that the Atlantic Electric Cable will be at rest on its final bed under the waters of the ocean. The subject is invested with so many sources of thrilling interest to commerce and science, that we must be permitted to take a parting glance at it. The whole project may be looked on as a great experiment, and there are even those who not only pronounce its failure to be certain, but that the very first process of safely placing the cable on its bed is worthy of derision. These persons are no doubt well satisfied with their own opinions and would consign all questions of a secondary nature—those, for instance, of the more modest electricians, who doubt whether the fire from their batteries will be effectual throughout the distance of 1,750 nautical miles—to the realms of speculation.

But if opinions did not differ, if we all thought alike, what would be done? Science would stand still, all enterprise would sink from want of emulation, and we should all die of sheer ennui. Happily, such a state of things has not come to pass in this country, and a flat contradiction to it appears in the project of another cable just started to go from hence to Portugal, and thence to New York. Why not? But of this *verbum sat.*

Assuredly the very word experiment implies uncertainty.—a word justly applied, too, in the present instance, for although the electric cable is not unknown in the bed of the sea, still the depth and extent to which it has been as yet carried there are nothing in comparison with that which is here contemplated. The very first process, considered in all the magnitude of its proportions, is quite new. A variety of opposing influences have to be expected,—causes threatening fatal effects to be anticipated and prevented, all new and never yet dealt with on so large a scale. No doubt a certain catankerous concatenation of concurrent "untoward" circumstances might mar the whole project and afford a temporary triumph to the doubters. We say temporary! for we are not of those who believe that the sun will never light up the "sea of darkness" with the electric cable in its bed. If the source of light and heat is not to do so in the course of the present summer, we have that faith in the stubbornness of John Bull to believe that he will never cease until that magnificent project is effected.

Let the subject remain then for a short time with its present designation as an experiment,—let it be surrounded by doubts and chances of failure or success,—let it be numbered among the undetermined problems and like many other questions affecting human aggrandizement await decision as those do which are yet abiding "the glorious uncertainty of the law." But when its turn does come let it have fair play, and we will venture to say not only will the chances be in its favour, but that it will eventually be done. Not that our opinion is backed by belonging to those who have entered largely into the "experiment" as a speculation, and who by their own voluntary convictions hold all the objections of practical men as mere trifles: although they have given substantial proof that they think lightly of them and believe, as we do, that the great feat is not only practicable but will eventually be accomplished.

While the subject is thus lying in abeyance let us again turn to the consideration of some of those singular features such as were contemplated in our last number. And let us look some of the adverse circumstances in the face, as we can do without being under the imputation of having an eye to business.

Most assuredly the promoters of this important enterprise are under much obligation to the Astronomer Royal, Mr. Airy, for his scientific investigation of the whole question of depositing the cable. In the results at which he has arrived and communicated to this journal he has placed the danger points in a practically useful point of view, and these divested, as he has said, from all algebraic display. Doubtless, it was evident enough to any seaman that the nearer a cable or hawser approached to a straight line between two points, one at which it is fast and the other end at which a drawing strain was exerted, the greater would be the amount of that strain; and no less evident is it also that as the cable is being delivered over the stern of a ship as she moves through the water, the strain on that cable would be increased the nearer it is made to approach the horizontal line, or, in other words, the smaller the angle which it makes with the horizontal plane. All this would be evident enough to seamen, but the amount of strain it would have to bear between the conditions of rest and the maximum strain to which it would be submitted, and thence the amount of danger incurred, was a question demanding all the resources of the man of science, especially when the weight of the cable, reduced by immersion, and the effects of friction, contribute elements tending to increase its difficulty. By a reference to the table furnished by the Astronomer Royal the proportionate enormous increase of tension to which the cable will be subject becomes at once evident practically by the decrease of the angle at which it takes the water, and proportionately by the number against each angle, and this latter we look on as the most important guide to which the attention of those charged with veering the cable can be directed. It is, in fact, supplying them with timely warning, and it would be a good provision against this serious source of accident if a graduated board showing the different angles were placed, by the side of which the cable would have to pass, with

those angles less than the limiting angle progressively marked "danger increasing." Thus, the persons charged with the duty of veering, should an acceleration of speed in the ship arise from a temporary increase of wind (common as it is known to be in affecting the rate of sailing) would see at once when the cable is approaching the angles of danger and would veer accordingly to keep it down,—attention, in fact, being incessantly directed to this duty, so that they may accelerate or retard the issue of the cable as the speed of the ship varies, and preserve it constantly at the angle of safety. Perhaps in consequence of the incessant and sometimes violent movement of the ship there will be difficulty in observing it, as the cable, owing to that, will be constantly passing through a large range on each side of it. But all seamen know that a series of violent movements is often interrupted by a "lull," as, it is called, of quietness; not long, perhaps, but quite long enough in which to observe correctly the angle which the cable is really making, and then to veer accordingly. Indeed, veering beyond the speed of the ship seems to be almost a necessity, and always the safer course in a seaway. But in smooth water, where the ship is comparatively quiet, the rates of veering and sailing may be approached with more safety; and yet it must always be observed in respect of this that there are inequalities in the surface of the bottom that the cable has to take, and which will always require a surplus delivery over the speed of the ship to enable it to accomplish.

Far more perplexing than this fair play, we may call it, for the cable, will be that condition when it is going out at an angle with the line of the ship's course,—an evil which occurred last year and occasioned, we are told in the report, considerable uneasiness to the engineer. And are we not to expect the same again? Most assuredly so.

In this case we should at once assume the cable to be the correct index of what is going on, because we may suppose the further part of it to be on the ground and that the ship, although perhaps on her proper course, is under the effects of a current drifting her off her proper *track*. A little bit of current sailing in such a case would surely set things straight, and by keeping the ship on another course would bring the cable eventually right again, for, after all, currents are very partial to certain localities. Thus, if while the ship is making an easterly course it is found the cable is drawing or growing, as seamen have it, to the northward, we should consider it a sure indication of a southerly set, and agree to compromise matters with it by immediately steering more northerly on a course different from (in this case to the left of) the real one, veering away the cable, for checking is dangerous; and we should expect thus soon to bring the cable aft again into its proper direction. In fact, by making the cable the index of its own fair treatment, we should expect to make the least deviation possible from the track really intended for it. We may be mistaken in our view of this subject, but with two facts before us, viz., that the cable is on the ground and the ship is on the surface we cannot see it in any other.

One of the most important recommendations of the Astronomer-

Royal is that of delivering the cable at a speed rather greater than that of the ship, and in our own judgment the speed of the ship should never exceed five knots. It is clear that by observing the first condition the cable is subjected to the least possible strain, besides which the surplus of length of cable over distance run goes to filling up inequalities of the ground, on which it should lie and not hang across the hollows of its undulating surface. An excess of ten per cent. for this would not be too much. And again, considering that the cable will require time to reach the bottom for it will sink at a rate depending on the excess of its specific gravity over that of the sea water, it is better that it should do this while the ship delivering it is not far away, when it will show by the decrease of the terminating angle that it requires more to fill those occasional hollows of surface which it would have to lie across from the great length that would be out if delivered at a high rate of speed, as the weight of that length would not admit of its timely sinking so low as to adapt itself to these hollows, and it would, therefore, be obliged to hang across them. It is on this account that we should object to a lighter cable, for the lighter it is the longer it would be in reaching its final bed, and, in our opinion, the sooner it arrives there the better. Although there may be no great importance in observing this condition generally, we still look on five knots as a sufficient rate of sailing for the ship, and even if this small rate be fairly maintained throughout, the work will be done within a week when the two ships part company!

There is yet one particular which may not be unworthy of allusion while on the subject of speed, in the occasional acceleration of it by the freshening of the breeze. The constant watch which will be kept on the cable as it goes will immediately detect the effect of this in the tightening of it and allowance will be made for it by veering. In fact, the most vigilant attention will be required to watch over this particular, but especially by night; and for this purpose we have no doubt that a light will be so applied as to enable those charged with the duty of watching the exit of the cable to see its condition by night as well as by day—for it must not be forgotten that confusion is the too common companion of darkness. But the chances of danger are happily reduced to their minimum by two very important particulars connected with this part of the business in hand, and these are the shortness of night and the certainty of the water shoaling, to say nothing of the probable direction of current and run of the wave. It will be a gratifying reward to those charged with these duties to find the cable giving symptoms of being in shoaler water by increasing its angle of taking the water, showing that it is kindly moozling itself into the final bed beneath the ocean for which it is intended—however rough and uneven that may sometimes be.

Thus, then, we see the very few particulars essential to success: the constant fair inclination and direction of the cable, along with its perpetual delivery from the moment of its first commencement after the union of the two ends is completed. There must be no over-riding of parts, no stopping the delivery, and all must go on smoothly, cau-

tiously, and steadily from the commencement to the end, and all this, by the attention of those concerned and the means provided, we have no doubt will be secured. But in regard to preparations we read the following in the papers of the day:—

The arrangements preparatory to making another attempt to connect Europe and America by telegraph during the present summer, are progressing actively.

The cable, which has been stored during the winter in the tanks erected by permission of the Government in the Keyham Steam-yard, Devonport, is now being coiled on board H.M.S. *Agamemnon* and the U.S. frigate *Niagara*, both of which ships have again been devoted to this work by their respective governments. Up to yesterday 320 miles had been coiled on board the *Agamemnon*, and 84 on board the *Niagara*. A large number of men are engaged in the coiling from the hours of 5h. a.m. to 7h. p.m. every day, except Sundays, and the whole is expected to be on board by the 10th of May. The additional 300 miles of cable, recommended by the directors in their report to the shareholders, are in process of manufacture by Glass, Elliot, and Co., a sufficient amount of the new capital having been subscribed for this purpose. It will have been completed and coiled on board by the second week in May.

The scientific committee appointed to consult and carry on experiments with regard to the paying out machinery have at length so far decided upon the principle of the sheaves and retarders to be used on the present occasion as to be enabled to order one complete machine, which will be finished in about a fortnight, and which will then be set up at the works of Messrs. Easton and Amos, and subjected to severe experimental tests.

When this is done, it is the intention of the directors to invite by circular as many engineers and machinists of known ability and eminence as possible to visit and inspect the entire apparatus during a certain fixed period, and to solicit as a favour their critical observations and suggestions upon its form and construction.

If no good cause be shown for further important alteration in the machinery, it is intended that the *Niagara* and *Agamemnon*, which it is estimated will have been completely fitted and ready by the last week in May, shall, before commencing to lay the cable, proceed to sea, and in the deep water, about 300 miles from the Irish coast, rehearse a series of experiments in paying out and hauling in, and put to a practical test several suggestions and appliances that have been proposed to the company by various ingenious persons who have taken an active interest in the success of the enterprise.

The two ships will then return to England and report progress, and under this arrangement, should the experiments show that important improvement or alteration is desirable in any of the apparatus, there will be time to get it effected so as to enable the expedition to make their final start at a period of the year when, according to the unanimous testimony of all whose experience of the weather in the North

Atlantic has been consulted, the sea and air are likely to be in the most favourable condition for facilitating the success of the undertaking.

The *Agamemnon* is now being put in commission, and will be commanded by Captain George W. Preedy, and the Admiralty have, in addition to the *Agamemnon*, appropriated the *Gorgon*, Commander Dayman, and another paddle-wheel steamer, to the service of the Atlantic Company, the latter as auxiliary to the *Agamemnon* in case of her needing assistance, and the former to keep the sailing course, there being a possibility that the compasses of the ships containing the cable may be affected by the proximity of so large a mass of iron.

It is expected that the United States Government also will shortly despatch to England a large paddle-wheel steamer on a similar service in respect to the *Niagara*. Thus there will be a total of five ships of war engaged on the present occasion to realise this great international work.

In the electrical department the directors have called to the aid of Mr. Whitehouse the services of Professor Thomson, LL.D., Mr. Walker, F.R.S., and Mr. Henley.

It is also their intention to consult other electricians and telegraphists, with a view to secure the greatest attainable amount of speed in working through the cable, and the best practicable form of apparatus for transmitting signals.

The manner in which the cable is stowed in the ships so as to run off from the coil over a central core is excellent, requiring no capsizing of bends, so well known to seamen, to add to difficulty, and, thereby, to risk of accident; and its register of length as it goes out, as well as the control obtained over it by means of cylinders and apparatus for exerting that control without touching the cable,—all this is excellent and contributes to the resources of those charged with the all important duty of depositing the cable, which, considered with other conditions already alluded to as being apparently sufficient to secure that success which is so warmly anticipated.

Considering, then, all these preparations to have been completed as perfectly as they can be desired in the interval which has elapsed since the failure of the attempt last year, and scrupulously approved of to the very parties who are to have the management of them, let us turn to those further interesting considerations that present themselves when assuming that the great work of laying down the cable is actually completed and Europe and America are in electric communication with each other. Then comes the question of the electricians. What will be the effect of the submergence of the cable on the rapidity of the messages? This would appear to be the second part of the experiment, depending for its solution on the success of the first. The doubts which seem to have arisen as to the loss of the electric power by the submersion of the cable, from failure of insulation, imply evidently a distrust of the gutta percha covering and of the recorded opinion of Professor Morse that will be found in our June number of

last year (page 293), and therefore, notwithstanding the professor has foretold that ten words per minute may be considered as the working power to be gained, the word experiment meets us again and we must be content to let it remain a little longer among the desiderata of science. Although the electric spark, it is admitted, finds its way readily enough through the whole of this Atlantic cable as it is lying coiled in the ships, it has not done so when in its extended condition in the bed of the Atlantic. This is undeniable. But, provided the insulation continues as perfect as now—and why should it not,—what else is there to prevent it? As for pressure from submersion affecting it, we have a better opinion of the powers of the gutta percha to believe in that, and are quite contented to abide the result of the second experiment, satisfied with the opinions that have brought the whole undertaking to its present advanced condition.

We shall gain some insight to the general condition of electric communication, actual as well as anticipated, by a reference to the proceedings at the first ordinary annual meeting of the Atlantic Company that took place in February last, at which it was determined to add 400 miles more to the cable, thus increasing it to 2,900. This might be no doubt a wise and most provident measure, but we shall not be surprised and indeed expect to hear of about 600 miles of this cable being usefully applied hereafter to some other line as overplus from the Atlantic. But in reference to the subject of electric communication generally, we find the following interesting remarks made by Mr. Christopher Bushell, the President of the Chamber of Commerce at Liverpool.

"Certainly there is nothing," he observed, "in past events to derogate in any degree from the importance of electric communication; whether we look to India, and the fearful results which have taken place there, or to America, and the panic from which we ourselves have so deeply suffered, it is not too much to say, that had electric communication been full and complete between those two great nations and this country, most of the calamities that happened both on one side and the other might have been, if not altogether averted, at all events very greatly mitigated in their severity. I am sure you will permit me, therefore, to touch for a few moments upon this portion of our subject.

"In passing through one of the streets of this great city last night, I came suddenly and unexpectedly on a stream of light which illumined every object for a distance which to me, without thinking for the moment of the cause, was perfectly incomprehensible. Every object for an extended space was thrown into sharp outline. Of course, as is ever the case when something not common is brought before the public gaze, a crowd had collected, and as I approached nearer to the spot, I found that an electric light was streaming from one of the upper windows of a house, and, in consequence, every object for a distance, as I have said, was thrown into full relief. The light of the gas,—that power which we have so much rejoiced over, and which has been

the source of so much happiness and comfort to us all,—seemed dimmed and paled in the presence of that new effect on which I looked. It occurred to me that that light was but a physical type of the vast intelligence which that same tiny spark is destined to spread throughout the face of the whole civilized globe.

"I was about to observe that mind is only powerful by its influence upon matter; that it can only be really powerful when those sources of intelligence are open to it, which shall enable it to draw a sound deduction from the information which is conveyed to it, and that that information should be of a diffusive character, and gathered from various sources, is certainly a matter of the deepest importance. Looking to the effect on government we shall see that if the events of the whole world can by any process be brought, at one concurrent period, under the notice and supervision of a body of men sitting round a table in London, New York, or elsewhere; if the whole game—political, social, and commercial—of all the great nations and states of the globe can be developed, move by move, and placed instantaneously, as it were on a chess-board, in the sight of all the players of the game; if this can be accomplished—and a complete and perfect system of electric communication *will* accomplish it—then it is perfectly clear that science will have achieved for intellect a new power which no human mind until recently could have contemplated, and the results of which experience only can make known.

"Thus it is that we hope to be enabled by means delegated to us by Him who gave us intellect, to avail ourselves of that world-wide intelligence which shall make that intellect more and more abundantly useful. To contemplate, then, the effect which may be produced when electric communication shall be perfected—as I believe it will be, because I believe that it is intended—is beyond our finite powers of understanding. Even in the present fragmentary condition, so to speak, of this great work, we see something of its effects, something of its wonders, something of its usefulness; but when that fragmentary work shall have become a whole,—when the statesman shall have his chess-board, the merchant his electric telescope, and when each can watch that portion of the game in which he takes an interest, and can see at one glance the events which are concurrently taking place in every portion of the globe where civilization, capital, and energy are congregated together,—when all this is achieved, it will be difficult to conceive what will be the effect upon the world at large, and upon the Anglo Saxon race in particular, resulting from the privilege which I believe is about to be confided to us. The subject expands so under reflection that I feel it impossible to deal with it as its importance merits; but I throw out these few observations with the view of suggesting what may be accomplished from a consideration of what has been already done."

The picture here drawn by this gentleman is one of the most sublime and at the same time practically valuable that imagination can conceive. Verily science has contributed marvellous secrets to man,

intended by his Creator for the exaltation of his mind, to lead him to contemplate, and when lost in wonder and amazement at the truths which it reveals, to bend in humble and fervent adoration to the great Incomprehensible Author of all that perfection which he beholds. And the electric telegraph in its extended application here alluded to may well take its place among those marvels, owing all its greatness to the simple application of its mystery, for of what fire is that electric spark composed. Be that as it may. With the assistance of the worthy president whom we are quoting, we will proceed with its application. He says,—

"I wish to bring under your notice some circumstances which have been communicated to me in relation to the present position of electric communication, showing what has been done, and what may be effected if energy be devoted to the work. I find that the Atlantic Telegraph, once laid, will connect every commercial city in Europe with every commercial city in the United States and British North America. Arrangements are in progress for laying the cable from Florida to Cuba, so as to connect both countries with the West India Islands, and to extend a line from the Mississippi River to San Francisco, thus affording electric communication between London and the shores of the Pacific. Lines are completed from London to Malta and Corfu, and we may hope that they will soon be laid to Alexandria. The line from Alexandria to Suez, across the isthmus, is already completed, and a company has been formed to extend that line down the Red Sea, and from Aden to Kurrachee, in India, thus connecting the great Indian Empire with London. From India the line can soon be extended, if we wish, to Canton, in one direction, and to our great Australian Colonies in another. Thus, by a most simple, and with reference to the end to be obtained, most inexpensive machinery, India might and ought to be within twelve months from this day brought into direct and immediate electric communication with London.

"If success be permitted to the undertaking in which we are more immediately this day concerned, I am informed that within two years the whole of this plan which I have thus imperfectly sketched might easily be accomplished. Within one year our communication with India might be completed, and in two years with the whole of the Western world. Such then is the work in which we are engaged. I don't know from what point of view this matter could be considered—whether by the statesman, by the philanthropist, by the soldier, by the merchant, and last, but not least, by the student of divine law and divine providence—which can, in the slightest degree, derogate from its importance. I believe myself, and I speak I trust with due submission, that we may regard this electric communication, in effect, as a new creation—a creation which seems to have said for a second time, 'Let there be light,' and there is light. I believe, sir, that that light—the light of intelligence—will be so diffused throughout the whole world, that intellect will have given to it a power, by reason of the information it will receive, which will prevent its falling into those difficulties

and dangers which want of intelligence has often caused intellect to fall into."

Since the foregoing observations were made in regard to the West India Islands, we believe that a project is already entertained for carrying a line of communication throughout the whole chain in connection with that alluded to in Florida; this will eventually find its way to Panama, and thence both sides of South America and all its principal cities, will be in electric communication, while the shores of Mexico and California will receive their share of attention, and await the lines which will find their way from places on the Asiatic Continent in connection with India by the Red Sea, through Singapore, Java, the Moluccas, and Australia, through a few connecting points of the Pacific Ocean.

In reference also to the Mediterranean, the line from Sardinia to Malta, as well as from Sardinia to Corfu has been completed, and that down the Grecian Archipelago to go by Candia to Alexandria, will shortly be completed. And with the view of showing the various lines of submarine telegraphs at present in operation, we are enabled, by the attention of Mr. Forde of the Adelphi to add the accompanying statement. The number is few, but submarine electric communication is yet in its infancy. Every day if not adding fresh lines is fostering and encouraging the germs of that general system which will ere long embrace our globe *per mare et per terram* in one complete electric current.

Before concluding these observations, however, there is one feature attending the project of which we have been treating that must not be passed unnoticed, being a novelty in the management of companies, and highly creditable to the Atlantic Telegraph Company. Doubtless the extraordinary importance of establishing the line across the Atlantic is felt to be of prodigious importance, and no doubt other companies consider these early steps of importance likewise; but the concluding paragraphs of the proceedings at the meeting to which we have alluded are as follows:—

Mr. Field, from whom we learn that "the fortunes of many firms really broke with that cable when it snapped on board the *Niagara* in August last,"* in acknowledging the thanks of the meeting, said,—"I feel, gentlemen, that I have scarcely time to eat, drink, or sleep, and none to make a speech; but I assure you that all the energy and little talent which God has given me shall be bestowed between now and next June in endeavouring to carry out this enterprise; and it will give me great pleasure, when I am in America, to talk through the cable with ony of you upon this side of the Atlantic. Before you separate I hope that you will pass one resolution for me—it is a vote of thanks to the Directors of this Company. I am not a Director; but I know something of companies on both sides of the Atlantic, and I may safely say that I never knew a company in which the Directors worked so hard, and exhibited so little of selfish motive, as in this.

* Page 12 of Report of Ordinary Meeting.

Your Board comprises gentlemen in London, Manchester, Liverpool, and Glasgow, and day after day I have seen almost every member attending the meetings of the Directors, not for the sake of putting a guinea a day into their pockets, for they are above that; but from higher motives and loftier considerations. Your Directors have never received a farthing of your money, and I hope that the meeting will unanimously pass a vote of thanks to those gentlemen."

"Alderman Rose.—I beg to second that resolution, and to express my sense of the obligations that we are under to our Directors for the untiring zeal which they have brought to the discharge of their very important duties. We sympathize with them in their mortification at the want of success in the first instance, and we acquit them by this vote of thanks of all blame. We think that they were urged by perhaps a little undue anxiety to get the cable laid without having taken proper time for experiments. We give them our most cordial support, and we hope for success in the efforts which will be made this year for carrying out this great undertaking."

Such traits of character we say are honourable to the parties named, and induces in all generous minds not only sympathy for their former failure but a hearty and cordial desire for their ultimate success.

Table of Submarine Telegraph Cables laid or lost up to May, 1858.

Destination of Cable.	*Length of Cable in stat Miles.*	*When laid.*	*In whose hands.*
1 Dover to Calais	21	25 Sept. 1851	Sub. Tel. Co. L.L.C. London
2 Dover to Ostend	59	4, 5 May '53	Ditto.
3 Portpatrick to Donaghadee	24½	May	Eng. & Ir. Mag. Co. L.L.C. Liverp.
4 Orfordness to Scheveningen, No. 1	114½	30, 31 May	Electric Tel. Co L.L.C. London
5 Ditto Ditto No. 2	114½	16, 17 June	Ditto.
6 Cronstadt to St Petersburg	4½	August	Russian Government
7 Orfordness to Scheveningen, No. 3	114½	8, 9 Sept.	Electric Tel. Co. L.L.C. London
8 Isle of Wight	1	10 Nov.	Ditto
9 Granton to Burntisland, Frith of Forth	5	22 Dec.	Ditto
10 Across the Tay	1	24 Dec.	Ditto
11 Spezia to Corsica	110	June, 1854	Med T-l. Co. *Soc. Annonyme*, Paris
12 Holyhead to Howth, No. 1	58½	4, 5 Sept.	Electric Tel. Co. L.L.C London
13 *America and Newfoundland*	150	*Sept.* 1855	*Newfoundland. Lost in laying*
14 *Balaklava and Varna*	350	*May*	English Government. *Since cut and*
18 *Miles at each End of Ditto*	36	*May*	*materials sold to Turkish Gov.*
15 Holyhead to Howth, No. 2	58½	13, 14 June	Electric Tel. Co. L.L.C. London
16 Orfordness to Scheveningen, No. 4	114½	29, 30 Sept.	Ditto
17 Varna and Constantinople	180	October	Turkish Government
18 *Balaklava and Eupatoria*	40	*October*	*Cut. Laid by Engl. Government during Russian war*
19 Cape Breton to Newfoundland	85	Aug. 1856	Newfoundland Telegraph Company
20 *West of Ireland to Newfoundlnd*	340	*Lost*	Atl. Tel. Co. 340 *miles were laid when fracture took place*
21 Cagliari to Ilona	180	Sept 1857	Med. Tel. Co. *Soc. Annonyme, Paris*
22 Ditto to Malta	440	Nov.	Mediter. Ext. Co. L.L.C. London
23 Malta to Corfu	450	4 Dec.	Ditto
	2,802	Total length of Submarine Cable laid.	
	916	Lost or broken.	
Those in Italics are not in action.	1,986	Total length of Submarine Cable at work.	

On the Progress of the English Lighthouse System.—*By A. G. Findlay.*

(Concluded from page 250).

I now come to a very important point in the present subject. In 1832, Lieutenant Drummond proposed the use of the now well-known oxy-hydrous light for lighthouse illumination, and an extraordinary instance of its power was given at the time, showing that such a light, seventy miles off, appeared nearer to the observer than an ordinary lighthouse lamp and reflector twelve miles off, an irrefragable proof of its superiority if it could have been managed with certainty. But, notwithstanding the most careful study and the most ingenious contrivances, it has been found impossible to maintain the light with that steadiness which is absolutely necessary for lighthouse purposes.

Ten years since hopes were raised that the electric light would be so far perfected by Messrs. Staight and Petrie as to supply this most desirable improvement, but the difficulty in maintaining the light in its normal character led to its abandonment.

It has been carried to greater perfection under the arrangement of M. Duboscq, and is in general use in our philosophical experiments, but it requires delicate management. The principle is that of passing the electric current between two vertical pencils of carbon. I am much indebted to Professor Goodeve for kindly exhibiting this beautiful light, which, as you see, when applied to the holophotal lens apparatus, has a most powerful effect. Mr. C. W. Harrison has made a different arrangement, which obviates the inconvenience of maintaining the exact distance between the two points, which is the main difficulty in the vertical lantern, by making the positive one a cylinder of carbon, which, by revolving under the negative point, presents a constantly fresh point to the action of the current, passing in a spiral direction from one end of the carbon cylinder to the other. I believe that this is the first time it has been exhibited in public, and certainly it has a very promising commencement, and its failure in application is to be regretted.

There are two great difficulties in solving the problem of a steady light from electricity. The first is in maintaining an equable force from the producing elements, that is, the battery, which, of course, will gradually decline in power after a short time, and no means have, as yet, been devised for so thoroughly obviating this, as to keep up for the many hours that the light must be shown. The next is at the outlet of this current; in preserving that exact distance between the two points of carbon, through which the arc passes, which maintains the light in its normal condition. These carbon points are usually, I believe, formed of graphite, the substance which is found lining the inner surface of old gas retorts. The rapid disintegration of the positive pole, the less diminution of the negative pole, and the irregularity of the consumption of both under the intense action, have baffled the ingenuity of almost all who have attempted to control them.

However, I am happy to say that I hear that the problem is about to be solved, and that ere long, probably, the electric light will be established at our finest lighthouse. This will be the greatest advance that has been made in pharology since the introduction of the existing system, which, in principle, may be said to have been perfect at the outset.

It is to the talent and patient ingenuity of Professor T. H. Holmes that we shall owe this grand improvement, and I much regret that the nature of the apparatus precludes the possibility of exhibiting it, but those interested will, I dare say, soon have an opportunity of examining it elsewhere.

Mr. Holmes has adopted another form of originating the current than has hitherto been tried—that of magneto-electricity. The whole apparatus and its results are an admirable exemplification of the correlation of the physical forces—an evidence that one power may be traced throughout a train of operations until it emanates in a totally different form. The apparatus consists, I believe, of a series of very powerful permanent magnets, around the poles of which the helices are made to revolve by means of a steam-engine, and from the extent of the primary arrangement a most powerful magnetic current is produced, which passing through the carbon pencils, shows that splendid light which entirely eclipses all other modes of illumination. I am not aware of the method by which Mr. Holmes regulates the distance between his electrodes, but the light exhibited last year before the Trinity-house authorities maintained a perfectly steady appearance for several hours, and doubtless might have been continued for any period. It is intended, I believe, to show the light from more than one point, so that it may be renovated without eclipsing it altogether, and even this changing of the electrodes is to be effected instantaneously.

This branch of our subject is worthy of the special attention of the Society of Arts, and an evening might well be devoted to the consideration of its merits. When once the system of illumination by electricity or any other similar light is practically established, we shall have an immense advantage in the capability of the lighthouse system for distinguishing one light from another, a desideratum which is even of more importance now than when the lighthouses were first placed on a proper basis—in fact this branch of it has remained nearly stationary from its origin.

The totally distinct character and colour of the electric light, will at once distinguish it at any distance from that derived from any other source. Therefore, supposing that this illumination be adopted as an adjunct to that in present use, the stations in which it is applied will be distinguished from their neighbours without the chance of mistake, the fruitful source of accident from the present lights.

Respecting the power of the magneto-light, I have not met with any recorded photometric experiments applicable as a comparison; such comparison with the oil-lamps, however, could not be very well made. I have cited the experiment made by Lieutenant Drummond; the electric light is more powerful than his light, and I am informed

that its penetrative power through a hazy atmosphere is, as compared with the light apparatus in use, 75 to 1; so immense an advantage in the first principles of the utility for lighthouses cannot be overrated. The only comparison which can be made, as it occurs to me, is that afforded by the heliostadt, the instrument for solar reflection used in extensive trigonometrical surveys. This reflection pierces the atmosphere to a vastly greater distance than the object on which it is shown, and might be taken as a measurement of the effect of this light.

In its use and in thus economising the power there must be some modification of the optical arrangements now applied. The light, not one-quarter of an inch in diameter, would be entirely shut out by the frames of the lenses, or the bars of the light-room. It is probable that some refined arrangement of the Bordier-Marcet apparatus will be found to be the best. The action of the reflector I have already explained. It was largely used in France, but, as far as I know, is only applied to one station in our own country, Ardvishaig, in the West of Scotland.

If a dioptric apparatus be chosen to economise this minute light, it must be of a very refined description, as any defect in it will be developed in its action on account of the smallness of the source of light, and any dioptric fringes, of course, will deteriorate its value, as the red or green rays, at a distance, might cause it to be mistaken for a red or green light. With more than one light, the chances of this will be avoided. There would be no necessity for a light-room for this light. A simple cylinder of glass, of sufficient diameter, would be the best form of protection, and a revolving wiper would keep the glass clear either within or without.

There is one proposition for distinguishing one light from another, which would be readily carried out if it were considered to be desirable, in electric illumination. It is that of the numerical distinction of Mr. Babbage. He proposes that each light should be masked at certain intervals, in such a manner that the light should tell its own number. Thus, being suddenly eclipsed three times at short intervals, then a pause, then twice suddenly eclipsed for a short period, would indicate No. 32, &c., the numbers to be arranged in a certain order. The simple breaking contact in the magnetic current will produce the eclipsing effect, but any extended intervals of time in such matters are considered objectionable.

Lieutenant Raper, in his admirable work, proposes another method of showing a light for sea purposes, that is, by illuminating the clouds and haze over the station by the electric light. This shaft of luminosity might be inclined in various directions, or it might be made to revolve by proper optical arrangements, and this would give a great relief to the already exhausted resources for varying the appearances of lights; but there is one case which might render this system of no avail, and that is a perfectly pure atmosphere.

I wish now to draw special attention to another topic, which I think has a most important bearing on our present subject. It is the ques-

tion of the lights carried by steam-vessels, which I shall be able to show is daily causing more and more confusion in the capabilities of the lighthouse system, and by diminishing its efficiency is introducing a fresh element into its requirements.

On December 15th, 1847, the day on which my former paper was read, an order was issued by the Board of Admiralty, arising out of a careful series of trials and evidence, that all H.M. steam-vessels should be fitted with a bright light at the mast-head at all times, and when under steam to show, in addition to this mast-head bright light, a green light from the starboard bow, and a red light on the port bow. This system had been adopted previously by our principal steam-packet companies. On January 1st, 1852. an Act of Parliament came into operation which rendered it imperative on all steam-vessels to adopt the above system, which was also carried out by the governments of the principal foreign maritime nations. The object of the red and green lights, which are so screened as not to be visible except on their own sides, is to show to passing vessels the direction in which the steamer carrying them is going. In the Thames, above Yantlet creek, a more simple lighting of steamers is adopted, consisting of a foremast-head light, and a bright light at the bowsprit end or in the bows. These arrangements, if properly carried out, answer all the purposes required of them.

But the requirement has led to such improvements in the manufacture of these steamers' lights, that they rival in excellence and brilliancy the lighthouses and light-vessels that are established for their guidance, as may be readily comprehended by comparing the examples of these mast-head lights with the reflectors of our light-vessels. No judgment can be formed of the distance of a light, unless its absolute brilliancy be known, and there be no obscuration.

These excellent lamps may be, and constantly are, mistaken for the guiding lights on the shore, and many fatal examples might be cited of such an error. One very recent will suffice:—The *Læander*, an American barque, proceeding down the St. George Channel on the night of February 11th, 1858, saw a light, which was taken for that of the Tuskar Rock. It was afterwards discovered, when too late, that it was that of the screw-steamer *North America*. A fearful collision then took place, and the unfortunate ship and nearly all her crew were sent to the bottom in a few minutes.

In Mr. Wilkin's lamp the dioptric belt in the middle is precisely a portion of Fresnel's fixed light apparatus, and is of equal beauty with that refined system. Its action, after what has preceded, will be very readily comprehended. It is exactly a resemblance of a large light-house or a harbour light.

The question of steamers' lights is again under discussion, and a bill will be brought before Parliament forthwith for its further regulation, but the source of confusion I point to cannot be obviated, and it demands some consideration, in a primary sense, whether the whole system does not require revision. In the case of the Nore light-ship, the oldest of its kind, it was found necessary to change its fixed light

to a revolving light; it could not otherwise be distinguished from the very numerous steamers so frequently at anchor near her, or passing in or out of the Thames. In some cases a red light has been added to the floating light, but this is ambiguous, as the steamer under way will carry the same appearance.

I have but little to add to my former remarks on the subject of the structures for exhibiting light. When Smeaton constructed the Eddystone, he established a principle on which all similar structures in our country, the Bell Rock, the Tuscar, the Black Rock, the Skerryvore, have been erected. The pile lighthouse in an exposed situation, as attempted at the Bishop Rock, the westernmost of the Scilly Isles, and on Minot Ledge, Boston Bay, Massachusetts, has not been found to answer. Mr. Alexander Gordon, however, among the numerous colonial lights he has erected, and is still superintending, has introduced some new features. The fine iron tower on Bermuda has been copied for several other stations, one of which, for the Bahamas, till recently reared its head near the Regent Canal. In a lighthouse now being built on the Roman Rock, Simon Bay, Cape of Good Hope, he has made the flanges of the iron plates of the lower part of the tower external, and the spaces between these flanges are filled with Trinidad pitch, which affords a perfect protection from the action of the sea on the iron. He has proposed a tower with a leaden base for the dreaded Skerki Rocks, in the Mediterranean. In the important lighthouse of the Basses, on the South coast of Ceylon, an iron tower is constructed, around the base of which a granite casing, fitted together in this country, is being built, affording a martello-tower-like protection from the tremendous sea, and a habitation for the keepers. A lighthouse with perpendicular sides perhaps would obviate some of the drawbacks to Smeaton's system. The sloping base of these towers leads up the waves, and in the case of the Eddystone, in 1838, the coping was much injured by an enormous wave, which mounted up the side of the tower. We might find numerous examples in nature of such a column withstanding the tremendous shock of the ocean-waves, one of which, the St. Peter or Black Rock, to the south-east of Japan, on the chart, affords a good example. The admirable wooden structure on the Eddystone, erected by Mr. Rudyard, in 1706, may also be cited. This might have existed to this day, but for its unfortunate destruction by fire in 1755. Mr. Gordon, in using wood as a material for lighthouses or their adjuncts, proposes to use Mr. Maugham's patent for its preservation. This consists in boiling the wood, for a few minutes, in a saturated solution of phosphate of ammonia, under a pressure of 20 lbs. to the square inch. The rationale of this process is, that every pore of the wood becomes saturated with oxygen, and therefore no chemical action of sea-water will tend to its decay.

I have thus described, briefly and imperfectly, the main features of our lighthouses—their progress towards perfection, and their present condition. All that I have alluded to is in present operation, with the exception of the electric light, and that may be said to be accom-

plished. I have shown that every refinement and economy in the illumination has been attained, and that more cannot be expected in that direction than we at present possess. All these matters refer to the progress and improvement of its details—I have had no new principle to describe to you, with the exception of that great step, the magnetic illumination; in other respects it remains the same as when William Hutchinson constructed his reflectors, or Rogers erected his lenses in the Portland or North Foreland lighthouse. In the meanwhile, another system, antagonistic to its efficiency, is daily growing into permanent importance. The wonderful advance of steam and auxiliary steam, as applied to our ships, developes a new phase in navigation, and our crowded channels are now traversed by this class of vessels, whose voyages are made and completed with the speed and certainty of our railway-trains. The pressure of modern times will not allow the commander of a steam-vessel to exercise that slow caution which was the safeguard of the mariner in former years. It was thought that, when all the dangerous points of our coasts were indicated by lights, that this "hand-rail" up the Channel would be a perfect help and security at all times. Now, however, each steam-vessel carries those false lights which, like those of the wreckers of former times, may only lure to destruction.

These considerations naturally lead us to revert to first principles—to inquire whether our lighthouses, as a system, are as near perfection as is required—if not, in what direction are we to look for future improvement?

The English and St. George Channels are the greatest maritime highways of the globe; their dangers and difficulties are but a type of all others; but they are better known, and moreover they are, as has been observed, as "well lighted as Regent-street." Yet an inspection of the two charts will tell a tale more impressive than any words I can say. The one exhibits the localities on which total wrecks only took place in the English and St. George Channels, during the years 1852, 1853, 1854, 1855, and 1856. The other, of similar character, shows the localities where collisions (the growing evil) have occurred during the same period. A cursory glance at these charts conveys the same sort of information as does the enumeration of the killed and wounded in some great battle. Yet each figure in the one, and every black dot on the other reveals an amount of personal misery, of suffering, and the entailment of such an accumulation of sorrow and privation to thousands, that each one of them might easily form the text of a thrilling tale.

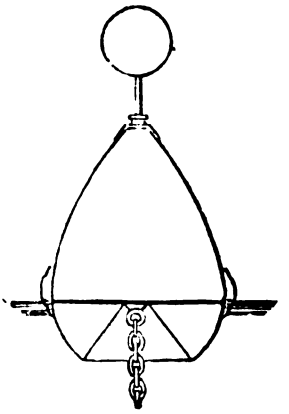
On a little closer examination a singular fact presents itself; it is, that the great majority of wrecks and collisions occur in the immediate vicinity of the lighthouses intended to guard against the dangers around them. There can be no doubt of this very important fact; and it may be readily accounted for by the universal practice of all ships, as far as possible, sailing along the coasts within sight of the lights, taking a fresh course at each point, when the general trend of the coast changes its direction. The numerous chances of error in a

ship's reckoning then place it in constant peril from the proximity of the dangers it is desired to avoid. I have previously shown that our fixed structures have been pushed as far forward into the sea as human means could build them.

Many calamities have demonstrated that a mid-channel course, without very great caution, is a hazardous proceeding, especially to inward-bound ships. The reasons for this are, the varying direction and rate of the tides, which, however, are now better known and guarded against, and the local attraction of the ship herself upon her compasses. This latter unheeded source of danger has led to many losses; the mid-channel course is at right angles to the magnetic meridian, and, therefore, this element of erroneous reckoning is at its maximum. Its tendency in an up-channel course is to draw the ship's head to the southward, and hence the very numerous and distressing wrecks on the French coast South of Boulogne, of which those of the *Reliance* and *Conqueror* may be cited as well known examples. These disasters would have been averted had any fixed mark certified the commanders of their exact position and courses.

It is then, I believe, to floating structures we must look for future improvements in pharology. Our light-vessels, as at present constructed, and as I have shown, are quite incompetent to fill any important station in the system.

The desideratum is supplied in the principle proposed by Mr. George Herbert, which I will briefly describe to you without going into those questions of wave-power and other collateral topics which may be well discussed elsewhere, or in alluding to the fallacies in principle which are at present applied to our floating beacons. The conditions required for a floating beacon are that it should keep upright to be most efficient, and for a floating light that it should, in addition to this, be free from any violent oscillation, such as is experienced by ordinary vessels. Mr. Herbert effects this by mooring his beacons, which are of circular form, from their *centre of gravity*, which is so arranged as to be nearly or quite on the line or plane of flotation. Beginning with the simplest form, that of a spiral buoy, as in the figure, the bottom of the body is hollowed out and raised up, and the mooring attached to the upper part of the cone. Such buoys were brought into use by the Trinity Board, in 1854, and perfectly fulfilled the condition proposed.*



* In the River Hooghly, where the stream runs seven knots an hour, these buoys maintained a perfectly upright position, and they are being used to

Proceeding higher in the scale of importance, Mr. Herbert proposes a refuge-beacon on the same construction, which may be moored in those places where a conspicuous sea-mark is imperatively necessary, and where the dangers around it call for some such aid for the ship-wrecked mariner. A beacon of another construction, which proved serviceable in this way on the Goodwin Sands, was designed by Captain Bullock, and another by Mr. Walker. Mr. Herbert's plan is much more advantageous, as it would be placed outside the danger, and only a portion of the risk which would be incurred if it were on the danger would be encountered in reaching it. It consists of a circular base 20 feet in diameter, rising 2 feet 6 inches above the level of the water, on which a column rises to the height of 26 feet, the beacon itself drawing 5 feet of water. Around the deck or platform are stanchions, for the protection of those so unfortunate as to be obliged to resort to it. It is moored from its centre of gravity on the floating line, and must, if brought into general use, be of the greatest service in distant and exposed situations. Such a beacon was moored experimentally in 1854, on the overfall of the South Sand Head of the Goodwin Sands, in a position in which no vessel could have lived. It afterwards sunk from a defect of workmanship. It was carefully watched by the master of the neighbouring light-ship, who states that the tide did not appear to have much effect on it; that the wind could not affect it to cause it to roll; that its motion was greatest in a short breaking sea; and that when he was on it he could not perceive any tugging on its mooring. The sea might have washed over its deck (2 feet 6 inches above the water), but never broke against the tower, a most important fact. It may have rolled about five feet out of the perpendicular, that is about 10 deg.; at the same time the light-vessel herself was washing about from side to side, her mast vibrating more than 26 deg. This vibration at times, and at some stations, is found to exceed 40 deg. from the perpendicular.

But the most important application of this excellent principle, will be in the establishment of floating lighthouses. If the stability and security of mooring a buoy of this construction be established, there can be no difficulty in extending the principle to any magnitude within the capability of engineering skill, which is employed now to overcome difficulties far greater than that of securely mooring a body of the dimensions required for our purpose.

The outline of Mr. Herbert's proposed floating lighthouse as shown in the woodcut,* is intended to show a light at an elevation of 40 feet, giving a range of 11 miles, or it may be raised to any elevation, say 80 feet, having a proportionately large base, which, with the height of the spectator, will give a horizon of 27 miles in diameter. The diameter of the base is 45 feet, and the draught of water 11 feet. The displacement is equal to 325 tons. It will be constructed wholly of

buoy the rapid rivers of Burmah and Siam. All buoys previously used in the Hooghly were carried under water by the force of the stream, their whereabouts being indicated only by a struggling on the surface of the water.

* See *Nautical Magazine*, 1856, page 505.

iron, with all those contrivances now so well understood for ensuring very great strength, durability, and power of resistance. The one great essential that it shall maintain its position, is most carefully provided for. Four chain cables of the largest size and strength will be used, and by laying these in the different directions which experience will show to be those from which the severest strain will come, they will have but little strain in excess of their weight, and whatever that may be, it will only be necessary to compensate for it by diminishing the ballast in the floating base. The action of the waves upon the structure, when moored beyond the reach of the broken water, when the regular swell, however great, passes it, will only be to lift it vertically at regular intervals through a distance proportioned to, but not equal to, their height; thus the strain arising from this source can be readily calculated. It is proposed to use chains three inches in diameter, which it is believed will withstand a strain very many times greater than any to which they can be subjected. These chains pass over a windlass, which, with the central tube or hawse pipe, turns freely as a swivel on the middle of the body, so that the beacon may turn without twisting or fouling its chain. I need not dilate on the many ingenious methods devised for meeting any exigencies; suffice it to say, that all its parts have been successfully studied, and I have no doubt of the ultimate success of the proposition.

The tower will be of sufficient dimensions to carry the finest dioptric or catoptric light, and in all respects it can be established as efficiently as a structure on shore. A comparison of its dimensions can be made with those of the lantern of our present light-vessels. This is given in the woodcut on the same scale. The annual cost of maintenance does not exceed that of shore lighthouses.

With such an addition to our present system of lighting, how many difficulties will disappear, and how many advantages may be immediately placed for the furtherance of the progress and certainty of navigation. I will cite an instance: Lieutenant Fraser, of the Bengal Engineers, has recently visited England to obtain information as to the best mode of proceeding to erect a lighthouse on the Alguada Reef, at the eastern promontory of the Bay of Bengal. This reef is about twelve miles from the shore, and just awash. It is very much in the way of passing vessels. To build a stone or iron lighthouse would be very expensive, but to place a floating lighthouse, which would be equally efficient, would be a simple matter. It could be built here and put together in that country, and towed to its destination. Further, its keepers may be regularly relieved by the passing packet to or from Calcutta or Rangoon. If the lighthouse be on the reef there must be an establishment on the shore, here barren, inhospitable, and unhealthy, and should the weather be unfavourable, landing at the lighthouse would be impossible; in fact, it will be a second Eddystone or Bell Rock, with all their inaccessibility, and this, moreover, in the very unfavourable position of the Bay of Bengal.*

* There are many situations round the coast where the floating beacon

Although I have no more interest in this than what is induced by a favourite subject, I most earnestly trust soon to see this principle of Mr. Herbert's practically added to our resources for navigation. There may be some hope of this, as I see in a parliamentary paper just issued that the government authorities think it expedient and desirable that its practicability and efficiency be tested. I feel quite confident as to the result.

Now, as to its application to our lighthouse system. Mr. Herbert proposes to moor a series of these lighthouses in a direct line up the English Channel, and a similar line up the St. George Channel. The outer light of the former channel will be forty miles South-West of Scilly, on the parallel recommended for vessels to make for the Channel, but from which when now made, they are compelled to run within the reach of danger, in order to verify their position by sighting the lighthouses. From this point a line of these fabrics should be moored at each degree of longitude up to Dungeness, or eight lighthouses in all for the English Channel. Although their horizons will not as proposed, overlap each other, that is, one will be lost sight of before the other is seen, yet they will be sufficiently near to each other for steam-vessels to steer their course by them with the utmost confidence. The same system applies to the St. George Channel, as will be readily understood by the diagrams exhibited.

The outermost of the floating lighthouses would communicate by electric telegraph with the shore, and thus any want or announcement would be made instantaneously in the proper quarters, without the long delays now very frequent. Many other advantages might be placed within the reach of wind-bound vessels by such an establishment.

It is proposed that these lights should be of one exclusive character, differing from the shore lights. Either let them all be fixed, and alter those now fixed to varying lights, but I think it would be preferable, and I now suggest it, that the electric light, with its marked distinction, would be admirably adapted to develop the utility of such a system.

Such a line of lights once established, their utility is made manifest in a very few words. Let it be imperative that all our steam-vessels in going westward pass to the northward of those lights, and those steaming eastward, or up the Channel, to the southward of them, leaving them in each case on the port hand.

These fairway lights would prove an invaluable acquisition to the mariner and the shipping interest at this period, by relieving the commander from that intense anxiety to avoid collision and danger, the chances of which now inevitably accompany his progress up these crowded channels; and we might then hope to see, in a future record

would prove of greater service than the light on shore, as its position could in most cases be chosen according to the necessities of the case, irrespective of many considerations which must now often rule the selection of the site, and of necessity deprive the light of that full benefit it otherwise would afford.—*Naut. Mag*, December, 1857, p. 677.—Capt. Bedford.

of collision and wreck, a far smaller list of calamities than we now see crowded around our lighthouses.

These noble structures in all their utility would still be the safeguard of the coasting-trade, and of all ships not driven by the pressure of the times to sacrifice safety to speed.

With these remarks I close. I have endeavoured concisely to describe the past and present condition of our lighthouses, and to indicate what I believe will be the future direction for their improvement. As the talent and ingenuity of many have raised this beautiful system of applied science to its present high position, so it is open to others to endeavour to supply what may be now required as fresh necessities arise.

Perim Island.

The isle of Perim, called also Bab-el-Mandeb, the occupation of which by the English in February last (1857) occasioned so much observation, is in 12° 38′ N., and 43° 29′ E. Situated at the entrance of the Red Sea, it may in fact be called the key to it, and may be thus described.

The Southern part of the Red Sea narrows more and more towards the strait which separates Asia from Africa, where it is not more than fourteen miles and a half wide. It is in the middle of this strait that the island of Perim is situated, dividing it into two rather narrow passes of unequal breadth, one between Perim and Africa and the other between it and Arabia. The largest is difficult to use although it is nearly ten miles wide, for it is infested with rocks, and it is narrowed by a group of islets called the Eight Brothers. These islets, which are a short distance to the S.W. of Perim, are all about 300 feet above the sea, and are mostly of volcanic origin and of a brown colour. They abound with turtle, and are good fishing stations. Large ships seldom take the great strait, on account of its dangers, although it has a depth of 120 fathoms and a bottom of sand and mud; but they generally take the smaller one, which is much safer.

This passage, which in fact is the only one practicable, is about a mile and a half wide, according to Moresby's excellent chart. To the N.E. of Perim it is narrowed by a rock called the Fisherman Rock, the Pilot Rock, or even the Oyster Rock, which latter there are of an excellent quality. As between the Fisherman Rock and Cape Bab-el-Mandeb of the Arabian coast to the northward the channel is beset with rocks, it cannot be navigated, and it is almost absolutely necessary to pass between Perim and the Fisherman Rock. This channel is scarcely 250 fathoms wide. It has no dangers, and is regular in its depth of 12 to 17 fathoms; off the Fisherman Rock the depth is 11 fathoms, while off Perim it is from 7 to 5 fathoms.

This island is four and a half miles long and two across; the highest part is 230 feet above the sea, from which it slopes to the shores. The bluff end of the island is towards Africa, and the smaller end towards Asia. It has an elliptic form, and to use the words of a voyager who has recently visited it, resembles a huge egg placed across the strait. Its height renders it superior to any effects of the tide, which rises and falls about six feet in those parts.

Perim is barren, rocky, and sterile, and is of the same volcanic rock which extends from the entrance of the Red Sea to Ras Mohammed, the cape of Sinai at the N.W. extremity of the sea nearly 450 leagues from Bab-el-Mandeb. Perim has no water, and even the bushes and briars which are found on the coast of Abyssinia do not appear there. It is not likely that this desolate isle was never inhabited, but it would require some pressing political necessity that could induce anyone to form permanent establishments there, and to live in them.

But besides its important position at the entrance of the Red Sea, that renders Perim so interesting, this island has an excellent and extensive harbour, which would easily contain forty line of battle ships. This harbour, the entrance of which is very narrow, although without danger, is open to the S.W. It is sheltered from nearly every other point; the tide hour is 11½, the tides are not regular but never rise more than 6 feet. With Southerly winds they rise much higher than with those from the North, and it is then somewhat difficult for a ship to leave the harbour. The bottom is mud, and the depth 6 to 7 fathoms, with nothing to guard against. To the Northward of the island there is a sand bank, which seems to have a tendency to increase. Every seaman who has visited Perim is agreed that the port is excellent, and that safe anchorage may be had at two cables' length to the Northward and one to the Southward of it.

Such is nearly the amount of information that we have concerning Isle Perim or Bab-el-Mandeb. At the commencement of this century a chart of the island was made by the English, but this chart has never been published, and we must be content with the general chart of Moresby, and the instructions of Horsburgh.

Cape Bab-el-Mandeb, the S.W. extreme of Arabia, is in lat. 12° 40′ N., and 43° 31′ E., that is 2′ to the North and a little to the East of Perim. It is a projecting promontory, giving its name to the strait, and from the Eastward is seen at the distance of thirty-five or forty miles, or about fifteen leagues. The highest point of it, called Gibel-men-Ali, is not less than 250 yards above the sea. From a distance it looks like the door of a gigantic port, and it is this which gives it the name which it retains.

But one would suppose that this sea appeared to be very forbidding to those who first named it, as they added that this was the port of tears or affliction. In these days, when it is so much frequented, one seeks in vain for the motive which dictated this melancholy name. For eighteen years in which the P. & O. Company's vessels have navigated these waters, carrying passengers to and from India, they

have not met with a single loss; and the more the coasts of the Red Sea are known, the more evident are its natural resources, riches in fact of all kinds which civilization knows well how to turn to account.

Opposite to Babelmandeb, on the other side of the strait, on the Abyssinian or Berberah coast, is a volcanic peak called Gibel-Seajarn, Ras Sejan, which like that of the other mountain of this port, is a means of communication from the Indian Ocean to the Red Sea. The peak of Seajarn is not 380 feet high, and is connected with the continent by a tongue of land 3½ cables wide. The town nearest to this coast is Zeyla, in lat. 11° 17′ N., and long. 43° 5′ E.

It may be well imagined that Perim, as we have described it, is unknown to history, and it would perhaps be difficult to find any precise notice of it among the old authors. Ships pass it without stopping there, and hasten away to the Arabian coast either East or West of it. In fact, Perim has never been heard of but towards the end of the last century, when the English, anticipating some movement in Egypt, took possession of this island at the opposite end of the Red Sea, occupying it until their apprehensions were dissipated. They continued there about two years, constructing some fortifications and a cistern, the remains of which were found in 1834 by Captain Haines, when he was employed by the East India Company with Lieut. Welsted to complete the useful publications of Capt. Moresby. It was about the year 1800 that the abovementioned chart of it was made by the English.

The *Bombay Times* of the 16th of March, 1857, gave the world to understand, that the British flag, in virtue of a treaty made by the resident at Aden with the Sommaulis Chiefs, had been already a month flying at Perim. It appeared that Lieut. Burton and his companions, in 1855, being thrown on the coast in a storm, had been attacked and plundered there by brigands, and that therefore those parts were not sufficiently protected from piracy. In consequence, the English holding Perim, found themselves obliged to protect the commerce of Berberah from pirates. The treaty was concluded in the commencement of the year and on the 14th of February, 1857, the British flag was flying at Perim. A detachment of artillery of the East India Company took possession and constructed batteries there, which were the first fortifications of the arsenal, and supplies of all kinds from Aden were provided.

However, the foregoing details show that Perim might be very easily fortified, and it is not too much to say that it might become hereafter a second Gibraltar if it were desired. There is no situation in the world more favourable, and it may be literally asserted that vessels in going either way through the straits must pass under English guns. How otherwise can it be in a pass of 2,000 yards wide. Some voyagers who have lately visited it on their way to India assert that the English have lost no time and evinced the greatest activity in their operations. We shall soon know what these are.—*Moniteur de la Flotte.*

The Indian Ocean considered with Reference to the Wants of Seamen.

(Continued from p. 254.)

In thick weather vessels uncertain of their position should not steer direct for Pulo-Sapata, or attempt to round the island at night, as it is difficult to distinguish. But as a general rule, they should keep well to the Eastward of it until on the parallel of 10° N. lat., and by standing W.b.S. obtain soundings. Some captains, on leaving the Macclesfield Bank in March, April, or May, run as far as the latitude of Pulo Sapata, keeping well off to the Eastward of the island. In taking this route, however, care must be taken to allow for the S.E. currents, which might set a ship on the banks to the E.N.E. and East of Pulo-Sapata. When the parallel of 10° N. lat. is reached, we should steer between West and South until soundings are found in 28 fathoms; a course should then be steered for Pulo Aor or Pulo Timoan. If bound to the strait of Singapore, when in lat. 7° 6′ N., to avoid the Charlotte Bank, the soundings should not be more than 23 or 25 fathoms.

In March and April vessels returning to Europe should keep well to the Eastward, to pass between the Natunas and Anambas Islands, and take the strait of Gaspar.

Home Route from China to the Gulf of Bengal in the S.W. Monsoon.—It has long been considered impossible to cross the China Sea from North to South against the S.W. monsoon. With a good ship, however, this may be done in any season by adopting the inner route West of the Paracels. By leaving the Great Ladrone, with one of those breezes from East and S.E., which are very frequent there, and last for several days, a vessel would probably reach the strait of Singapore if bound to Bengal sooner than by taking the Eastern routes by the coast of Luconia, to which we shall allude presently. In this case she should pass at a moderate distance from Hainan and the coast of Cochin China, but not near enough to feel the effect of the strong N.N.E. currents of that coast, nor so far out to sea as to lose the advantage of the changes of wind and smooth sea. Besides which, out at sea the wind is frequently South and S.S.W.

The route we have just pointed out applies only to ships bound to the gulf of Bengal by the strait of Malacca; but in some years it is attended with much difficulty. Vessels for the West coast of India, or the Cape of Good Hope, should not adopt it, if they meet with contrary winds at the entrance of the strait of Malacca, because they will find great difficulty in getting through, and the winds will continue contrary for a space of 12° or 14° of latitude; after having passed Cape Acheen, that is, up to the equatorial limit of the trade winds. In May and June a vessel should not make to the Southward for the straits of Gaspar, Banca, or Carimata.

A ship leaving Canton with the S.W. monsoon for Europe, or the Eastern coast of India, would find it prudent to follow one of the

routes we shall now give; she should take either one or the other, according to the season at which she leaves China, while the S.W. monsoon prevails.

First Eastern Route. Return from China to the West Coast of India and Europe.—A ship leaving Macao, or the Great Ladrone, in the end of April or beginning of May for the first Eastern route, that is, the Mindoro Strait, should make to the South as far as the Macclesfield Bank, if the wind permit, so as to reach the N.W. extreme of Mindoro without tacking in case of the wind shifting to S.W. From near the Macclesfield Bank she would stand S.E, keeping her wind if it is all to the S.W., and should it not admit of her weathering the point of Calavite she should work along the coast of Luconia with the variable winds, with which she will reach the N.W. extremity of Mindoro.

The channel East of the bank of Apo should be adopted for crossing the Mindoro Strait, giving the Mindoro coast a berth of some miles, if the wind is variable; a distance of nine or ten miles is necessary if the S.W. wind is steady; she will then pass the islands of Ambolon and Ilin at a distance of about fifteen miles.

Should the wind admit, a vessel may cross the strait of Mindoro, passing West of the Apo bank, in the Northumberland Channel, formed by this bank and the Calamianes. She would then keep along the coast of Panay, working, if necessary, at some distance from this island. according to circumstances, and would near the island of Quinilaban, so as to pass the dry sand bank between this island and the coast of Panay.

Having reached Cape Naso, she would then stand for the strait of Basilan, making it well to the Southward and Westward, when the wind is from these quarters; but steering direct for it if the wind is Easterly. The S.W. extreme of Mindanao being gained, it will be better to take the strait of Basilan than those formed by the islands to the S.W., the former route being the shortest; the Celebes Sea will thus be entered, and the ship will make for the strait of Macassar. Instead of persevering in working at the entrance of the strait of Basilan against S.E. winds, Capt. Spratly recommends steering West, in order to pass West of the archipelago of the Sooloo Islands, between the point of Nusang and the island of Tawee-Tawee. There are two little islands close off the S.W. point of this island, bearing S.W., near the island of Sibbootoo, and forming a good channel leading direct to the Celebes Sea. This channel is safe, and Capt. Spratly says, it is easy of navigation both by night and day. He considers four hours sufficient for passing from one sea to the other by it, while under similar circumstances it has sometimes occupied four days in going from one sea to the other by the strait of Basilan.

To leave the Celebes Sea, a vessel may either take the Macassar Strait or the Molucca Channel. Some navigators prefer the latter when the S.E. monsoon prevails North of the equator. In fact, it is difficult, without a tedious working to windward, to reach Allas Strait from the strait of Macassar; while by taking the Molucca

Channel the S.E. monsoon is found in a latitude sufficiently to the Eastward to enable one to take whichever Eastern Channel is preferred. But vessels bound to Batavia, or the strait of Sunda, will find it best to take the strait of Macassar.

On leaving the strait of Basilan, if the Easterly wind is well established, a vessel should steer so as to make Cape Donda to the S.S.E. or South; but most generally, from the winds veering Westward near the Northern entrance of the strait, and the current setting Eastward, it is prudent to keep as much as possible to the Westward, ni order to sight Point Kanneeunegan. According to Capt. Spratly, a ship off Cape Rivers is sometimes set to the Eastward by the current along the coast of Celebes, and after useless contest with it, is sometimes obliged to take the Molucca Channel.

A ship having entered the strait of Macassar, should keep along the West coast of Celebes, passing East of the Little Paternosters, being very cautious, on account of the dangers North of the islands of Nossa Seras, in passing between them and the Great Pulo Laut. From thence she should steer for the strait of Allas, or one of the straits leading into the Indian Ocean. If bound to Batavia or the strait of Sunda from the strait of Macassar, she should steer South if the wind will permit, and pass North of the Little Paternosters for the coast of Borneo, keeping along this coast and providing against the dangers off it, as well inshore as to seaward. She would then enter the Java Sea, and reach Batavia or the strait of Sunda without difficulty; and thence the Indian Ocean, and make for the Cape by route No. 12; or the Western coast of India, by the routes described in the third division of this chapter.

A ship taking this route, and meeting with contrary winds from the strait of Basilan, so as to be unable to reach the strait of Macassar, may take the Molucca Channel, and should then steer for the islands near the N.E. end of Celebes; and passing between the islands of Banka and Bejaren, would round the N.E. point of that island, and then steer to the Southward, through the channel formed by Lissa-Matula and Oby-Major, which is the most frequented: or, if the wind should not permit her reaching it, should take the Greyhound Channel, between the islands of Albion and Hammond (West of Xulla-Talyabo).

When it is difficult to get to the Southward in the Molucca Channel, dull sailing vessels might try to do so by keeping near the West coast of Gilolo; thence they might enter the strait of Patientia, between Gilolo and Batchian, or the strait of Batchian, formed by the island of this name and Tawally and Maregoland.

However, a ship having reached the Northern extremity of Gilolo or Morty in the height of the S.W. monsoon, should rather pass through the Gilolo Channel than that of the Moluccas, because it leads more directly to Pitt Channel, by which she may gain the Eastern straits.

On leaving the Molucca Channel the strait of Ombay may be adopted if desirable. A ship should then pass close to Oby-Major, in

order easily to round the East coast of Bouron, and to pass between this island and that of Manipa. She would then run to the Southward into the Banda Sea, where the winds are generally from E.S.E.; on leaving Manipa she would endeavour to pass to the East of Ombay, and having crossed the channel formed by this island and Wetta, would follow the West coast of Timor, and enter the Indian Ocean between Semao and Savu. This is the shortest route during this season, from Pitt Passage to the Indian Ocean.

Second Eastern Route.—The second Eastern route for Europe or the West coast of India from China, with the S.W. monsoon, is adopted from the middle of May to the end of July. This route is by taking the Pacific Ocean East of the Philippines, and passing through Pitt Channel. In August it is too late to adopt this route, and a ship obliged to leave Macao then, should follow the coasts of Cochin China and Cambodia, unless from being a bad sailer it may be better to defer her departure until September.

With Southerly or S.W. winds, a ship to pass East of the Philippines should leave Macao by the Lema Channel, and then steer South in order to enter the Pacific Ocean without tacking. If the wind admits, the channel between the Bashee and Babuyanes Islands should be adopted. Having reached the Pacific Ocean, S.W. winds at this season will generally be found, with Easterly or N.E. currents; she would then steer S.E. in order to avoid Cape Engano and Luconia, tacking if necessary so as to pass neither too far out nor too close, and taking care not to round the Pelew Islands further to the Eastward than is necessary.

The best route for making Southing is then East of the isles of St. Andrew, Current, Marriere, Lord North, and the dangerous Helena Shoal. If Easterly currents are met they will not be strong as far as the Pelew Islands; but between lat. 5° and 2° N. they set at the rate of thirty to sixty miles per day. This part must therefore be crossed as quickly as possible if the wind is West, as it frequently is; and if the wind is light, a ship may be set far to the Eastward by this current. But from the lat. of 2° N. to the equator, a Westerly current will be found, while near Dampier Strait it is again running to the Eastward.

Having rounded to the Eastward the island of St. Andrew, a ship should endeavour to keep between the meridians of 132° and 133° E. long., and when in 1° N. lat. if Dampier Strait is to be taken, she should make for Point Pigot.

The strait of Gilolo being larger than that of Dampier, is often preferred for that reason, and it has few difficulties to overcome in reaching Pitt Passage.

When Gilolo strait is to be adopted, on leaving the parallel of 2° N. a ship should steer for the isles of Asia, and round them on the North if the wind permits, unless she passes between these islands and Ayon.

Having passed the islands of Eye and Syang, she would then go North or South of the island of Geby, and if the weather be not favourable, instead of the strait of Bougainville she might take that of

Gilolo, which is North of it; and in crossing this strait she should keep near the Eastern coast, and enter Pitt Channel between Pulo-Pisang and the Boo Isles, or else, according to circumstances, between Kekek and Pulo-Gass.

A vessel entering Dampier Strait should round Point Pigot at a distance of six to twelve miles, and then steer for King William Island, keeping it West of her; when about nine miles from it, she should steer for Pigeon Island, and pass two or three miles South of it; she may then cross the strait, taking care to avoid any dangers in her way.

On leaving Dampier Strait she would go close round Cape Mabo, so as if possible to pass South of Pulo-Popo; or she may pass North of this island and enter Pitt Channel between the Boo Islands and Pulo-Popa. In Pitt Channel she should keep mid-channel, borrowing rather on the Southern than on the Northern side. Having reached West of Pulo-Popa, and cleared Pitt Passage, passing between Ceram and Bouron, the Indian Ocean may be entered by the strait of Ombay or one of those Westward of it.

The strait of Ombay is the most direct route to the Indian Ocean during the S.E. monsoon; a vessel would then follow route No. 12, if bound to Europe; or those given in the third division if going to the Western coast of India. If intending to take the straits of Salayer, or those of Allas or Sapie, the N.W. part of Bouron should be gained, and thence the most Northerly of the Toukan Bessy Group should be rounded at two or three miles distance; and from thence enter the strait of Salayer.

Route for the Gulf of Bengal in the S.E. Monsoon.—On leaving this last strait for Bengal during the S.E. monsoon, a ship should pass near the large Solombo, leaving the Brill Bank either to the South or North, and from this island should pass round the banks situated off Pulo-Mancap, and cross the Carimata Passage, then steering for the North extremity of Banca, and take the strait of Dryon or Singapore, to enter Malacca Strait. It is likely that by this route she would speedily reach the Gulf of Bengal.

The straits of Sapie and Allas are generally taken by ships bound to Europe or the West coast of India. To enter Sapie Strait after rounding the Salayer Isles to the South, the North part of Comodo should be made, and then the West channel between Gilibanta and Goonong Apee.

If Allas Strait be adopted, Plate Island should be sighted, from which island a course may be steered for the entrance of the strait, the vessel keeping the chain of low islands, N.W. of Sumbawa, at a respectful distance; after which, she may cross the strait. She may then follow route No. 12, if bound to the Cape of Good Hope, or those given in the third division if bound to the West coast of India.

Such are the routes the most frequented in all seasons both in going to China or returning. It now remains to speak more particularly of the navigation of the China Sea.

Navigation of the China Sea during the Monsoons.—The passage

to the Northward or Southward against either of the monsoons, is continually made by clippers, vessels which carry opium to China. The following observations are borrowed from Commander P. J. Blake, of the English ship *Larne*. To his own private remarks this officer has added those which have been communicated to him by captains of clippers well acquainted with this navigation.

As a general rule, vessels working up against the monsoon, when it is at its height, or when it is favourable, whether they are going North or South in the China Sea, should, if near them, pass to leeward of the Paracel Islands and the shoals off them, and also to leeward of the shoals of Pratas and Scarborough.

This precaution is extremely necessary on account of the currents which constantly and invariably set towards these shoals.

There is, however, one exception to this rule, and it is when working to the Northward against the N.E. monsoon, and approaching the parallel of 14° N. lat. In that part there is a large space of open sea, and a vessel should make along to the Eastward as far as the coast of Luconia, so as to lay up for Macao, and reach it on the other tack.

In crossing the China Sea with the N.E. monsoon for Macao or the straits of Singapore, Banca, or Gaspar, the direct course is that most generally adopted. The Paracels are generally left to the Eastward, at no great distance, and in general a Southerly current is found near them, running from thirty to fifty miles in twenty-four hours. Between the parallels of 14° and 11° currents have been found running sixty miles per day. After passing the Paracels, the coast of China may be gradually approached in the latitude of Cape Varela or the Pagoda. From thence the course should lead thirty or forty miles East of Pulo-Sapata, and from this island to Singapore the route is direct, being West forty miles to the Anambas, always making Pulo-Aor if possible, and to verify the position of the vessel soundings should be frequently obtained. From Pulo-Aor one of the straits abovementioned may be easily reached.

The route generally taken from Pulo-Aor to the straits East of Java, during the height of the monsoon, is as follows. A vessel being about five leagues East of Pulo-Aor, should steer so as to sight Victory Island, from whence, steering West, she would make St. Julien, St. Esprit, and St. Barbe, at a good distance. On leaving this latter she should steer for Sourouton and Carimata, if this channel is to be adopted, which at this season is the surest route for reaching the Eastern straits. From Sourouton a course should steer for Pulo-Mancap, the Java Sea then entered, keeping a good distance to the West and South of the dangers off this island. The Carimon Java should then be steered for, and then the North coast of Java approached, running Eastward along this coast and that of Madura. Isle Pondy would then be passed on the East, from thence, avoiding the Minders Rocks, a course should be shaped for Cape Sedano, at the North entrance of Bally Strait, and the strait entered by passing either East or West of Gilboan.

Some seamen prefer Lombock to Bally Strait, which is farther to the Eastward and is larger.

A ship leaving the China Sea for the strait of Gaspar, will generally pass the West channel, that of the Macclesfield. In this case, from Pulo-Aor she would steer for Pulo-Loty, passing fifteen or eighteen miles East of it if the wind veers at all to the N.E. From Pulo-Loty she would make for Gaspar Island, passing on either side of it, and at the distance of about two miles round the West coast of Pulo-Leat, and leaving the Vansittart Shoal and the rock of Dordelen to the Eastward, in the Southern part of this strait, and then enter the Java Sea for the Eastern strait as before stated.

The preceding instructions apply chiefly to vessels leaving China at the beginning of the N.E. monsoon, the strait of Banca being adopted in preference to the preceding ones. In this case, Pulo-Taya should be made and passed to the West, making afterwards for the point of Batacaran, and the peak of Monopin of Banca, at the Northern entrance of that strait.

At the end of the N.E. monsoon it will be better instead of sighting Pulo Aor to make the North Natunas, because at this season S.S.W. winds are found, varying to S.E. and East. If, therefore, a vessel desires to reach the Strait of Gaspar from the North Natunas she should pass fifteen or sixteen miles West of the Great Natuna and West of the Haycock; then round the Victory and Barren Islands on the East, and on the West those of Camel, St. Julian, and St. Esprit, if the wind permits; or, if not, whichever channel between these islands that will suit best. From the St. Esprit Group she would steer for St. Barbe, and pass about nine miles West of it; then for Gaspar Island, passing one or two miles East of that island; then along the West coast of Pulo Leat and enter the Java Sea through the Macclesfield Channel.

If at this period contrary winds are apprehended, a vessel before entering the Strait of Gaspar may make the N.W. point of Billiton, round the islands off this point at a good distance, then steer West of the coast of Long Island, and thence, avoiding the dangers of the Clement Channel, would leave this channel between South and Selle Islands; she would afterwards pass East of the Vansittart Bank and the Dordelin Rock, and thence into the Java Sea.

At this season, on leaving Banca Strait, or that of Carimata, the Strait of Sunda is the most direct route for the Indian Ocean.

In running to the China Sea from South to North with the S.W. monsoon, the outer passage should be preferred, East of Paracels, where the sea is free from dangers. During this monsoon the wind draws southward, varying from S.S.W. to S.S.E. during the height of the monsoon (June and July).

Although some *Directions* (amongst others those of Horsburgh) recommend the channel West of the Paracels and the coast of Cochin China, I think, says Commander Blake, that we should avoid it. He adds that in this route a narrow channel must be crossed, and in some

cases the risk is incurred of being carried by the current to the N.W. of the Paracels. Several vessels have been lost on the shoals in these parts, owing to the N.W. winds from Tonkin Gulf and the northerly currents. In the S.W. monsoon, a vessel taking the channel between Hainan and Paracels, if the weather is cloudy, will find it very difficult, with currents varying in force and direction, to keep her course with sufficient precision to make a safe passage through it.

Horsburg advises the inner route to be taken in case the vessel is disabled or has sprung a leak, because she can keep the land in sight.

On leaving Pulo Aor she would steer for the Redang Isles, then cross the Gulf of Siam, passing Pulo Obi, and follow the coast of Cambodia or Cochin-China, only leaving the latter near Tourane. From thence she will soon reach Hainan, and, running along the coast, leave the Taya Isles to the eastward, and then shape a course for the coast of China near Hai-Ling-Shan; from whence she would proceed along the coast to Macao. In this route a disabled vessel will find a smooth sea and pass many harbours, where, if necessary, she can take refuge. This passage would doubtless be tedious, especially about the middle of March or beginning of April.

(To be continued.)

THE DANUBE.

The Danube, it is well known, falls into the Black Sea by four different mouths, which are the Kilia to the North, and successively the Sulina, the St. George, and the Portitsa. They are only separated from each other by very low islands, often inundated, and the borders of which on the sea side are fringed with banks of three or four miles extent.

The Danube was called the Ister by the ancients. Strabo, who wrote three-fourths of a century before our Saviour, gave it six mouths, and Ephorus, whose time was 250 years before Strabo, gave it five. The southern one, after forming the island of Penee, entered the sea above Cape Piorum. Ptolomy called it the Sacrum Ostium or sacred mouth. The same author, who flourished in the twelfth century of our era, named the second branch Inariatium; the third, Pulchrum Ostium, the fair mouth; the fourth, Pseudostomos, deceitful mouth; the sixth, Boreum Ostium; and the seventh, Thiagola. The name of the fifth we do not know. The finest isle of the Danube, called Penee in the days of antiquity, was covered with magnificent pines.

The mouths of the river from that distant period have been diminishing in number, and it may be safely said they will continue to do

so. The alluvium deposited daily becomes greater, and at no very distant day one or two of the late outlets of this great river will become choked up. This result might be hastened by directing the great body of the river through a single mouth, which would become deeper and more available in every respect for navigation.

Most of the vessels that enter the Black Sea adopt the Sulina branch because, in spite of its bar it still has the fewest obstacles. At one time of the year it has a depth of nine to ten feet; in autumn, and especially at the commencement of the spring, it has twelve and sometimes fourteen feet. Unfortunately, the channel available for large ships is narrow, and when one of them is lost in it the passage is reduced for a long time, and sometimes even obstructed. By the last accounts from Sulina, of the 30th April, this inconvenience had actually occurred then by the wreck of the *Ercolano*, in consequence of the bad weather which had prevailed for two months in the Black Sea.

As soon as the bar is cleared the depth increases, and as much as seventy-eight feet will be found as far Isacha and Reni. In proceeding up this branch of the Danube the Turkish village of Toultcha is passed on the right bank of the river; from thence, proceeding Northward, the point of Tchatal Island is passed and Ismail is reached, a formidable town ceded by Russia according to the treaty of Paris, and which now belongs to Moldavia.

Thirty-five miles West of Ismail is the little town of Reni, a little below the confluence of the Pruth with the Danube, which, like Ismail, exports corn, maize, rye, and wool. Continuing upwards, Galatz appears, which, with Ibraila, is the most important port on the Danube belonging to Wallachia. Galatz is situated between the mouths of the Pruth and the Sereth, and ten miles above Reni. A great number of vessels arrive at this port and, independently of the above mentioned produce, take in spars for masts, wax, hides, and wines for Odessa. Such are the positions which give so much importance to the Sulina branch.

The Kilia branch, which is very deep, is obstructed by so great a number of islets and banks as to have been abandoned by shipping. The St. George entrance is equally beset with banks, and has in the middle of it an islet covered with bushes, in the midst of which are some fishermen's huts. This mouth is difficult of access and often dangerous. The Portitza mouth forms the liman of Bazalme and is quite impracticable.

Such is the actual condition of the mouths of the Danube at present. Every day that condition deteriorates and the whole subject has most important claims on the serious attention of the Conference at Paris. The fire at Sulina destroyed three houses and but for the assistance of the French steamer *Auverne* the whole of Sulina would have been destroyed. The ships of war in the Danube at present are the French steamer *Auverne* and the *Meurtriere*, the two English steamers *Weser* and *Boxer*, the Austrian steamer *Taurus*

and *Croatia* transport. The Sardinian steamer *Anthione*, of 180 h.p., left the Danube on the 3rd May for Constantinople to attend the Sardinian Minister.

The breaking up of the ice in the Danube had commenced on the 13th March, and there was reason to believe that it would not occasion any accident to shipping off Galatz. Since the beginning of the month the temperature had changed considerably, and the thickness of the ice had been much reduced by fifteen days of thaw. The breaking up, therefore, had not been occasioned by a sudden rising of the water, but by the current only, which had drifted away masses of ice after reducing their thickness and weight.

The position occupied by the shipping is well protected by a projecting point; while the current of the river is carrying the ice down at two or three knots the ships remain perfectly secure, protected by the mass of ice in which they are frozen. After a winter which has been unusually severe, in which the Danube has been more severely frozen than for many years, a very dangerous thaw was predicted. But from the manner in which the ice is passing away apprehensions are removed, for it is under most favourable circumstances, without any rising of the water, after so long a thaw, in which the ice has lost its consistence.

The removal of the ice will last for some time, and it is not probable that navigation will be resumed before the end of March. The French steamer *Auverne* is to proceed to Sulina as soon as possible, the spring being an active period in the commerce of the Danube. The vessels which have wintered in the river are off with their cargoes, and others are arriving for the grain that remains from last year's crop. The captain of the port and the chief pilot at Sulina have been changed, and it is believed that the police of the port will be excellent.

In consequence of the dryness of weather that has prevailed there, as well as in Europe generally, the water of the Danube is very low, and does not increase with the rains of spring or the melting of snow, which has not fallen in any quantity this year, and will not admit of the water rising above its accustomed level.

It is stated that some merchants of Ibraila and Galatz are about to form a company for passenger and steam-tug traffic between Orsova and Galatz.

LIGHTNING IN THE PACIFIC: *Efficacy of Harris's Conductors.*

It appears by reports from H.M.S. *Havannah*, dated 31st December, 1857, that the U.S. flag-ship *Independence*, the U.S. corvette

John Adams, and the *Havannah*, lying close to each other at Panama, experienced a furious storm of lightning and thunder, during which the electrical discharge struck the *Independence* and shivered her main-mast. The *John Adams* also was struck, and a small conducting chain of the old kind melted. The *Havannah*, fitted with Harris's conductors, did not experience any ill effects whatever.

The following is an extract from the log of the *Havannah* relative to the damage sustained by the U.S. flag-ship *Independence*.

"*Sunday 5th July*, 1857.—Wind East. Weather squally, with thunder and lightning. 10h. a.m.—Main-mast of U.S. ship *Independence* struck by lightning, destroying chain conductor, topgallant-mast, royal-yard, and injuring lower mast."

On the North American station, H.M.S. *Brunswick* reports that very heavy lightning storms were experienced both at Colon and Carthagena, attended by much rain. The clouds burst immediately over the ship, but no damage ensued. The date of report is the 31st December, 1857.

NAUTICAL NOTICES.

PARTICULARS OF LIGHTS RECENTLY ESTABLISHED.

(Continued from p. 271.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
26. Breaksea Isl., King Geo. S.	Australia	35° 4·3′ S., 118° 3·3′ E.	F.	384	25	Est. 1st Jan. Visible bearing between W.b.S. and N.E.¼N.
26. Princ. Royal Harbour	Ditto	Harb. Light	F.	37	10	Est. 1st Jan. On Point King. Var. 5¾° W.
27. Cape Schank	Ditto					Intended. Also on Wilson Promontory.
28. Turkish Lts.	Dardan. and	Bosphorus				See April number page 209.
29. Surinam	Position of	vessel altered				Bram Point S.S.E.½E. 9′.
30. Buoys of the	Tay. Buoys	altered				Red to starboard, black to port.
31. Eddystone	Painted red	and white in				horizontal bands.
32. Cape Busto	Spain	43° 36·2′ N., 6° 28·8′ E.	Ffl.	311	12	Est. 1st April. Interval of flashes 2 minutes.
33. Cape Salou	Ditto	41° 3·8′ N., 1° 9·6′ E.	Ffl.	141	15	Est. 1st April.
34. Roanoke Marshes, on Jackson Isl.	United States		F.	34	10	Est. 15th April. On East side of channel.
35. Needles Rks.	Isle Wight		F.	80		Est. 1st Jan., '59. Appears *red* when seen bearing from N.W.½N. (westward) to S.W.b.W.½W., except between E.½S. and S.E.b.E.½E.
36. Dungarvan B. Ballinacourty Pt.	Ireland	52° 4·4′ N., 7° 33·1′ W.	F.	52	10	Est. 1st July, '58. Visible when bearing from West to S.E.½S. Appears green between West and N.W.b.W., and red from Carrickapane Rock.
37. Swinemunde, Eastern side	Prussia	53° 55′ N., 14° 17·6′ E.	F.	211	21	Est. Visible when bearing from W.b.N. round Westward to N.b.E.

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

Sylvester Shoal, *off Carbonera, Mediterranean.*

The following letter, from the *Shipping Gazette*, reports a danger which has not yet found its way into the chart.

Queenstown, March 26th, 1858.

Sir,—On my late passage from Constantinople to this place, while standing southward, with a light breeze from W.S.W., I ran directly over a small shoal of not over four fathoms. The shells, pebbles, and clay, of which it seemed to be composed, were very plainly to be seen. We were right on it before we saw it, and were off it before we had time to sound, although going very slow at the time, giving us a short but good opportunity to see it plainly. The tower on Point Mesa (Point Mesa lies about twelve miles N.E. of Cape de Gatte) bore W.b.N. two miles distant, and Carbonera village N.W.b.N. three or three and a half miles. The shoal was small to appearance, not much over 100 feet in circumference, white on top, and dark around it, as though covered with seaweed. The marks I took for it were the dark point (southern) of Point Mesa in one with a bold white cliff on the western shore beyond. I mention the dark point because there was a reddish-brown point in a line with the dark point, which we opened out as we stood southward, and the castle at Carbonera in one with the northern slope of a small hill just back of the village. If you think this worthy of notice you will please give it a place in your valuable paper, and oblige,

J. W. Sylvester,
of the American barque John Wesley.

To the Editor of the Shipping Gazette.

Bass Strait,—*Dangers of Curtis Island, Clarendon Rock.*

It has long been the peculiar privilege of the *Nautical Magazine* to serve as a receptacle for the fugitive pieces of hydrography of the day, and thus to rescue them from oblivion, and not only to apply them to the chart for the mariner, but to preserve them to him for reference on a future day, when he is passing by the dangers on which they treat, in the calm or in the gale, by night or by day. That our services in this respect have long since been acknowledged, we have frequently had the satisfaction of recording, and we have now another instance to add to them,—to show up ar other rock that has all but been fatal to ships. We find the following in *Mitchell's Maritime Register* of the 24th of March last.

"The brig *Clarendon*, from Newcastle, (N.S.W.,) deeply laden with coals, arrived yesterday after a most lengthy passage, having, in consequence of accidentally running on a sunken rock, been compelled to bear up for the promontory. The following is from the log:—

'December 2nd, at 9.30 a.m., then under double-reefed topsails and courses, a very heavy sea running, the wind blowing from the S.W., the port tacks on board, struck a sunken rock with great violence, causing the vessel to heel over very considerably, striking heavily twice. There was no lead-line on deck to ascertain sounding, but distinctly sighted the rock, and mud thickly stirred up by the collision. It was half-tide; the depth of water on the rock was, as near as could be judged, 10 feet. The appearance of the rock was round, 40 or 50 feet in circumference, Curtis Island (the highest part) bearing by compass W.b.S., the Inner Sugarloaf Island bearing, S.W.b.S. three miles. Immediately after the accident the pump-well was sounded, and found the ship making water. The weather still getting more boisterous, deemed it expedient to bear up for the promontory, anchoring in Sealers Cove, intending to lighten the ship to ascertain the leak; but finding that one pump could keep the water under, again weighed anchor on the 5th December.'—*S.A. Register.*"

That such a danger as is here reported was likely to be found some day, appears evident from the remarks in the *Australian Directory* on Curtis Island, although this appears to be considerably to the Eastward of those reported in a foot note as seen by the master of the *Pyramus*, but which are considered by the late Capt. King* to "want confirmation." But as no other dangers have been known to exist about Curtis Island excepting those which appear in the chart, vessels will have to be cautious in future how they approach this "finger-post for ships passing through the strait" on its Eastern side, especially when desirous of making the most they can against a S.W. breeze in the smooth water under their lee, like the unfortunate brig *Clarendon*, which has been the unintentional means of discovering this new danger.

ATLANTIC DANGERS.—Under this title may be collected a great mass of evidence showing the necessity for deep soundings either to substantiate or to sweep away these oft repeated reports. Indeed the whole bed of the Atlantic offers some highly interesting places for deep sounding, and few more so than that of the bank on which the Azores stand, especially the N.E. side of it, where so many of these dangers are stated to show themselves, among which the following is an old one.

Greenock, May 24th.—Capt. Cowans, of the barque *Cherokee*, which arrived here from Trinidad on Friday, has sent the following notice respecting the "Three Chimneys:"—April 20th, lat. 47° 50′ N., long.

* Although not stated in the "Directory," we must presume it to be that "pyramidal rock" (of which there are two) nearest to Curtis Island. It is a mile and a half from it, and 350 feet high, while the sugar-loaf (outer one) one mile and a half to the Southward of it, is 316 feet high.—*Australia Directory*, vol. i., p. 140.

28° 40′ W. I have now crossed this position on the chart, or very near to it, four separate voyages, without having seen the "Three Chimneys" as laid down on a chart published by James Imray in 1852; but have remarked at this particular position large flocks of birds every time. I may also add, that it was always in daylight I happened to be near this place. May there not be a shoal hereabouts, which may render caution necessary in approaching it.—*Shipping and Mercantile Gazette.*

Here is another of the same kind:—Swansea, May 5th.—To the Editor of *Mitchell's Maritime Register*,—Sir,—On my passage here from Caldera, I passed, April 20th, 1858, in lat. 44° 56′, long. 23° 51′, a reef of rock just covered with water, the position of which is not laid down in the charts. Owing to the strong breeze blowing at the time I was unable to make further observation. The reef is most dangerously situated in the direct course of vessels from the Western Islands to the Channel. Trusting you will insert this in your valuable paper,—I am, &c.,—T. H. CHADERTON, Master of the barque *Salween*, of Liverpool.

THE MACDONALD ISLANDS.—An account has lately appeared in the daily papers of new islands in the *Atlantic Ocean*, that on investigation have turned out to be no other than the Macdonald Islands, to the S.E. of Kerguelen Island, in the Southern part of the Indian Ocean, an account of the discovery of which was given long ago in the *Nautical*. This rediscovery, and wrong naming of the ocean may be admissible enough in daily prints not informed on such matters, but we have been somewhat surprised on learning that they have been just received as a new discovery by the Geographical Society of Berlin.

PERIM ISLAND: *Reported Danger S.W. of the Island.*—Captain Brown, of the *Candia* (s.), writes, under date from the Red Sea, 10th January, and says,—"In running through the Straits of Bab-el-Mandeb, the Peak being at E.N.E., half a mile off Perim Island the ship struck something very slightly for about six seconds, but did not stop; whether a shoal or sunken wreck not known." Much caution will be required here, as there can be little doubt, from the nature of the ground hereabouts, that the *Candia* must have grazed a rock.

RODRIGUEZ ISLAND, *Indian Ocean.*—A schooner called the *James Gibson*, by a report in the *Shipping and Mercantile Gazette*, appears to have been lost on the reefs off the S.E. part of this island on the 20th January last, at the distance, as stated by her captain, "where she now lies on the reef off the S.E. coast of the island, in the opinion of most people of the island, as well as that of Captain Daviot and myself, over twelve and under fifteen miles from the land." Thus seamen are told to conclude by this report; but, after making every

allowance for possible incorrect reporting and misprinting, as such things will occur, as they evidently have in this case, we may be allowed to repeat to them what no doubt they very well know already, that nothing of the kind exists at the above distance. This distance, however, may be stated also, but it is a curious coincidence that by the protests of the *Queen Victoria* and the *Oxford*, both of which vessels were lost there in 1843, the same distance was given, but found by Sir John Marshall, in command of H.M.S. *Isis*, to dwindle down to five or six miles.* The *James Gibson* seems to have got into the equatorial current alluded to in page 322 of our June number of last year.

DIDICAS ROCKS: *North End of Lucon.*—Capt. Jennings, master of the ship *Contest*, just arrived at Cork from Manila, reports as follows:—What are marked as Didicas Rocks in Horsburgh's chart, North end of Lucon, I passed within half a mile on the 25th of August last, and was surprised to see within fifty yards of them an island above one mile in circumference and about 200 feet high, on the North side of which, and about twenty feet above water, is a large crater of a volcano, out of which smoke, fire, and lava, were pouring most furiously. I reported it at Manila, but the Spaniards know nothing about it. The foregoing, from the *Shipping Gazette*, is important to seamen. The *Contest*, however, must have been nearer to this danger than she ought to have been. By the chart of the Bashee and Ballintang Channels they consist of several small islands occupying a space of three miles in a N.E. and S.W. direction. Horsburgh calls them "four sharp-pointed rocks," dangerous in light winds from the currents, which produce ripplings and breakers,—and no anchorage in case of necessity. They should therefore have a wide berth.

BARBADOS.—A buoy (red with a staff and ball) has been placed on the shoal off Needham Point, in 5 fathoms at low water, with the following marks and bearings by compass:—Garrison Clock on with the North angle of Beckwith Fort, E. ½ N.; a remarkable house (known as Margate House on Brown's Bluff) on the crest of land at Worthing, just open of the South angle of Fort Charles, E. ¾ S.; Highgate Flagstaff in a line with the end of a drain on the beach South of the Engineer's Wharf, E.N.E.; the outer house on Pelican Point, N.N.W.

THE RED SEA ELECTRIC CABLE.

A recent mail has brought home the report of Capt. Pullen on laying the electric cable in the Red Sea, a project which was condemned by party spirit

* *Nautical Magazine*, June, 1844, pp. 260—2.

as impossible. The bugbears were the enormous depth and the *sharp pointed rocks!* got up by some officious friend of the Euphrates line to paralyse the efforts of the Red Sea Company: nor was opposition to it wanting from another quarter from whence it should have received encouragement, to all of which we alluded in our last year's volume. The report of Capt. Pullen, in the *Cyclops*, has dissipated all this idle report, and the want of space only obliges us to defer it for our next number. But the concluding paragraph so fully confirms the opinion we gave, that we must make room for it, and may also observe in reference to Jidda that the reefs of that place may be avoided by bringing the cable to the shore to the northward of the town, where there is deep water close to it, and so deep as to render it impossible for any vessels to anchor there, a condition exactly adapted for the cable. Every one knows that where the will is there the way is, but there are those who take the wrong way from choice! and to them Capt. Pullen's opinion may be instructive.

"In conclusion I beg to observe that I think no place better adapted for laying a telegraphic cable than the Red Sea; there certainly is the choice of routes, and throughout on either shore a soft bed may be got; the water is deep, though not more so, or even as much, as where other cables have been laid, except, perhaps, in the middle; and all we know of that yet is certainly of a nature to cause no injury. In the vacant spots within the entrance, &c., I should hardly imagine that very great depth would be found."

THE ANDAMAN ISLANDS.—The settlement on the Andaman Islands, to which it is stated the Ex-king of Delhi is to be sent, and some account of which appeared in our April number, has been formed, but the details have not yet been carried out. Dr. Walker, some time governor of the Agra gaol, has been appointed superintendent of the Sepoy depot at Fort Blair. The salary of Dr. Walker has, we believe, been fixed at 1,000 rupees a month; not a large sum if he carry out with ability his arduous duties. He has power of life and death within the precincts of his small domain, but it does not appear likely that he will abuse even such ample powers.

The treatment of the natives is a somewhat delicate point. At present they seem determined upon aggression, and all efforts at conciliation are vain. If a man wander a little way from his party without arms, he is sure to be cut off, and even when by his duties he may be called to some place at a distance from the settlement, the utmost vigilance must be used. The arrows of the savages are by no means such harmless things as they are represented. Only on the 4th of March, three men, who had landed from the surveying ship *Mutlah*, to erect a flagstaff, were cut off. They had been working on an islet communicating at certain times of the tide with the mainland; nothing had been observed to awaken suspicion; but just when they were most secure, a large body of the natives appeared and slaughtered the men before they could get into the boat, which the Lascars in their trepidation had pushed off from the shore. The bodies of the white men, for two of the party were Europeans, were left on the shore, but the body of one of their party, a native of this country, was carried off. The islanders are reputed cannibals. It is hard to say what can or will be done with these savages, who seem determined to wage a war of extermination. It is probable, however, that they will share the fate of the natives of Van Diemen Land, and disappear as civilization advances. About 500 Sepoys are on their way there already.

Sayings and Doings.

The Chilian Government steamer *Maria Isabel*, recently purchased in England for 200,000 dollars, has been lost in Missericordia Bay, in the straits of Magellan. Her crew, consisting of 117 persons, was saved by the Sardinian barque *San Giorgio*, and has arrived at Valparaiso.

About eighty pieces of cannon from the foundries at Liege, for the Sultan, have just arrived at Antwerp by the railway. They will be shipped in a few days for Constantinople.

The Queen has been pleased to appoint Capt. Charles Edmunds, R.N., to be captain of the port at Gibraltar.

Twenty-two vessels were captured by English cruisers during the last twelve months for being engaged in the slave trade. All but one were Americans, and the larger number belonged to New York, Boston, and New Orleans.

The Elder Brethren of the Trinity House have voted an additional donation of £50 to the Royal National Lifeboat Institution. Few bodies are more capable than the Elder Brethren of knowing and appreciating the valuable and constant services of the lifeboats of the National Lifeboat Society in rescuing shipwrecked persons on the coast.

The ship which conveyed General Wolfe to Quebec, the *William and Ann*, foundered a short time since off Madeira, coal laden. The ship was originally a bomb ketch of 350 tons, and belonged to the Royal Navy, was built in 1759, and has been in constant employment from that time, latterly in the coal trade.

The Paris correspondent of the *Nord* of Brussels states that at the late conference held by the representatives of the different Powers who have made use of the invention of Professor Morse for electric telegraphs, the sum proposed to allow him was an annuity for life of 50,000 francs, (£2,000,) or a sum, once paid, of 400,000 francs (£16,000).

The French Government intend to bring in a bill to the Chambers to provide for the purchase of Napoleon's house and tomb at St. Helena. The cost is estimated at 180,000 francs.

There are now building in this country ten Turkish ships of war, to enable the Ottoman Government to carry out the Treaty of Paris. Four of these are being built by Messrs. White of Cowes, and consist of two corvettes of 800 tons, one dispatch gun-vessel, 600 tons, and a gunboat, 200 tons; the remainder are building in London.

At the Central Criminal Court on Thursday the 14th of May, William Lakey, late master of the *Clipper*, was convicted of scuttling and sinking that vessel, and sentenced to eight years' penal servitude. The *Clipper* was covered by a policy for £800, and Lakey's personal effects were also insured to the amount of £150. Mr. Baron Martin, in passing sentence, spoke of the offence committed by Lakey in terms of well merited severity.

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

JULY, 1858.

Voyage of H.M.S. "Cyclops," Captain W. J. S. Pullen, to the Red Sea, 1857–8.

My first attempt in deep sounding was in the vicinity of the Devil Rock, and the first cast of 1,500 fathoms was not more than two miles from three of the assigned positions, and thirty-eight from the most distant and easterly of them. The position given by the *Brisk* was thirty miles due South (true) from that sounding. From the unfavourable state of weather for such work I could only get at it the next day, after lying by nearly all night, in hopes of dropping the lead over some of the central positions. But I rounded to quite on the top of this particular spot, and payed out 2,200 fathoms of line without any reason to suppose, from intervals, that the weight was on the bottom. And, taking into account the heavy sea on, making it nearly impossible to keep the ship up to the point desired, I considered that only 1,800 fathoms was the vertical depth reached. Unfortunately the line broke while coming in.

In the first cast the weight was brought up again, a most convincing proof that it had not reached bottom; and as this last cast was not more than nine miles from several of the surrounding positions, with that as a radius it will embrace all, taking either sounding as a centre. And as we may naturally suppose that no rock rising from such a depth as we may expect to find here would be without a proportional base, I conclude, by not reaching bottom with such a length of line, that it cannot exist, at all events any where within the circles

described with the radius of nine miles. I only regret that the weather was such, and that I could not devote more time to sounding.

On leaving England, I had purposed calling at Madeira to fill up coal and test my chronometers; but the small pox broke out amongst us, and, having a strong fair wind, I passed well to the westward, in hopes of being able to make the whole run to the Cape without replenishing;—at any rate to get as far as Rio. But I was mistaken, for instead of finding the N.E. trade where I expected it, nearly all the way to St. Vincents the wind was from South and S.S.W. The ship would do nothing without steam, and consequently I put into Porto Grande to fill up the boxes. Captain Richards had been here in the *Plumper*, I found, and left the result of his observations with the Consul. I was glad, too, that mine differed only 3·5s. in time from it.

Porto Grande is a good harbour, but not an atom of stock, &c., was to be obtained there for any money. All the time we remained the trade was blowing fresh and steady, but the very day we left it came in light breezes from S.S.W. And so it continued the whole way to the equator, but variable, and with what little N.E. wind we had it seemed as if the trade had completely exhausted itself. The S.E. was the same, and to Simon Bay I can safely say that I have rarely gone over such an extent of ocean, hardly in the Pacific, and experienced such light winds and beautiful weather.

In passing over the position given to the Hannah Shoal, I could not get bottom with 2,000 fathoms of line. The next cast was in 4° 16′ N. and 28° 42′ W., St. Pauls Isle bearing S. 14° W. 202 miles. I was steering to cross the equator in about 30° W., endeavouring as much as possible to follow Maury's directions.—I would not do so again! In this position I found bottom at 2,100 fathoms, but had not yet brought up any specimen from the fact that all our casts as yet, except those for temperature and the Devil Rock, have been made from a boat with mackerel line; and which line I find equal to the purpose when bringing up specimens or getting temperatures is not an object. However, the former part I hope to accomplish yet with it, for, from experiments I have tried on board, the breaking strain varies from 80lbs. to 140lbs., and we have with success, as far as getting depths, weighted this line with 60lbs.; therefore I think that a less weight (say 35lbs., detaching), with a small rod and valve, bottom may be brought up from 1,000 fathoms. As yet, I have had no opportunity of trying, for it must be calm weather and from the boat, for which reason it would be a long operation. But by making this line available our silk lines will not be needed. Again, if these mackerel lines were made with more care, which I think they might be, there would not be so much range in their breaking strain.

The next cast was made from the ship with a larger line, as I intended to bring up the bottom, and attached two thermometers for temperature. I am happy to say this was successful, reaching a depth of 1,080 fathoms, in lat. 2° 20′ N. and long. 28° 44′ W., St. Pauls bearing S. 26° W., 90 miles distant. The valve brought up a

plentiful supply of bottom, consisting of a fine greyish sand, a portion of which I send home, amongst other specimens from the bottom, as well as water from various depths, all duly labelled, with every particular. The thermometers came up, showing a minimum temperature at 1,080 fathoms of 38·5°; at 680 fathoms, 46·2°. Density was also taken and duly tabulated.

Drawing now so near the equator, I determined on having a cast, if possible, directly on it; and the next day, in 0° 5′ S. lat. and 29° 0′ W. long., was again successful with 1,080 fathoms. This particular sounding was obtained from a boat with the mackerel line, while from the ship, with the regular deep sea line, the endeavour was made to combine the experiments, as yesterday. But here we failed, and, I am sorry to say, lost not only a large quantity of the line but both thermometers. And, I now see, in consequence of more line having been payed out than was actually necessary, that current and drift took it away in a bight, so that, on being hauled up, the friction was too great for its strength and it parted whilst coming in. I also thus found that such experiments must not be combined to arrive at true results for depth. But to show my meaning more fully I shall transcribe a few paragraphs from my journal on the subject:—

In this sounding for temperature I used Mr. Skead's detaching apparatus, with the deep sea line, and a 68lb. shot for sinker. The two thermometers were attached: one just inside the weight, and of course let go at the same time; the other by stopping the line as it went out at the length determined on, in this case 400 fathoms, &c. All thermometers brought to surface temperature before starting, by remaining sufficiently long in water alongside, and compared. This stopping of the line I consider objectionable in sounding for bottom; this object and that of temperatures ought to be separate experiments.

After letting go the weight, the line grew so much on the bow that all I could do, with nearly a calm, did not keep the ship in position from drift, besides the westerly current our reckoning gave us; so that, after veering out 300 fathoms, I had it all reeled in again.

On letting go again the same difficulty was found after getting 500 fathoms out, and the intervals showing so irregular, that I felt how uncertain it was to decide when the weight reached the bottom; and at length, finding all dependance on results was gone, having run out 1,800 fathoms of line, I stopped and commenced reeling in. From the way in which the line came in, with a heavy strain and lying across the forefoot, rather than up and down, or on the port bow, appearing as if a drag was on it below greater than could be caused by ship's drift from surface current, &c., I concluded this to be what Maury styles the under current acting on the bight of the line with a *surging* force, and doubted very much the recovery of any of the line. It was soon settled, for after reeling in 600 fathoms it parted, losing not only 1,150 fathoms of line, but the two thermometers.

The boat now returned and reported having found bottom at 1,080 fathoms, and finding the current setting N. 65° W., true, half a mile

an hour. On looking over the table of intervals from ship, I saw that the first considerable change was from 800 to 900 fathoms; from which it may be concluded that the weight was down, and all the slack line drifting with current across the bows. Hence the difficulty of getting it in. But the finding 1,080 fathoms not more than a quarter of a mile from the ship seems to show the improbability of the weight being down at 800 fathoms,—too much difference in so short a distance. Yet it may be possible by the leads being on a sloping part or spur of the chain of submarine mountains said to exist between the nearest points of the two continents; or, rather, near the base, on the rise of what St. Pauls may be the peak, considering the 1,080 fathoms the extreme of the base in this direction. At all events, this sounding has given me a lesson, and one pretty plainly saying that for temperature and bottom the experiments *must* be separate to arrive at a true result.

I have before this cast noticed how irregular the intervals always are in getting temperatures, especially with more than one thermometer on the line, but never thoroughly considered the cause, or the results likely to follow from the increased weight. For, although the addition of the thermometer, weighing in the bottle about six pounds, gives rapidity to the descent of the weight, its bulk offers great resistance on coming in,—consequently the line is more liable to part. And when it is intended to send down more than one instrument the line must be stopped to attach, which at once checks the rapidity of descent; the line has then to be lighted off the reel with more force, impossible to apply equally, and the intervals become so irregular that all certainty is gone as to when the sinker is down, and you feel at a loss when to stop.

From this lesson I think we have profited, for not a single fathom of line has been lost since, although going to double the depth with success; and which I shall now relate, but first saying that at every tenth degree South of the equator I had temperatures generally with three thermometers on a single line at 1,200, 800, and 400 fathoms down. Observations for variation constantly; and swinging for deviation every fifth parallel, observing at least on eight points of the compass.

And now for this deep sounding, of which, as far as proof of getting bottom and temperature, we have full evidence. And I cannot find that even the Americans have done so before us, or any one else, and I trust that it will not be the last of such experiments with us.

On the morning of the 19th December, in lat. 26° 46′ S. and long. 23° 52′ W., nearly midway between two positions on the chart where Sir James Ross had sounded without getting bottom,* I found it with 2,700 fathoms of line. Just one hour after the weight was let go

* We understand that this is erroneous although it has remained some years on the chart, Sir James Ross having now stated that he had bottom.

the intervals showed it was at the bottom, and in two hours more the whole apparatus was safely inboard, the valve bringing in a plentiful specimen of the bottom, a very fine brown mud or sand; and thermometer sent down with it showing a minimum temperature of 35°. One of Massey's machines, too, was sent down, returning registering 326 fathoms less than the line; but this particular one has been so altered and, I may say, improved on, that for trials for index error we bring the difference down to 44 only, not much in so great a depth.

Everything as far as weather here was favourable, except that there was no wind, which I consider is required, as far as the *Cyclops* is concerned, to keep her with canvas set where the weight was let go. In fact, with all paddles it is the same, for they do not answer the helm quickly enough, nor until they get good way, when they are far ahead of the necessary position. I therefore consider that a screw vessel would be very much better adapted for deep sea sounding, they are so notorious for being quick in answering the helm, almost, indeed, directly the propeller begins to move.

This was the last cast for bottom that I had in the Atlantic, and, considering how little difference there is between it and the two of Sir James Ross, particularly that to the eastward, they cannot be far out, if the casts were taken from a boat. I regret much that I could not go so far out of my route to try at Denham's 4,200 fathoms. At Tristan da Cunha I merely remained long enough to land the stores I was charged with and to get a little fresh meat for the crew. But I had the dredge over there in 42 fathoms: it brought up nothing but a few stones. On the 6th January I anchored in Simons Bay.

Here I had a very serious mischief to patch up, in the shape of the foremost paddle beam badly sprung, and gone so far through that, should the old ship encounter any heavy weather, I fear she would come but badly out of it. It was only discovered between Tristan and the Cape, and most fortunate was it that we had experienced such fine weather. To repair, or rather replace the beam, the ship must be docked, which could not be done here; therefore a large baulk of timber was bolted on the deck through to the beam, projecting at least three feet on each side of the sprung part, which even now, when the ship rolls, opens out at least the eighth of an inch. On arriving here I find the rent has increased.

Securing this, coaling, and rating my chronometers, &c., fully occupied me until the 20th, when I steamed out of the bay with a fine westerly wind, and a fair prospect of soon getting well out to sea. After passing Cape Hanglip and getting a good offing, such a heavy westerly gale came on that the old craft fairly staggered under it, barely keeping ahead of a fast following sea with full steam, close reefed fore topsail and foresail. She weathered it through pretty fairly (only the loss of a few bulwarks), and ran the easting down between the parallels of 35° and 38°.

It is between these parallels, or rather 35° and 40°, that so many doubtful dangers are marked on the charts; when, on nearing them,

the lead was brought into play, and two, I think, may be fairly expunged from the position they have so long held.

The first was the Brunswick, on which is marked 85 fathoms, deep enough certainly for any ship that floats; but, to remove all doubt, I had two casts not far from it of 1,410 and 1,102 fathoms without reaching bottom.

The next was the Atalanta Shoal, seen by two ships, an American and a Dutchman, the latter reporting it as an extensive shoal under water, with several pointed rocks above surface on its western part; both give the position different. I therefore laid it down on our chart in three several places. I passed from the westward between the most northern position and the first of the southern ones, and got four deep casts, besides several of 50 and 80 fathoms, in their vicinity. The first was down by intervals of time noted to 1,110 fathoms, but, only part of the rod coming up again, the valve having broken off by striking some hard substance either on the bottom or on passage up and down, I felt doubtful about the cast. I did not like leaving with this uncertainty, and as there was no time to get another cast before dark, with such fine weather and nearly calm, I determined on trying if we could not manage by lantern light. For it is fully necessary to have light in carrying on the experiments, to see how the line is going down and the marks as they go out. After placing all the lanterns the lead was let go, and I had the satisfaction of getting as good a series of intervals as with many soundings we have made by daylight. Moreover proving that our first cast was right, for this time the lead was down at 1,120 fathoms, and, as a further satisfaction, the valve bringing up a specimen of the bottom, appearing to be fine light coloured sand over a hard bottom. The next morning, having laid by nearly all night, with 800 fathoms I found no bottom; and a little further N.E. the lead was down at 900 fathoms. Here the valve brought up a specimen again similar to that which we had the preceding night, with a small pebble in it; and when a portion of this specimen was placed under the microscope it proved to be some of the most beautiful species of the *Diatomaceæ* that can be imagined.

From this last sounding the course was more northerly, and considering what could have given rise to the report of pointed rocks, and how to account for finding such shoal water so far from any land, six and eight hundred miles,—the Crozets on the one hand and South point of Madagascar on the other,—thought it possible that a less depth might be met with, and, further, that this vicinity ought to have a closer examination. Again, it might possibly be that the Indian Ocean was not so deep as the Atlantic; but this opinion I have since proved to be incorrect, and have very good reason for concluding from soundings since obtained that it may be equally deep if not deeper. However, looking to the westward, something like a break caught my eye, but being the only person who could see it, I thought that I was deceived by the mirage, and perhaps imagination, from dwelling so long on the subject of rocks, and went below.

In the course of half an hour the officer of the watch reports pass-

ing broken water to the S.E., just in the opposite direction to where I had seen a like object, but this time there was certainly no deception; the description given was that it had the appearance of water rushing and foaming over broken ground like a mill stream. From the distance, with a glass, it most decidedly looked like breakers; and, being under steam, almost a dead calm, I bore away for it. Nearing it, it lost the appearance of break, but showed a white milky substance, in large patches, spread over a considerable surface, with strips of dark water between, showing as the deepest water; this, together with the long undulating motion from the S.W. swell, had caused it to appear, from a distance, as if breaking. A boat was lowered down, and a bucket of it procured, and finally I steamed through it and with 145 fathoms found no bottom.

This appearance, I have no doubt, without examination, has given rise to the reports of so many dangers seen between these parallels, and one circumstance which took place with us, will I think show how one may be deceived. The captain of the forecastle, not knowing that the course had been altered, or that anything extraordinary was going on, suddenly looked out ahead, and shouted most lustily, "Broken water ahead, Sir,"—this, too, when we were close to it.

About the Brunswick Shoal, also, for two days we were passing through what at a distance might be mistaken for sand spits, which on examination proved to be a small gelatinous polypi with a small crustacea in the head, of a yellow and brownish appearance, which, seen in such immense quantities, might easily deceive at a distance, especially in former days, when such things were not so closely looked into as now. What to call this white substance I do not know, but have endeavoured to preserve some of it in spirits of wine to send home. There were infusoriæ amongst it, and small crustaceæ found the next day.

Steering now to pass to the Westward of the Mauritius, a little South of the parallel of 20°, distant from the land ninety miles, I could not get bottom with 1,375 fathoms of line. This first showed me the improbability of the Indian Ocean being of lesser depth than the Atlantic. Proceeding Northward, I passed up to the Westward of Cargados Gasayos, Saya de Malha, East of Seychelles, and crossed the equator in 58° 20′ E., getting a cast nine miles South of it, with 2,380 fathoms, no bottom.

Between forty and fifty miles West of the Northern part of the Cargadas got bottom with 1,400 fathoms of line. In 14° 41′ S., 58° 43′ E., no bottom with 1,570 fathoms; 10° 30′ S., and 58° 52′ E., no bottom with 1,320 fathoms; and passing near where 185 fathoms are marked on the chart N.W. of the Saya de Malha, no bottom with 200 fathoms.

Wind now light from Northward, when I was close to the doubtful George Island, and about three quarters of a mile West of its Southern part 2,000 fathoms of line would not reach bottom. Passed over this island, nearly a mile within its Southern point, and not finding the ship on shore, conclude that such an island never existed here.

In Horsburgh I find no mention of it. Steaming to pass near Rose Galley Rocks, the next morning, five miles South of the most Western one, found bottom with 2,254 fathoms of line, the valve bringing in plentiful specimens from that depth; and the thermometer sent down showed a minimum temperature of 35°. The thermometer from the 2,000 fathoms depth yesterday showed 38·5°. Now 35° was the minimum temperature at the 2,700 fathoms depth in the Atlantic further South than this by Rose Galley. May we not therefore infer that 35° is the minimum temperature of the great depths of the ocean?

But I am sorry to say that the thermometers are hardly to be depended on, for up to this time I have invariably found that on their return the tell-tale in the maximum column has shown very different from what it did on starting, viz., the surface temperature, from which we may conclude that the minimum tell-tale has moved also. My attention was first called to this by seeing Admiral Owen shake them down in a weather thermometer of Six's we had in the Bay of Fundy. And Mr. Maclear, the Astronomer at the Cape, also spoke of it, taking up one of our deep sea thermometers when he was on board, and quite altering the indices with a very little motion, less than the line is likely to give it on its passage up and down. This must be for the maker's consideration, for it is beyond our control.

After this sounding by the Rose Galley Rocks I passed about one mile West of the Westernmost one, and could not detect the slightest break or disturbance in the sea anywhere. Approaching Swift Bank I commenced sounding with 150 fathoms only; and carried a line of that depth over this bank without reaching bottom. I therefore conclude that none of these banks, rocks, or islands exist. I am sorry that we were not led over the Bridgewater or doubtful Roquepiz; it was too far to the West, for every mile with us was important; and I can only excuse in any way this working on Sunday by necessity for removing dangers from the highways of the ocean.

I found the N.E. monsoon South of the line never very strong, and almost up to Socotra found a strong South and Westerly set, sometimes as much as fifty miles in the twenty-four hours. I passed between Socotra and Guadafui with a current setting N. 28° E., twenty-two miles, since which it has been variable, wind generally N.E. and East, hauling to the first quarter during the night, and getting light, but going back to the Eastward in the day and freshing. And I reached Aden on the forenoon of the 15th.

It may be as well if we collect the foregoing into one view and arrange them in the following tabulated form.*

* Commander Dayman, in the *Cyclops*, has just added an important sounding of 2,525 fathoms in lat. 47° 12′ N., and nearly on the meridian of 10° W., the scene of the late experiments with the Atlantic cable.

Atlantic Ocean.

Lat.	*Long.*	*Depth.*	*Remarks.*
° ′	° ′		
46 42 N.	13 5 W.	1500	Devil Rock: no bottom.
46 12	13 3	1800	
10 0	27 30	2000	Hannah: no bottom.
4 16	28 42	2100	Near St. Paul Island.
2 20	28 44	1080	
0 5 S.	29 0	1080	
26 46	23 52	2700	S.E. of Trinidad ⅓ to Tristan da Cunha

Indian Ocean.

Brunswick, of 85 fms., 1410 and 1102, no bottom Atalanta, 1110, 1120; to N.E., 900			East of Cape.
S. of 20°, land	90′ distant	1375	No bottom.
0 9 S.	58 20 E.	2380	N.E. of Seychelles: no bottom.
40′ to 50′ W. of	N. Cargados	1400	
14 41 S.	58 43 E.	1570	East Cape Amber, Madagascar: no bottom.
10 30	58 52	1320	
N.W. of Saya	de Malha Bk.	200	no bottom: E.S.E. of Seychelles.
Rose Galley R.	5′ S. of Westn.	2254	

And, first, of our old friend the Devil Rock, which has so often been the subject of discussion in these pages, and caused many an anxious hour to the weary mariner. We have just met with a passage concerning this same vigia, from the pen of Admiral Robinson, with which we so entirely agree that we shall repeat it here. He says:—

In the *United Service Journal* of October, 1834, is an account of a rencontre with this Satanic shoal, which I shall transcribe for the benefit of those who may not see that useful publication.

"The time was about 11h. p.m. In a moment the cry of breakers went through the ship, and so sudden, so unexpected, was the danger of destruction, that hope of safety there was none. The ship was flying through the water, the breakers not more than two cables' length off, not only ahead but several points on each bow. The black tops of the reef of rocks were seen occasionally, bound by the reflex of the surf. The ship was in the midst of breakers, two mighty surges swept over her decks and carried everything loose into the sea. The reefs among which she was entering appeared to enclose her like a horse-shoe, forming a barrier of foaming surf ahead and for several points abaft the beam on each side. But by the aid of a powerful moonlight the captain espied a spot of dark water to

larboard, forming a gap in the line of breakers. We neared the spot fast, it widened as we advanced, and the ship, by excellent seamanship, shot through a channel, scarcely half a cable's length wide, between two swells of gigantic breakers. The reef seemed to extend from N.W. to S.W. in a semicircular direction, its convex side turning to the East, presenting for apparently a distance of three or four miles a line of tumbling and whitened foam.

"The sails being now trimmed, the ship was once more put before the wind and bounded buoyantly on the white heads of the breakers, which grew less and less apparent and were seen only at intervals, whilst the sound of the thundering rush was lost in the hollow murmuring of the wind."—*Nautical Magazine*, Dec., 1834, page 787. (See also Captain Livingston's communication on this subject.)

This is very interesting, but it is told either by a man who is not a sailor, or it was polished up subsequently and spoiled. A person who does not know fully his subject may pass off in conversation, but commits himself when he sits down to write. Shakspeare never could have been at sea, or he would not have made Trinculo tell such stuff as, "Yare, there, yare; tend to the master's whistle. We split, we split, to prayers, to prayers!" Nor Swift, how, "On the 12th of November it came on to blow heavy. We lashed the lanyard of the whip staff, and set her a trip," &c. Nobody, now, would write such nonsense, which was nonsense at the time. We are told now by Lady Morgan of the ship bearing into port, instead of standing; and the sheets, which are ropes, are confounded by her and others with the sails, which are canvas. Miss Edgeworth had a great fancy for law, of which she knew nothing, and she indulged in legal points which would have shocked an attorney's clerk. If she had kept within the four corners of her imagination and her experience she would have been all right, but technical subtleties were not in her brief, she should never have travelled into them.

Again, the crowd of novels, as we have already remarked, which describe fashionable life, are written, for the greater part, by persons with whom that life was evidently not familiar; and accordingly, by occasional solecisms and touches of almost impalpable vulgarity, contempt is excited for works which are otherwise often so graphic and clever; they fail just by a phrase or word. When the author would "say Shibboleth he said Sibboleth, for he could not frame to pronounce it right." And thus it is that men who would pass muster in talk, break down so often when they go to write.

> "O why, my Lord Warden, oh why need you fidget
> Your mind about matters you don't understand;
> And why need you write yourself down for an idiot,
> Because you forsooth have a pen in your hand."

This is usually of little consequence (except to the fame of the author) but it is of great importance when naked unvarnished testimony is required.

Every touch of imagination which enters into hydrographical description discredits its hydrographical accuracy. Every account of a danger to be avoided should be as free from ornament as a table of the moon's declination or of the right ascension of Jupiter. Therefore the "*gigantic* breakers," and "the whitened foam," and "the thundering crash," and "hollow murmuring of the wind," should have been omitted from the description of the Devil Rock. The suspicion that the account was written for effect leaves us in doubt of the truth of the story altogether. However, I think we have (beyond this gaudy) sufficient evidence of the existence of the danger, and though the accounts differ as to the longitude, showing clearly that there is somewhere hereabouts a customer who had better be avoided of a dark night."

Agreeing, as we do, with our Admiral in the main observation concerning the dressing up of such accounts, we believe it may be owing to our making the extract he has quoted from our pages, as well as from other accounts that we have collected, that Captain Pullen was directed to explore the place of this notable danger, and which seems to have no reality about it. And instead of a rock we must therefore set down all the reports concerning it to nothing more than balks of timber, remains of wrecks, and trunks of trees, drifted into that part of the ocean by the general effect of the Gulf Stream, where, by the different positions assigned to the rock, they seem to indicate a kind of resting place of the waters from whence to return by a Southern route into the equatorial current and the gulf from whence they came. We shall therefore lay it aside for the present, but may recommend its locality for the further favour of the lead, when the chart shows the bottom of the Atlantic as plainly as it does that of the English Channel.

The Hannah Shoal Captain Pullen has completely set aside; and three soundings on the bank of St. Paul form an interesting contribution to the North and South profile of that bank, on which the little island is just seen peering above the surface of the waters.

We are glad to see the extraordinary deep sounding of Captain Denham (7,706 fms.) in this part diminished into its more probable dimensions of 4,600 fathoms, as shown by Lieutenant Maury in a former page of this work.* The sounding obtained by Captain Pullen, also to the S.E. of Tristan da Cunha, is most important and satisfactory, and we are glad of the opportunity of placing on record the times showing the progress of the lead in finding the bottom.

The following sounding will now take its place as one of the best established in the South Atlantic.

* Vol. 1853, August number, page 393.

December 19th, 1857, a.m., lat. 26° 46′ S., long. 28° 52′ W.

Fathoms.	*Times.*	*Interval.*	*Diff.*	*Remarks.*
	h m s	m s	s	
	4 48 30	let go.		Therm. 10 attached.
100	49 2	0 32		Surface temp., 75°.
200	50 2	1 0	28	
300	51 19	1 17	17	Deep sea line used, with detaching weight of 120lbs. and Massey's machine, No. 1318, with cylindrical shield and lever stop.
400	52 51	1 32	15	
500	54 34	1 43	11	
600	56 24	1 50	7	
700	58 21	1 57	7	
800	5 0 25	2 4	7	
900	2 32	2 7	3	
1000	4 45	2 13	6	Calm, still weather.
1100	7 4	2 19	6	
1200	9 23	2 19	0	
1300	11 45	2 22	3	
1400	14 11	2 26	4	
1500	16 40	2 29	3	
1600	19 11	2 31	2	
1700	21 43	2 32	1	
1800	24 15	2 32	0	
1900	26 50	2 35	3	
2000	29 29	2 39	4	
2100	32 9	2 40	1	
2200	34 49	2 40	0	
2300	37 27	2 38	—2	
2400	40 9	2 42	4	
2500	42 53	2 44	2	
2600	45 47	2 54	10	Down at 2700 fathoms.
2700	48 30	2 43	—11	
2800	51 55	3 25	42	

In respect of those in the Indian Ocean, those East of the Cape near its parallel are useful, as well as those further North. Capt. Pullen has done good service to the chart, also, in exploding the Rose Galley Rocks and George Island, as well as in finding bottom near the line to the N.E. of the Seychelle Archipelago at the depth of 2,580 fathoms, being the first contribution towards ascertaining the declivity of the submarine mountain on which that group is seated. These deep soundings in thus bringing to light these submarine valleys and mountains are no less interesting to the philosopher than they are of benefit to the seaman in the explosion of vigias from the chart, and in showing the possibility or impossibility of a rock being in existence wherever it may be reported. We are glad to see the time approaching when they are likely to be spread over the different oceans of our globe.

CHRONOMETER ROUTINE—*in Supplying Her Majesty's Ships.*

The Royal Observato y at Greenwich is the chief depot for the Government chronometers.

All Government chronometers are rated there, and their characters under high and low temperature ascertained.

Purchase of Chronometers.—Makers are invited every year to send one (sometimes two) chronometers on trial for purchase. They are deposited in the end of December, and collectively vary in number from twenty to forty.

In the course of the winter they are subjected to a low temperature out of doors, and also to a high artificial heat by stove in winter—as well as being out of doors in summer. They are occasionally changed in position in reference to the meridian, and so rated with the view to any magnetic effect being evident in their rate; and at the end of seven months a report to the Admiralty is made of their merits by the Astronomer Royal, along with his opinion of the value which may be attached to them severally.

A purchase is then made by the Government of those required, and the rest are taken away by their owners.

The rates of all on these trials are published and distributed to their makers.

The foregoing is considered the annual trial for the makers. It is looked for by them as an encouragement due to the art by Government; each maker communicating to the Astronomer Royal any new invention (under secrecy) which his chronometer may contain, and for which he may have a patent.

Any chronometer required by Government, or which the Government may be requested to purchase, always undergoes its trial at the Royal Observatory.

On a chronometer being purchased by the Government, it immediately receives the Government mark, and is entered in books kept at the Admiralty and at the Observatory.

Supply of Chronometers for Service.—For the supply of chronometers for service, there are depots, besides the Royal Observatory, at Portsmouth and Plymouth; the former at the Royal Naval College in charge of the Professor, the latter in that of a trusty optician at Devonport (Mr. Cox of Fore Street.) The daily rates of the chronometers at these depots are noted,—the time being obtained by transit instrument,—and a statement of the r rates, as well as of those at the Royal Observatory, is made weekly to the Admiralty.

The returns of rates contain always a statement of the receipt and disposal of chronometers at those places, from whence they came, or to whom they are given, and in the latter case the receipts, signed by the officers in command who take them, are transmitted with the returns to the Admiralty.

A supply of about twelve chronometers at a time is sent from the

Royal Observatory to the coast depots abovementioned, which are thus kept completed by measures adopted at the Admiralty when the returns show them to be wanted. They are selected from the Observatory return, and orders are sent to the commander of a ship going either to Portsmouth or Plymouth to send for and obtain them from the Observatory; and the Astronomer Royal is requested to supply them accordingly,—no Government chronometer being ever allowed to go from the Observatory for service without an Admiralty order.

Officers' Supplies.—When an officer in command is ready for sea, if at Portsmouth or Plymouth, he makes application to the Admiral Commanding-in-Chief to be allowed to have the chronometers usually allotted to the ship; and in every such case, when there is a private chronometer on board belonging to the captain or to an officer of that ship, an allowance of two is made by the Admiralty for navigating the ship: but where there is none on board, one only is allowed. The order for one or two being thus obtained, the officer, on his application at the depot, receives the chronometer or chronometers ordered, and his receipt for them is transmitted to the Admiralty. The chronometer or chronometers so supplied remain charged to him on the books until returned at home—unless transferred to another officer or ship abroad.

At any other places except Portsmouth or Plymouth, applications for chronometers from the captains of ships are made to the Secretary of the Admiralty through their Admirals, and the chronometers are in these cases selected from those in the Observatory returns, their rates showing them to be fit for service, and orders are sent accordingly to these officers specifying the chronometers assigned for them, and the Astronomer Royal is also requested to deliver them on application for them.

Any officers proceeding on scientific expeditions for geographic or other special important purposes, obtain them in like manner: if naval through the Commander-in-Chief; but if civil or military through the Hydrographer or the Secretary to the Admiralty.

Surveying expeditions proceeding abroad are supplied with the numbers considered necessary in the opinion of the Hydrographer.

Rates of Chronometers Employed.—Periodical returns of the rates of chronometers employed in H.M. ships are made to the Admiralty, and preserved for reference.

Return of Chronometers on Conclusion of Voyage.—On the return of a ship home from abroad, the chronometers with which she may have been supplied, unless transferred to another ship abroad, are delivered at either of the depots, and their condition is reported. If returned at either of the port depots and in good order, they may be supplied again for a short period of service; but it most generally occurs that they are at least in a state requiring to be cleaned, or possibly more or less repair. They are then kept apart as inefficient, and sent to the Royal Observatory by occasional opportunities of vessels going to Woolwich. Those returned to the Royal Observa-

tory are also set apart for repairs. Reports are made to the Admiralty of these transactions, and the charge against the officers to whom they were supplied is removed, while at the same time the numbers and makers' names of the chronometers so returned appear in the weekly reports from the depots.

Any extraordinary or improper condition which a chronometer may have on being returned, is inquired into.

Repair of Chronometers.—A particular day of the week is set apart by the Astronomer Royal at the Royal Observatory for intercourse with the makers, as respects not only the repair of chronometers, but their frequenting the Observatory either on this subject or that of purchase, and that day is Monday.

In regard to the repair of a chronometer the maker of it or (if not alive) his successor is summoned to the Observatory by the Astronomer Royal to examine the chronometer, and to give an estimate at once of the expence of its repair. This estimate is considered, and if reasonable approved by the Astronomer Royal. The same is done with all the chronometers at the Observatory then requiring repair, and they are then removed by their several makers from the Observatory, the makers having also brought with them to the Observatory whatever other chronometers they had on hand repaired as being ready for service.

A monthly return is made to the Admiralty by the Astronomer Royal of the chronometers so taken away for repair, showing the particulars of the repairs to be made and the prices to be charged for making them. The monthly mean for the year past of such chronometers amounts to 14.

The following extract from the "Regulations of the Royal Observatory at Greenwich" shows, in the words of the Astronomer Royal, the general mode of proceeding in regard to chronometers. The regulations alluded to form the "Second Appendix" to the Greenwich Observations for 1852.

"The marine chronometers, the property of the Government, which are kept in store in the Royal Observatory, (usually about 100 in number,) are regularly rated; all are compared with a corrected solar clock once a week, and many are compared every day. Chronometers on trial for purchase, are exposed to alternations of heat (by means of a stove heated by flames of gas) and of cold (by exposure to the open air) and are in all cases compared every day. A report of the rates of all chronometers at the Observatory is made to the Admiralty every week."

"Chronometers are supplied from the store to the ships of the Royal Navy, on the indication of the Hydrographer.

"The Astronomer Royal judges on the necessity of repair to Government chronometers, communicates with chronometer makers, and sanctions the estimates of expense of repair given by them. Chronometer makers are admitted to the Royal Observatory, for the purpose of inspecting and removing the chronometers, and for other business on Mondays only. The sanctioned estimates are reported to the Ad-

miralty every month. The details of the business are in ordinary cases conducted by the First Assistant.

"The Astronomer Royal reports on the trial chronometers after a trial of six or seven months, and advises the Admiralty on their purchase. A digested abstract of the rates is annually printed and circulated among chronometer makers and others, and is attached to the annual volume of observations."

We have only to add in conclusion that the annual sum of one thousand pounds is applied to the purchase and repair of chronometers, and the mean sum for the last three years expended in the repair of chronometers amounts to £705 annually, the remaining £295 having been applied to the purchase of new ones.

All accounts and books of the disposal of chronometers are kept at the Admiralty, and the bills checked by the returns abovementioned paid quarterly, and the rates are bound in annual volumes.

As chronometers become old and unworthy of repair on account of improvements in the art, they are disposed of to the makers, who convert their parts to their purposes; such chronometers being replaced by new ones. The number at present belonging to the Royal Navy is about 730. The original date of supplying Government chronometers to the Navy is about 1805, when the late Hydrographer had one in H.M.S. *Woolwich* under his command.

Appropriation of the Annual Vote for the Purchase and Repair of Chronometers.

Years.	Sum voted by Parliament.	Sum Expended.	New Chronometers obtained.			Number of Chronometers Repaired.	Sum Expended in Repair of Chronometers.
			By Exchange for an old one for which £10 is allowed to Government.	By Purchase only.	Expended in these Purchases.		
	£.	£.			£.		£.
1850–1	600	620	..	4	237	..	383
1851–2	600	858	1	2	126	..	732
1852–3	600	540	..	3	168	107	372
1853–4	600	722	..	5	196	94	526
1854–5	600	792	..	6	269	105	523
1855–6	1000	952	4	3	287	120	665
1856–7	1000	963	2	6	282	201	681
1857–8	1000	997	3	3	226	169	771
1858–9	1000						

It will be seen by the foregoing table that although the sum annually voted between 1850 and 1856 was £600, it was impossible to keep down the expenditure for purchase and repairs consequent on the supply of the usual number required by H.M. ships.

The Red Sea Electric Cable.

In a former number of this journal we had occasion to look into the question of the communication with India, and in considering the two lines we showed the existing condition of the comparative advantages and disadvantages of the line by the Euphrates and that by the Red Sea. The absurdities raised against the latter, which unfortunately were too well calculated to work on the public mind, were then laid bare, and it is gratifying to find that every word we advanced has been confirmed by Capt. Pullen, the officer to whom we alluded as about to explore the bugbears of the "enormous depths of that sea," and the "sharp pointed coral rocks" which the writer brought forward to frighten capitalists from its quietness, and to advance his adopted line by the Euphrates. Indeed it was but the other day that a long letter appeared from some one, we forget whom, claiming to be considered impartial, and wishing well (he said) to both lines; in which letter the writer occupied about a fifth part in disparagement of the Red Sea line, and the remaining four fifths in unmistakeable recommendation of the Euphrates line. So much for impartiality. For our part we are partial to that line which can be easiest and soonest done, and when done that will be least subject to the risk of destruction,—and this we consider to be the Red Sea line; and having *no other reasons* for our partiality to it than those, although we have no desire to see the other fail, we do hope to see this succeed, and that its progress may not be kept back because the other may not get on. Therefore, we reprint the Report of Capt. Pullen, and along with it the letters preceding and following it, as authorities on which dependence may be placed, because they are from a British officer, who speaks from experience, with *no other* motive (like ourselves) than a desire as soon as possible to see electric communication established with India. Capt. Pullen says:—

I am so satisfied from what I already know of the Red Sea that it is as well adapted for an electric cable as any other, that I hope I shall have to lay it down. Indeed, I feel more confident of success here than I should be in the Mediterranean with a similar work, and as much interested in it as if I represented the company itself. And hence I am annoyed when I read all the nonsense which appears in the papers about it. I suspect that not one of those men who speak so confidently against it have seen more of this sea than the flying passage by mail steamer affords them. I do not know how to do so, or I would speak stronger in favour of the Red Sea than I did in my report. But taking the line either in sections or direct down the middle of the sea, you may find a soft bottom. There is not the slightest difficulty that we cannot easily get over.

Again, measuring *fairly* on the chart, as you will, you cannot make the distance from Suez to Aden more than 1,300 miles; thence on to Bombay or Kurrachee 2,000, and even this would give a wide margin for deflections. Certainly in the *Times* of the 5th of May there are some good remarks. It is there most justly asked what security

have we against the wild tribes who dwell and hover around the proposed line of the Euphrates that they would not at any given moment (and that perhaps a critical one in our proceedings) turn the course of events by the simple expedient of *cutting the wires.*

How are we to guard against such a thing amongst men whose hand is against every one; and all the subsidizing in the world would not prevent it, aye, not even eight or ten years hence! Those wild tribes are the same they ever were, and ever will be to the end of time. And now, when the "coral reefs" are easily to be avoided, the "depths" not so very great, and the "furious gusts" a mere myth, what have we against the Red Sea more than the common difficulty of getting the wire down. As for me, I have very much more hope in it than in the Atlantic cable. Here we may calculate pretty certainly on the weather, but there you cannot, although no doubt that will be laid down too.

What do they mean about eight months to get it down between Suez and Aden? I suppose *making the cable* is included. As for laying it down, I do not think that will take more than a fortnight with a good powerful steamer, and I should prefer commencing at Aden. The greatest loss of time would be taking it on shore at the different stations. But I should propose parties to be there to secure the ends from the ship, and let her get on, so that there would be no delay with her part of the business, and she would be ready for another service. I should like much to take a line of soundings to our Australian colonies, thence to the Pacific, and so belt the whole world!

H.M. steamer Cyclops, Suez, April 15th.

Sir,—In compliance with their Lordships' orders, bearing date 9th January, 1858, which I found waiting my arrival at Aden, I proceeded first to Hodeidah, and beg to lay before you for their information a detailed account of all I have done respecting the laying a telegraph cable and establishing stations for working it between Suez and Aden.

On arrival at Hodeidah, the principal merchant, a Greek under British protection, came on board, and, learning what I required, offered to conduct me to the authorities of the place, informing me that the Pasha (Achmet Pasha) was away on an expedition against the Arabs. I accordingly landed, and was introduced to the Lieutenant-Governor, who gave me to understand that no difficulty would be thrown in the way of establishing a station for working a telegraph wire here, but that it would be necessary to get permission from Jiddah, to whose authority they are subject.

Walking round the town and along its sea face there are several spots where a cable may be brought in and the necessary place built for working it, but the risk would be of its being fouled and hooked up by the large native boats anchoring all along the sea face of the town, as I have shown in the small plan of Hodeidah obtained from

the Indian officers at Aden. The anchorage for large ships is at least two and a half geographical miles from the shore—not that I think they would come near the cable, for they could be placed within certain limits of bearing, yet they might possibly anchor on their way up and down the coast, particularly towards Ras Nejarula, which is much frequented.

Jiddah was the next place. In my letter from Aden I had not a very good idea of being able to establish a station at this port, by reason of the many outlying shoals and those lining the shore, over which the cable must necessarily lie. But, considering that it would be a most advantageous place, as being the chief port in the Red Sea, I have endeavoured to point out how all these difficulties may be overcome.

With the captain of the port I tried to carry a line of soundings from the anchorage of the ship to the town, but failed in every effort, frequently grounding with my gig in what this officer called "the channel," and which he states in the summer season is dry. After ineffectually trying at the top of high water I was obliged to give up the attempt to take a sufficient depth of water anywhere near the town for placing the cable securely; and, moreover, all this is on a coral bottom, so that the cable would not only run the risk of being picked up by the natives, who are constantly wading about over these places fishing and gathering shells, but chafed by the bottom, on which it must necessarily lie to get in to the shore; and nowhere do I see any other channel for bringing the cable in from seaward to the anchorage and out again but what I have marked in the accompanying plan, the northern red line being the one used by large ships both for entering and leaving the port. The bugalowes, or native boats, sometimes enter at the proper tide by that passage marked with the double red line, but it is full of stones, and at low tide very little water in it.

I would therefore propose that a vessel be moored in the roads between the shoals marked Berry and Mayett, at the point of intersection of the red lines, or further up; where the *Cyclops* lay she anchored in eleven fathoms, and swinging could only find four; however, by mooring head and stern these inequalities would be got over.

My reasons are that, in the first place, I should imagine the telegraph could be worked quite as well from a ship as the shore; moreover, there it would be free from all obstruction or interference with any one.

The health of those working the cable would be insured, for Mr. Page informs me that the town itself is certainly not healthy, which cannot be wondered at where there are as many as 40,000 pilgrims in the place at one time, on their way to Mecca; and the vessel fitted with a condenser or Grant's galley would be independent of the shore as far as water is concerned, which is of very inferior quality. By these means a cable would be in a sufficient depth, and, as there is generally a soft bottom in the passages where the deepest water is found, it would soon be covered over.

This plan also I should say would be the cheapest, and a ship could readily be got at Calcutta (teak-built) to carry a good cargo of what is suitable for the market, such as rice, sugar, &c., which would meet a ready sale at Jiddah; even her spars, &c., would not be lost. Moor her head and stern off the town, where she would not only be clear of interference and meddling from the natives, which would perhaps be only from curiosity, but all the disagreeables of a Turkish town, and the authorities of the place would certainly throw no difficulties in the way—nay, would rather, I am certain, do all they could to protect and encourage it. All those merchants I had an opportunity of seeing and conversing with, through the Vice-Consul as interpreter, considered the establishment of such a thing here would not only be highly beneficial to their trade, &c., but do much good for the place. Learning that Mr. Page had been long in the Red Sea, and had visited many of the ports, I called upon him for any information he could give me that would be useful in establishing the telegraph. A copy of his reply I herewith forward, and think that his suggestions respecting Hodeidah are deserving of consideration.

Setting aside the chances of its being again attacked by the Arabs, the Island of Camaran seems to be in a better position for running the cable more direct from Jiddah, thence on to Perim; supplies can be got at either Loheia or Hodeidah. There is a small force of Turkish soldiers, I hear, at Camaran.

The next station was Cossier, and where the line of soundings was to commence I got a few deep casts in the sea both before and after leaving Jiddah, which are shown in the track chart. But on this track between these two ports, nearly about mid-channel, appears to be the deepest water in the Red Sea, for with 1,000 fathoms of line in one spot we could not get a bottom, and a little further on with 678 fathoms the weight was down. In getting the cable in to Cossier I see no difficulty whatever, so long as it can be laid clear of the bugalowes anchorage, and other native boats, which is close to the reef off the town, on which their anchors were laid while we were here; further out the water would be too deep, and I have shown on the plan with a red line where I think the cable ought to come in and the station-house be built, rather to the left of the town, looking at it from the anchorage. The Governor assured us that the natives would hardly interfere, for they were kept in pretty fair order, yet it would be requisite to buoy the cable a short way off the shore, over the shoalest water. He also stated that the water was wretchedly bad,—quite stinking.

Commencing with a cast of 78 fathoms, outside of Cossier, and about one mile from the breakers, I shaped a course, thinking it would certainly lead us on a line of less than 100 fathoms, in compliance with their Lordships' directions; but found that unless I steered among the shoals, thereby risking the safety of the ship, it could not be done, and the pilot became so alarmed, fancying that I intended doing so, as to wish to have no more charge. And had I gone nearer

the shore there would have been the probability of finding a rocky bottom, for I have always found, even when in a greater depth, while passing near shoals or rocky patches, that the bottom was of such a nature; and, in fact, although the line I have run looks a long way outside all reefs, it appeared to me that we were very much closer to them than our bearings gave on the chart. I was using Moresby's large scale, not being furnished with any other than a general chart of the Red Sea.

Shadwan was rounded very much short of a mile, yet we got a depth of 372 fathoms, rocky bottom, and through the Straits of Jubal it was the same on the line we ran, but it may possibly be that a little more to the right a softer bottom may be got. After getting into the shoal water, a little north of Jubal Island, the soundings up to Suez agreed pretty well with those shown on Moresby's chart.

Drawing a conclusion from this line of soundings, and from the depth got in crossing the sea, I do not think we can carry the line further south on this coast in a less depth than 400 fathoms, and supposing the crossing-place to Jiddah is either from Elba Cape or Ras Roway we know not the depth we may there find; again, between Ras Benas and Elba Cape there are many shoal patches which no ship could venture to go inside of; besides, it appears to me that the coast is not so well known as that north of Jiddah, and, moreover, the natives are said to be treacherous, should it be necessary to land. But, as it is so desirable to lay down the wire in sections, I think a better route might possibly be found close round Ras Mahomed, and even make that a station, from Ras Mahomed across in the direction to Moilah, and thence down as close outside the reefs as possible, where the bottom may be soft. Wedge appears to me to be a good place for a station having good water, and supplies easily obtained. It is spoken of favourably in the *Directory;* and I also got from Mr. Page, who has frequently visited it in passages up and down the sea in native boats, a good account. Or the line might be taken at once from Ras Mahomed over to the Arabian shore, through the deep water, to outside the shoals, thence down as near to them as possible to Jiddah. At all events, I think it right not to calculate throughout on a less depth than 400 fathoms.

And, in conclusion, I beg to observe that I think no place can be better adapted for laying a telegraph cable than the Red Sea; there certainly is the choice of routes, and throughout, on either shore, a soft bed may be got; the water is deep, though not more so, or even so much, as where other cables have been laid, except, perhaps, in the middle; and all we know of that yet is certainly of a nature to cause no injury. In the vacant spots within the entrance, &c., I should hardly imagine that very great depth would be found.

I have, &c.,

W. J. S. PULLEN, *Captain.*

To the Secretary of the Admiralty, London.

I begin to think, from what I have already experienced of these "furious gusts," that they are quite a myth. It is true we have some strong breezes, but nothing to prevent a cable being laid down; in fact, I would myself prefer doing this with a head wind, and I think I may safely say that nearly all the way up from Aden, we might have laid down a fishing line.

The means adopted at the Cape for securing the paddle or sponson beam, have up to this time shown that with all the jumping and rolling the ship has had, there is but very little further opening out in the rent. It is a large balk of timber bolted to the beam, through deck and all, four or five feet projecting either side of the spring; in fact, a fish,—a most unsightly affair, and to be done away with as soon as possible, but as long as we can do our work its looks, &c., are a very secondary consideration.

I have read over very attentively the article in the *Nautical* respecting the Red Sea Telegraph, and hope soon to show all the wise-ones, in spite of what they say to the contrary, that it is the best line for an electric cable. But first as to what I have already done. In my letter from Aden I could only give an opinion on what I saw from the charts, and the ideas of Indian officers: I consulted men, too, who had been a long time in the Red Sea: but since I have myself been in the sea, find that those ideas may be greatly amended; and I have acted on my own judgment.

First, I found that all the places mentioned are wanting in the one great necessary—water, and all provisions would have to be brought to them, some from a great distance, and Ras Meijamba very much open to the attacks of the Arabs. Mocha I certainly do not think a fit station. Hodeidah I see nothing against, further than the place of anchorage of the native boats. The ships in the roads can be placed within certain bearings, and kept clear of the cable either going in or coming out again; but it is shoal a long way off. And from what Mr. Vice-Consul Page, at Jiddah, said respecting the Arabs, I considered it advisable to suggest the island of Camaran. But I think Mr. Page's opinion is of value: he has been nineteen years in Egypt, and three at this port of Jiddah. He has traversed the sea frequently in the native boats between Jiddah and Suez, and appears to possess a fund of information on this part of the world.

Respecting Jiddah I could only form an opinion from Capt. Freshard's ideas, the senior Indian officer at Aden, who has been a long time in the sea; but the outlying dangers certainly look rather appalling. However, I find on visiting it, that it is quite as accessible as any other place, and there would be no very great difficulty in leading a cable either in to or out from the anchorage. But taking it directly into the town, would be another thing, for the coral reefs extend quite along the sea face, and I found difficulty in getting off and on shore with my boat. The ledges too are dry at certain seasons, and I see no where that you can bring the wire in clear of them. Hence my idea for having a ship moored in the harbour, and taking the cables into her. She would not only answer that purpose, but others; so

that no additional expense would accrue; in fact, I think it would soon be cleared.

I have shown where this hulk could lie, (moored of course,) and this would not only ensure the safety of the cable, but also the health of those working it, besides being free of all the disagreeables of a Turkish town, and Jiddah possesses not a few. It is, a great part of the year, full of fanatics in the shape of pilgrims, on their way to Mecca, and there are as many as forty thousand in the place at a time. And the water not being particularly good, under a burning sun you cannot wonder at its being unhealthy. Now in the ship, whatever wind or air is abroad, they would have it. She might be fitted with a condenser, and supply the merchant ships; besides being a depot for other stores in the nautical line; in fact, a coal depot, for I see no reason why steamers should not run between Suez and Jiddah, for it is evidently increasing in trade, and in the hands of British subjects, and therefore I think a most desirable place for a station.

From Jiddah I proceeded to Cossier. At the cast of 1,000 fathoms no bottom, I really thought the lead was down, or should have gone on; but from the sounding 678 afterwards got, and so near the weight could not have been far off the bottom.

Cossier has not good water for use; the Bey informed me that it was stinking; but bringing the cable in or taking it out again would not be any matter of difficulty, nor would there be any trouble from the natives, for they appear to be kept in very good order.

Here our continuous line was to commence, and very much to my astonishment I found, after the first cast, that I could not keep within the prescribed limits of 60 and 100 fathoms, without running very great risk to the safety of the ship, and considering that it would require a large one to lay the cable down, and once started with it she would have to go on day and night, a nearer approach to the shore could hardly be ventured on; and to tell you the plain truth, I found myself very much nearer the shore sometimes than I liked, and although on the chart the line run looks a long way off, the surf on the beach, and several of the patches, were distinctly visible, leading me often to think that the coast line might be a little better placed. The chart of the bay I now have shows the shoal off which the light-vessel is placed dry, but I have never found it so, there is water enough for the *Cyclops* each side of her, yet from angles I find the light-vessel itself right.

Before getting through the strait of Jubal you see we get into the shoal water, and thence up to Suez the soundings agree pretty well with Moresby's chart. But this strait would be the better for a light. I have recommended one, and have been talking to the Masters of the Mail Steamers on the subject.

You will find that generally on passing close to any patches of rock, &c., the bottom is hard, although in such deep water. A little further out we should doubtless find it soft, for you see by what I have got clear of these patches and the greater depths that the bottom is soft—quite a feather bed. But, in my opinion, it is non-

sense to advance hard bottom as being against the laying a cable; even supposing it is all hard I maintain that in such depths there is not motion sufficient to cause any disturbance that would chafe a cable.

Now, my reason for proposing the line on the eastern side of the Red Sea is that I think the line of deep water will be much shorter than if we follow down the western side and cross when abreast of Jiddah. It is possible that when crossing the mouth of Arabah we may find the water very deep. But, taking the line throughout from Suez to Aden, either by sections or direct, I conceive the cable may be laid down in a mean depth not exceeding 400 fathoms. Again, on the eastern shores, by taking it into the place I have named—Wedge, the only one North of Jiddah—I don't think you would be likely to find the Arabs troublesome, from what I can learn.

I might, too, have taken the line of soundings through to the westward of Shadwan, but the pilot objected; in fact, I nearly frightened the fellow out of his life on first starting from Cossier. I really thought he imagined I was going to run the ship on shore, for he said he must give up all charge. And he is one of the best pilots in the sea, spoken highly of by all the Indian officers who have been in it.

How true it is that when any great object is to be effected in different ways the advocates of each magnify the difficulties of the other, losing sight entirely of the good to be gained, until the community at large get so sickened with their bickerings that finally the whole thing is dropped altogether. I see that Sir H. Someone is against the Red Sea scheme. I suppose he has passed through it? Has he ever sounded or explored it in any way? By passing through it as you do in a mail steamer, it is impossible to form an opinion worth having on its capabilities? And, again, is the gentleman a sailor? Interest, I suppose, in the other, or a name in Syria are certainly motives. I do not think any one can say I am interested in either line further than that I should like to see the project carried out, as I firmly believe it will be for the benefit of all. And in speaking of this, coming directly under my observation and experience gained in it, on the point in dispute, I say that there are no difficulties to be overcome more than common to such an undertaking, greatly less than to be met with in the Atlantic cable, and by our being new at the work.

Now, whether those who talk against the Red Sea have experience I cannot say, but I think they are very wrong in their sweeping condemnation of it. Where does their information come from? As to the perils of the Red Sea, those who advance such know but little of sailors; and in the days of steam, too. They may possibly have got hold of some unfortunate merchant skipper, who has been sent out here with a cargo of coals by a grasping owner, in a rotten old craft, badly manned, badly found, and bad in every way,—and what sort of an account can you expect from such a source? Imagination can go a long way, and I see nothing more in the Red Sea than in the

Mediterranean;—it is nothing to be compared to our own channel. What are the tremendous and uncertain depths? Probably not more than 1,200 fathoms, and this I think is speaking at the very outside,—from experience, too. And from the very much less length of line that I reached bottom with so short a distance from the 1,000 fathoms where I found no bottom, and in about the centre of the broadest part of the sea, I am led to suppose that the deepest water is in a very narrow channel; then the "*tremendous*" vanishes at once. Indeed, since we have learned to fathom the ocean at greater depths than I have found here, and show not only what the temperature is, but the nature of the bottom, I do not consider any depth between even 500 and 1,000 tremendous, or beyond our reach for laying a cable in. It only becomes a matter of expense. And we could have laid a line the size of the Atlantic cable throughout the whole distance from Aden to Suez without the slightest difficulty, and down in a fortnight,—very likely less with a good powerful craft. What are the coral reefs?—all imagination again. Look at our deep casts, have we not very nearly on the whole line shown a soft bottom, with the exception when passing rocks and islands; but a little outside, I will venture to say it is all soft. But at such depths the disturbance or motion is little or nothing to affect anything lying over it. And I affirm without hesitation that *there is quite as much sand and mud in the Red Sea as in any other part of the world.* Moreover, I say it is possible, from what I have as yet seen, to get a cable down from Suez to Aden in a mean depth of 400 fathoms, on a bed, too, quite as soft as many that are made of feathers. The depth would be its safety, once get it down,—which I say again there is no difficulty in accomplishing.

What are these "furious gusts" in the Red Sea? Have we not men ready and willing to face them? Aye, and overcome them, too. If our ships were bugalowes and our sailors Arabs or Turks, then you might talk about these "furious gusts." And with all these modern inventions of steam to back us, a good and practicable route is to be thrown overboard for a puff of wind? None but landsmen could talk of such trash. Who would think of laying a cable over shoals scarcely covered? Let us find them first!

In neither of the routes through the Red Sea yet thought of, as far as I have been, can I see any. And that portion of the sea I have passed over, I say a cable can be laid free from rocks and shoals and coral patches. Moreover, although at times it does blow fresh—perhaps what a landsman would call a "furious gust,"—we never thought it such. It was only against our progress, but would not have prevented our laying a cable down, had that been our purpose.

But I trust to show a better route before I clear the Strait of Bab-el-Mandeb, and convince the most sceptical by downright figures that the depths are not so tremendous, or the distance so great. I think whoever asserted this must have done so at an after-dinner discussion, when ideas become magnified. Who is that "Friend of India," and from whom does he get his information? Some of the

passengers, I suppose, passing up or down the sea in a mail steamer,—*flying over it*,—people no more competent to give an opinion on the subject than a baby. Neither are the men navigating these ships. They pass over it on a certain route, with but little deviation;—then how can they possibly form an opinion? I have seen quite enough to convince me that their ideas on the subject are worth nothing, although they may be very good men, and up to their work, so far as keeping the ship on a required track.

On Manning the Royal Navy.

Sir,—Six years ago you opened your pages to my suggestions on the subject of devising the best means for manning the navy.

A short time after that paper appeared in your journal, this country found itself engaged in an extensive war with one of the most powerful states in Europe, the third, indeed, in importance and strength as a maritime power.

It would be needless to revert now to the general alarm which prevailed throughout the land at the helpless and defenceless state in which we were left when the Black Sea and Baltic fleets sailed, further than to observe that unless impressment or some other compulsory measure had been resorted to, the Admiralty, with all its admitted energy, could not have manned half a dozen more ships, whether for home defence or for re-inforcing our fleets abroad. It so happened we were in firm alliance with (next to ourselves) the strongest naval power in Europe—an adventitious circumstance which might not again occur; but so it was, and in consequence the dominion of the sea was firmly secured in our grasp as long as we held together. We have also reason to be thankful that the war was brought to a conclusion without a single mishap, a piece of extraordinary good fortune, to which, in some measure, may be attributed the fact that peace found us in possession of a fine and well organized fleet,—alas, now scattered to the winds! The ships remain, but where are the men? They are gone! and, sad to say, we really find ourselves at this moment as powerless to organize a considerable fleet, should any great emergency again arise, as we were before the war broke out.

Surely there must be something very wrong to produce this state of things, possessed, as we are known to be, of the largest and most patriotic maritime population in the world, and if we do not profit by our difficulties in 1853–4, there must be a supineness amongst us fearful to contemplate and damaging to our character as Englishmen.

Sir Charles Napier, as a British Admiral, has done himself great honour, and deserves well of his country for calling the attention of the nation, through parliament, to this state of things; and we may congratulate ourselves that he has been so nobly backed, not only by

the members of his profession—both royal and mercantile,—but by the House of Commons generally, in urging the Government to take the matter at once seriously in hand.

This difficult question is again handed over to a Royal Commission for consideration—perhaps the best means to be adopted. But I will venture to add, that if the voice of that Commission be not in the end sufficiently impressive to command attention and to insure a full acquiescence and fulfilment of its deliberate recommendations, much valuable time will have been lost, and the country will remain in a greater and more dangerous state of uncertainty than ever.

With these few preliminary remarks, I will now enter upon the subject I have undertaken to consider, viz., the importance of devising a sound and practical plan for manning the navy and establishing an efficient reserve of seamen.

At the risk of being accused of unnecessary repetition, I must again refer to the observations which I recorded in January, 1848,—the substance of which appeared in the May number of the *Nautical Magazine* for 1852,—believing, as I still continue to do, that those observations contained the foundation of much sound improvement as to the treatment and management of our seamen, and also, to a considerable extent, the solution of that great problem,—Whence arise the difficulties which are found in raising men for our fleets, and attaching them to the service when we have them?

Among the observations to which I referred are the following suggestions:—

1st.—A progressive improvement in the condition of the seaman by increasing his pay in proportion to his length of service,—thus offering him powerful inducements for his faithful and continuous servitude.

2nd.—An improvement in the condition of the petty officers, by increasing their pay and pensions, together with certain immunities not previously granted.

3rd.—Giving long leave of absence to men on paying off their ships.

4th.—The necessity of holding out stronger inducements to merchant seamen to enter the royal navy.

5th.—To re-consider and re-cast the division of prize-money.

6th.—A consideration of that very momentous question, naval punishments.

I firmly believe that these six points encompass the whole question at issue, and therefore we may proceed to consider them in the order in which they stand,—premising that they have been all more or less approached and touched upon, but with a step so faltering and a hand so sparing, and parsimonious, that, instead of the benefits which might have been expected from a bold and generous act, the result in many cases has proved to be rather the shadow than the substantial benefit that was intended. Let us now then proceed with

No. 1.—A progressive improvement in the condition of the seaman by an increase of his pay in proportion to his length of service,

That very important question, viz., what are the best means of inducing men to enter for continuous service, in my humble opinion has not yet been placed on a satisfactory foundation. It may be very true that a great point would be gained if men could be induced to enter for ten years, and if, when once entered, we could keep them to their engagements.

That continuous service is of the utmost importance no one can deny; but I must insist that we can only hope to succeed in securing it by offering the seaman far greater advantages than the small addition of pay now in force.

It is true that thousands of fine young men have entered the royal navy for continuous service. But what has been the result? Why, that in hundreds of cases these men have turned out useless, and the service has been glad to get rid of them. Again, on the other hand, that as many more—aye, and men too who had become good and valuable seamen—were as glad to get rid of the service, and for this very natural reason—because they knew full well that having become efficient seamen there was a ready market for them at higher wages in our large mercantile fleet.

It is stated that from the time the continuous service system was first introduced in 1853 the number of men entered has been 16,220, a large portion of whom have since been discharged;—nearly 3,000 it is said were discharged in the course of the last year of 1857, including many valuable men who were only too happy to avail themselves of the offer.

Can it be supposed that these men, who had already served three or four years, would have forsaken the service of their country if on the completion of five years servitude their wages had been increased £5 per annum, that is to say from £28 17s. 11d. to £33 17s. 11d.; and if they had been told, further, that at the end of the second five years, or after ten years of servitude, their wages would again be increased by another £5 a year—making then £38 17s. 11d.,—provided their conduct was good? I confidently believe that they would not have done so. No doubt the answer to this will be that their pay, indeed, would have been increased had they remained in the service, and accompanied, too, with a good conduct badge! Increased, indeed! and to what? Why, after *five years* servitude an additional *penny a day*, or £1 10s. 5d. a year, and after *ten years* by *two pence a day*, or £3 0s. 10d. a year, and after *fifteen years* servitude by *three pence a day*, or £4 11s. 3d. a year!

I would earnestly ask the people of this maritime nation whether that poor addition of pay, so dribbled out in fifteen years, is really a sufficient inducement for seamen to remain in the service of Her Majesty? The answer from the men themselves is too plain. Their absence shows that it is abundantly proved to be insufficient.

Nor is this all, for before a man becomes entitled to claim even this small advance of wages, he must produce a certificate of conduct endorsed "very good." Clause No. 2 in the Admiralty Circular 284

says, "The good conduct badges have been granted to men bearing only the character of 'good' on their certificates, no person being entitled to them unless with 'very good' character."

How many of these certificates marked "very good" could a captain honestly issue? I am afraid very few! It is clear, therefore, that a commanding officer must often stifle his conscience in order to do justice to a protracted length of fair service, or deprive many a valuable man of a reward he has fairly earned. "Very good" should rather be considered as synonymous with "exemplary," and therefore should be cautiously as well as honestly awarded, and should imply the recommendation of being promoted to be petty officer. What can "good" mean otherwise than "good?" So far should the recommendation "good" be from depriving the good man of his increase of pay for long service, that every man should be entitled to receive it whose certificate was not branded with the character of "indifferent" or "bad," for I think it must be conceded that the only equitable view of the question is this, that no man should be deprived of his just rights unless they were forfeited by *bad conduct*.

The foregoing proposed increase of pay as years of servitude increase should not be considered too great. We must not be startled by the apparently large amount here proposed, and for this reason, because it is *long service pay!* Surely it is far wiser to pay for services really performed than to offer large bounties (so strongly recommended by many high authorities) to men, a large number of whom would never fulfil their contract.

But we must come to this,—stave the question off as long as we may! If we ever intend to insure a certain and constant supply of efficient men for our fleet we must pay for them, and that liberally. The next point is

No. 2.—An improvement in the condition of the petty officers by an increase of pay and pension, together with certain immunities not previously granted.

The Admiralty has fairly considered and greatly improved the condition of this valuable class, not only by establishing a superior grade, called "chief petty officers," but by awarding an increase of pay and pension to the class generally.

I need not allude to this portion of our subject, therefore, further than by stating that in order to be consistent with the increase I propose for long service pay, due provision must be made that that increase is extended to the pay of the petty officer; otherwise we should find that the wages of a first class petty officer would be £2 7s. 11d. less than that of an able seaman after ten years continuous service.

I would therefore suggest that an addition of five, three, and two pounds a year to the highest rate of wages of an A.B. would be a fair and acceptable increase to his pay. Under this arrangement, the annual pay of the respective classes of petty officers would stand thus, viz.:—

	Present Pay. £ s. d.	*Proposed Pay.* £ s. d.
First class petty officers	36 10 0	..... 43 17 11
Second class petty officers ...	33 9 2	..... 41 17 11
Leading seamen.....	31 18 9	..... 40 18 9

It will be seen that I have not taken into consideration the pay of the chief petty officer, which is now £41 17s. 0d., but I submit that in dealing with so valuable a man the utmost liberality, consistent with prudence, would have a most beneficial effect.

I cannot, however, part with this branch of our subject without expressing a doubt of the effect of withdrawing the pension from the warrant officer's widow. I feel convinced that as long as this order remains in force the "prestige" of the petty officer will be damaged,—an officer who should be encouraged by every feasible and legitimate means to look up to the highest position (in a general sense) open to him in the service. There must be something radically wrong when good and steady men are found to view with apathy the only step which can raise them from the condition of the man to that of the officer; and there is much weight in the argument that they are better off by retiring with the pension of a petty officer at an age when they can employ themselves remuneratively, and thus make a provision for their families, than be raised to a position which necessarily brings with it additional expenditure to support, thus swallowing up the whole of their pay; a position, also, be it remembered, which precludes the wife and children of an officer from labouring in many ways which otherwise they consistently could do; "for sailors, though they have their jokes, can love and feel like other folks." Thus, in the end, nothing but beggary awaits the poor widow and her family if her husband dies! Surely, then, it is both expedient and just that the pension of the warrant officer's widow should be restored to her.

No. 3.—We may pass over No 3,—giving long leave of absence to men on paying off their ships,—as this recommendation has been most considerately carried out.

No. 4.—The necessity of holding out stronger inducements to merchant seamen to enter the royal navy.

The experience of ten years has not lessened my conviction that it is much to be lamented that greater inducements than those at present offered are not held out to merchant seamen to join the navy. The opinion is I believe becoming general that our principal supply of valuable seamen will always be found in the mercantile marine, and sooner or later the fact will prove itself that the closer the connection can be drawn between it and the royal navy, the more certain will be the supply; and the more valuable for the interest of the State will the fusion of these services become.

The late Manning Committee and each successive Board of Admiralty seem to have been more or less impressed with this fact, and some minor attempts have been made to test the principle, but they have been by far too unimportant to produce a favourable result.

There is, however, a recommendation which I ventured to make in the paper you have already published, that I must beg to be allowed to repeat here. It is that volunteers into the royal navy from the merchant service should be allowed to count time actually served in merchant ships, in the proportion of two years for one, towards servitude for a pension,—but under certain restrictions. These restrictions might be such as that time so allowed is not to reckon more than five years from the merchant service, and that the volunteer should have served an apprenticeship to the sea, or be otherwise qualified for the rating of able seaman.

Let me illustrate this by an example:—Suppose a merchant seaman to enter the royal navy even at thirty years of age, having been eleven years at sea after he had attained nineteen years of age. He would then bring five years servitude with him into the royal navy. Thus, at forty-five years of age, if his services had been continuous, he would have served the State fifteen years out of the twenty necessary for securing him a long service pension;—the remaining five years would therefore be allowed to him as an equivalent for his experience and qualification as a seaman. This boon to the merchant seaman, in addition to the advantages he would derive from a progressive increase of pay, which has been already discussed, would, I confidently believe, have a most salutary effect on the minds of such seamen, and always prove to be a powerful incentive to them to join the royal navy. We now come to

No. 5.—To re-consider and re-cast the division of prize-money. By a recent regulation relating to prize-money it will be seen that the necessity of this measure has been acknowledged; and that a new distribution was proclaimed, by which the seaman's and petty-officer's shares have been increased. Notwithstanding, however, what has been done, the whole subject has not been left in a very satisfactory state. It is one, I admit, of great difficulty, and, indeed, I may say, scarcely possible to adjust satisfactorily.

It must be well known to every one conversant with the subject that nothing can be more partial in practice than the accidental advantage which officers and men of the royal navy derive from prize-money,—depending, as it does, not upon the work performed, nor the valour displayed, nor the harassing and dangerous duties incident to war, but really and truly on sheer luck, and circumstances of a purely adventitious nature. I verily believe myself to be within the mark when I say that not one ship in ten is fortunate enough in the course of a war now-a-days to make prize-money. Take, for instance, our late Baltic and Black Sea fleets. Notwithstanding all their trying service, and, on many occasions, the display of great gallantry, very few of them have realized one shilling of prize-money;—while a revenue cruizer in the channel, without any risk whatever, learning that a suspected vessel was off the port, captures her, condemns her, and receives a fabulous amount of prize-money for positively doing nothing! I think it must be acknowledged that this is not a desirable state of things, and must add to the unpopularity of

the royal navy amongst seamen; who, although full of patriotic feeling and gallant daring in the face of an enemy, naturally look forward for some reward for their noble services in the hour of danger. They know full well, and every one else knows it also, that the officer has in time sure promotion and decoration awaiting him—most properly so; and although the medal of "merit" is extended to the seaman, by whom no doubt it is fully appreciated, we cannot for a moment suppose that it has the same value in his eyes as in those of his patrician officer, and therefore has he not a right to expect some other reward? and if so, I think it would be difficult to point to any other than a pecuniary one!

Again, what can be more unsatisfactory than the way this fortuitous question of prize-money works?—a branch of the subject which seems to be yet worthy of some further consideration. Indeed, this may not be inaptly illustrated by the following supposititious case, showing the extraordinary anomaly that exists even by the present law in the distribution of prize-money a case which may occur in different ships as far as their respective officers and men are concerned.

It may be well, however, before we proceed to illustrate this to take a glance at the proclamation itself, which for our purpose may be thus condensed:—One-twentieth part of the whole amount of the proceeds of a prize is awarded to the flag-officers, and one-eighth of the remainder to the captains and commanders. The rest is divided into shares and apportioned to ten classes, as follows:—

1st Class.	Master of the Fleet, &c.	45	shares each.
2nd ,,	Senior Lieutenant (when there is no Commander), Secretary, &c.	35	,, ,,
3rd ,,	Sea Lieutenants, Master, Captain of Marines, &c.	28	,, ,,
4th ,,	Lieutenant Marines, Surgeon, Paymaster, &c.	18	,, ,,
5th ,,	Chief Petty Officers, &c.	10	,, ,,
6th ,,	1st Class Petty Officer, &c.	9	,, ,,
7th ,,	2nd Class Petty Officer, &c.	6	,, ,,
8th ,,	Leading Seamen, A.B.'s, &c.	3	,, ,,
9th ,,	2nd Class Ordinary, 1st Class Boys, &c.	2	,, ,,
10th ,,	2nd Class Boys, &c.	1	,, ,,

Now, the example I propose to take in order to show how the principle of distribution works in two different ships, is that of a third-rate and a sloop of war.

Let us suppose that each ship takes a prize which realizes £20,000,—the amount of prize-money received in each case would be as follows. (I do not pledge myself to the closest accuracy of my figures, but they will be found sufficiently correct for our purpose). Of the £20,000, one-twentieth, or £1,000, is awarded to the flag officer; one-eighth of the remaining £19,000, or £2,375, is assigned to the captain and commander in the third-rate, and to the commander alone in the sloop of war. The remainder, or £16,625, is then to be divided into shares, the number of which in the third-rate would be 2,765, making the value of each share about £6; but in the sloop of war it has only to

be divided into 766 shares, raising the value of each share to something like £21 14s. 0d. Consequently, the amount of prize-money each individual would receive according to his respective class in each ship would be as follows, viz. :—

	In the Third Rate.	*In the Sloop of War,*
1st Class	These two classes are not considered.	
2nd „		
3rd „	£168 0*s.* 0*d.*	£607 12*s.* 0*d.*
4th „	108 0 0	390 12 0
5th „	60 0 0	217 0 0
6th „	54 0 0	195 6 0
7th „	36 0 0	130 4 0
8th „	18 0 0	65 2 0
9th „	12 0 0	43 8 0
10th „	6 0 0	21 14 0

These figures speak for themselves, and clearly enough indicate one strong reason why men should prefer a small ship to a large one.

If here is a case made out against the present system of awarding prize-money, as being most unsatisfactory to officers and men, it becomes a question whether it would not be found expedient to abolish the payment of it altogether. I need not say that it is not without much hesitation that I presume to propose so radical a change in a custom which has endured for ages. But the circumstances on which the whole system is founded, I submit have also radically changed within the last half century. Prize-money in former wars was a more general commodity than now-a-days, and was more equally diffused over the naval service. Seamen were then less free agents than now. They were not then invited, but compelled to enter the royal navy if their services were required. They have now become a more thinking race, and more apt to look to the advantages ofwhich they are certain than to the uncertain emoluments arising from prize-money. This gilded bait, I have reason to believe, is in these days very apt to be lost sight of amongst our sailors; besides which, we live in squeamish times, when ultra-philanthropic notions have crept into our councils as to the justifiableness of subjecting the merchants' goods to the unscrupulous fangs of a royal service!

On the whole, therefore, I believe it would be found a more impartial and generally equitable measure, and therefore one more acceptable to seamen than that at present in force, to do away with prize-money altogether; and to substitute for it an allowance in the shape of a liberal war batta, by which every officer and man in the navy then serving would be proportionally and fairly benefited. It would be the means of removing many heart-burnings in respect of choice of station, and, in fact would be doing that which we are all aiming at, viz., holding out stronger inducements for men to join our fleets at a time when we most want them.

Let us now consider the last point of our subject, which is

No. 6.—A consideration of that very momentous question, naval punishments.

I am far from being indifferent to the responsibility which I have incurred by discussing this delicate subject in a public journal, and I sincerely trust that in my humble but anxious desire to promote the happiness of the seaman, and to suggest the means of attaching him to our noble service, I may not fall into the commission of any serious indiscretion. At the same time I would earnestly entreat all my brother officers who may turn their attention to a full consideration of this most momentous subject, that they will divest their minds of the established prejudice of early custom, and calmly and dispassionately think of—not what will be the amount of authority they may lose,—but really what are the most effectual means of ensuring the discipline necessary for the proper command of their ships,—with the least possible shock to the improved habits and the increased susceptibilities of seamen, and also the best mode of encouraging that moral progress, which distinguishes the seaman of our times from him of days long gone by.

It is in vain for us to ignore the fact,—for it must be evident to all observers,—that the sympathies of the nation are adverse to corporal punishment, and are becoming as strong against it as they were against capital punishment under the old administration of our penal laws. It will be well for us therefore to be wise in time, and to try if we cannot mitigate to a considerable degree in the British navy the infliction of this degrading penalty.

It can scarcely be denied that British seamen do not now-a-days look with that apathy which they did formerly on corporal punishment. The old and disgusting clap-trap of "standing it like a man," and making a kind of bargain with themselves to receive a certain number of lashes for a certain amount of intoxicating gratification, has passed away,—and happily so. In former days the question was, not who had been flogged, but who had not! That question we must all rejoice to see is now reversed. This punishment, with all its degrading effect, which was formerly thought so little of, has now become the dread of every well-conditioned man, and I verily believe it is this dread of it more than any one thing else that keeps the merchant seaman out of the royal navy. Few men now-a-days undergo corporal punishment without the crushing conviction that they are debased by it, and therefore become more callous to its repetition, and, of a consequence less scrupulous in the commission of those crimes which lead to it. Notwithstanding, however, the prevailing antipathy to corporal punishment, I for one, at least, cannot yield to the argument that it can be safely dispensed with entirely in the royal navy. I am of opinion that the power to award it should still be retained by our commanders; but I would by every means consistent with the due safety and a proper regard for strict discipline, not only protect the seaman as far as possible from this means of demoralizing him, but also our commanding-officers from the ill effects of their own immediate impulse, in the fervent hope and belief that by so doing the recourse to it would become much less frequent in the service than, unfortunately, is the case at present.

It is well known that corporal punishment cannot be inflicted now without a formal investigation of the offence; a trial, indeed, with the accused and his accuser face to face, terminating in the construction of a warrant; nor can this warrant be carried into effect until a certain interval of time has elapsed: neither can it be executed in any of our home ports without the sanction, by endorsement, of the Commander-in-Chief. This I believe to be a most salutary check, and one that we ought to be very grateful for, as at once securing us from the dangerous impulses of our nature and relieving us from the responsibility of inflicting, perhaps with undue severity in a hasty moment, a harsh sentence. So wise and beneficial as well as merciful do I consider this law to be that I would humbly suggest the expediency of extending its operation to ships at sea! By so doing, the power would still remain with the captain of trying a man for misconduct, and, if he considered that the nature of the case deserved it, to complete a warrant awarding him corporal punishment. But the warrant should not be carried into effect until the Commander-in-Chief or the senior officer had examined the case and confirmed the sentence.

Now, by adopting this measure, no power is taken from the captain which he at present holds; it is merely a postponement of the punishment,—a delay in its execution that might produce this most desirable and beneficial effect, viz., that of giving many a delinquent an opportunity, by contrition and subsequent good conduct, of mitigating the sentence which hangs over him!

Surely, every kind-hearted man and every good officer would rejoice at such a result! How many of us, in every condition of life, would gladly have the time and opportunity to repent and reform, and so avoid the penalty that awaits us for our misdoings? On the other hand, should a man thus situated prove himself, in the interval of the construction and execution of the warrant, unworthy of mercy by his subsequent conduct and misbehaviour, then let the law take its course, and I verily believe in such exceptionable cases not an officer or man in the service—nor a civilian out of it—would be found to hold up his hand against the infliction of corporal punishment.

The object of all punishment is allowed to be not so much to avenge the act as to reform the culprit,—to impress on the minds of other men placed under our command that in awarding the penalty of crime, the award does not proceed from a revengeful and cruel spirit, but from a desire to perform that solemn duty which we owe to our country,—to uphold good order—the want of which must subvert the discipline of our ships, overturn all command, and in the end lead to the inevitable destruction of the British navy.

With respect to secondary punishments, they form a question of serious importance as affecting the popularity of the royal navy among seamen. In justice it must be acknowledged that a considerable improvement has already taken place of late years, the result, no doubt, not only of the highly commendable recommendations of the late Manning Committee; but also the earnest determination on the part of the Admiralty to soften the character of secondary

punishments, and mitigate their mischievous and irritating effects. With a strong hand and a judicious head many a grievance has been removed, and the licence of many a thoughtless commander has been happily curbed. What has been already done in this way justifies the expectation that the good work will proceed to the utmost verge of prudence. But let us hope no further:—for beyond all doubt it requires a cautious head and a mature judgment so to deal with this difficult question as not to paralyze the hands of our commanders by a mischievous interference in the internal regulation and discipline of their ships. Be it remembered that it is far easier from a morbid sensibility, or to gain a fleeting popularity, to loosen the reins of order, than it is to tighten them again, when it is found at the expense of discipline that a false step has been injudiciously made.

Having now considered as concisely as I could the six different points of the subject which I proposed to discuss, I cannot close my remarks without a brief reference to two points of scarcely less importance that have not as yet been touched on. I refer to the present organization of our Naval Recruiting Service,—and to the probable result of a system of rotation duty between naval service afloat and the reserve service on shore.

The naval recruiting service I firmly believe to be in a very inefficient state, and requiring a careful revision, with the view to enlarge and considerably increase the basis of its operations. It would probably be attended with a good effect if that service assumed a more prominent and important character; and was placed under the control of a central board, consisting of two or more energetic and experienced officers, selected from the royal navy and the mercantile marine, neither is it very apparent why the same encouragement for exertion in the shape of some pecuniary remuneration should not be granted to petty officers of the royal navy on bringing up and passing volunteers for the navy, as is at present allowed for recruits to the non-commissioned officers of the Queen's army as well as the militia.

On the second point, viz., the question of rotation duty, I must say that I yet see no reason to change my opinion of its expediency that I ventured to offer ten years ago.

I am fully aware that the question was referred to the Manning Committee in 1853, and that the principle which it involved was ruled against, at least as far as had reference to the Coast Guard. But I am also aware that the same Committee dissented also from the proposal to transfer the control of that valuable corps from the Customs to the Admiralty!

Entertaining as I do great respect for each member of that Committee, and the utmost deference for them as a body, still the opinions of those who formed it, as expressed on both of these points, have not been confirmed by subsequent experience.

Firstly.—The Coast Guard has been brought under the entire control of the Admiralty, with, I believe, the greatest possible advantage to the country; and,

Secondly.—When the men of this service were withdrawn for a

considerable time to assist in manning the Baltic Fleet, extra men were employed to supply their places in considerable numbers without any apparent mischief to the revenue! Moreover, I learn from the officers themselves that it is quite remarkable how quickly the fresh hands from the navy fall into their new duties in the Coast Guard, and as a general rule prove themselves as efficient as men of longer experience.

I will with your permission in a future number say a few words on the subject of the Reserve Service.

And offering you my best thanks for the honour you have done me by admitting the insertion of this paper in your journal,

I remain, &c.

W. L. Sheringham, *Captain, R.N.*

To the Editor of the Nautical Magazine.

[We are always glad to open the pages of this work to forward the good cause of progressive improvement,—whether in hydrography,—in protecting our fleets from lightning,—or in contributing to man them with choice and happy crews,—or indeed in any other good cause,—for who should not delight in doing good. And we shall be glad to find that the excellent suggestions (as they appear to us) of our experienced and esteemed friend and correspondent do obtain that attention from the Royal Commission to which their importance entitles them.—Ed.]

Navies of Foreign Powers.

It is always interesting to trace the development of the naval force of different countries; but at the present time the subject is peculiarly interesting. There is no country in fact that has a small coast line accessible to vessels that does not set to work as soon as possible to form a navy. It is acknowledged all the world over that a navy is a condition vitally essential to safety,—an opinion that is even stronger among nations of a lower order than among the first. But we will proceed to figures, from which our readers may draw their own conclusions.

The navy of the *United States*, by the last returns, was composed of—*Sail*, line-of-battle ships, 10,—of which, one of 120 guns, one of 80 guns, and eight of 84 guns; thirteen frigates, of which, one is of 56 guns, and twelve of 50 guns; sloops, nineteen, of which seven are of 22 guns, eight are of 20 guns, and four of 16 guns; three brigs, of which two are of 6 guns, and one of 4 guns; and one schooner of 4 guns.

Screw steamers:—Seven first class ships, carrying in all 210 guns; one second class of 13 guns; two of third class, mounting together 19 guns. Paddle steamers:—Three of first class, mounting in all 34 guns; one of second class of 6 guns; five of third class, mounting together 20 guns; three tenders and six transports, mounting 17 guns. Total, 74 ships and 2,244 guns.

These 74 ships employ 75 captains, 97 commanders, and 327 lieutenants. Marines 1,100, commanded by 13 captains, 19 first lieutenants, and 20 second lieutenants.

Several commodores command on foreign stations; the Atlantic by Commodore Paulding, Brazils by Commodore Powers, the Pacific by M. Irvine, the Mediterranean by M. Brewer, African coast by M. T. Crabbe, East Indies by Commodore Armstrong. Brigadier General Henderson is the Director General of the Navy, and M. Foncey Secretary.

The Russian Navy is formed into four divisions. The first is in the Baltic, under the orders of Admiral Schantz; the second in the White Sea, under the orders of Vice-Admiral Miskov; the third, under the orders of Vice-Admiral Schichmanoff, is in the Pacific, and the fourth in the Black Sea, under Vice-Admiral Wukotisch.

The first division is formed by a ship of 120 guns, five of 84 guns, three steam frigates, three frigates (sail) of 60 guns, and two corvettes of 10 guns.

The second division consists of five ships of 84 guns, one of 74 guns, and eight frigates.

These two divisions (the Baltic and White Sea) contain together twenty-eight ships with 1,236 guns.

The third division is composed of one ship of 100 guns, four of 84 guns, two of 75 guns, one of 74 guns, five frigates, two steamers, and three transports.

The fourth division consists of paper.

The whole Russian Navy consists of forty-six ships with 1,896 guns, besides a considerable number of gunboats and small craft.

The Russian Admiralty is composed of the Grand Duke Constantine, Admirals Menchikoff, Robsakoff, and Sutko, and Vice-Admirals Meslin, Heyden, and Pujatine.

The Austrian Navy boasts one ship of the line of 100 guns, five frigates, carrying together 165 guns, three steam screw frigates, carrying 129 guns, five corvettes amounting to 74 guns, two steam screw corvettes with 44 guns, four steam paddle corvettes with 25 guns, eight mail steamers carrying together 23 guns, seven brigs of 16 guns each, fifty-two gunboats, mounting together 174 guns, one bomb-vessel of 10 guns, twelve vessels of an inferior description, carrying 94 guns, and nine transports.

This force consists of 109 ships and 950 guns, exclusive of five floating batteries for the defence of ports.

The personnel of the Austrian Navy consists of 2 vice-admirals, 3 rear-admirals, 9 captains, 13 commanders, 57 lieutenants, 46 mas-

ters, and 83 cadets. The Admiralty consists of the Archduke Maximilian, assisted by Rear-Admirals de Fantz, de Sepsi-Martonos, and de Baumberg.

The Prussian Navy has fifty-five ships and 265 guns. The largest of these are two frigates (sail) of 43 guns each; the others are, a steam corvette (screw) and one (sail) of 28 guns together, two frigates (steam) carrying 21 guns, and thirty gunboats carrying 72 guns. These vessels have 112 officers and 3,500 men.

The Admiralty is directed by the President of the Ministry and Admiral Prince Adalbert of Prussia, the Commander-in-Chief. The principal naval station is at Dantzic, under the command of Rear-Admiral Schrœder.

The Dutch Navy consists of 82 vessels, carrying 1,760 guns, and 58 gunboats with 174 guns. In the above 82 are comprised five ships of the line of 74 to 84 guns, sixteen frigates of 28 to 54 guns, ten corvettes of 12 to 19 guns, eight brigs of 12 to 18 guns, besides a number of smaller vessels.

The personnel consists of one admiral, two vice-admirals, four rear-admirals, 20 captains, 30 commanders, 284 lieutenants, 164 cadets, and 5,845 seamen.

The affairs of the navy are directed by a council formed of the Admiral of the Fleet, Prince Frederick; the Commander-in-Chief, Prince Henry; the Vice-Admirals Ferguson and Bouricius, and Rear-Admirals Jolly, Byl de Vroe, l'Hooft, and Smidt van den Broecke.

The Spanish Navy consists of 51 sailing vessels and 42 steam, making together 93 vessels, amounting to 5,230 tons, 1,200 guns, and 9,787 horse-power; besides 118 smaller vessels of an inferior force, 10 in reserve, 70 employed in the service of the ports, 3 as packets, and 8 in mission. The largest vessels are, three ships of the line of 84 and 86 guns; fourteen frigates, of which four are steam of 360 horse-power; five corvettes, and eleven brigantines.

The personnel comprises 1,105 officers of all ranks, and 1,400 marines. Juan da Salomon is the chief of the department of the navy; Pedro de Palacio and Carlos de Aguilera, sub-chiefs of sections; Francois Amero de Peneranda is the Commander-in-Chief of the Fleet; Manoel de Guesada commands the squadron of the Havana, and Antonio de Osorio that of the Philippines.

The Portuguese Navy has 33 sail of ships and 6 steamers, carrying in all 362 guns and 2,181 men. The largest of these is a ship of 80 guns; next a frigate of 50 guns; three corvettes of 18 guns; two brigs of 18 guns; three of 16 guns, and three of 14 guns; eleven schooners and other small craft, mounting in all 45 guns; nine transports, mounting together 9 guns, and six steamers mounting together 26 guns.

This fleet is commanded by a vice-admiral, a rear-admiral, 4 commodores, 10 captains, 20 commanders, and 180 lieutenants. It is directed by the Minister of Marine and Colonies, Sa de Bandeira, assisted by Antonio de Pierre de Carvalho as Secretary, and Antonio J. de Oliveira Lima. Admiral Sir Charles Napier, since 1833, has

been an honorary Admiral of the Portuguese Navy, which he commanded effectively against Rear-Admiral Alves.

The Navy of the Two Sicilies is 98 ships, representing 6,650 horse-power and 832 guns. These include thirty-two steamers, of which two are frigates of 12 guns and 450 horse-power; twelve others of 6 guns and 300 horse-power: the rest are from 40 to 240 horse-power. The sailing vessels are, two ships of the line, one of 80 guns and one of 90 guns; five frigates, i.e., two of 64 guns, one of 48 guns, and two of 41 guns; two corvettes, one of 14 guns, another of 22 guns; five brigantines of 20 guns each; two schooners of 14 guns each; ten mortar-vessels, ten gunboats of 2 guns each, and thirty armed each with a Paixhans gun.

The personnel is composed of 2 vice-admirals, 5 rear-admirals, 9 commodores, 8 captains, 17 commanders, 30 lieutenants, and 26 masters. The vice-admirals are the Count d'Agulla and Jean della Spina; the rear-admirals are, Garofalo, Palma, Cavalcanti, Lettiere, and Roberte. The vice-admirals direct affairs.

It appears from the foregoing that the navies of the Secondary Powers are formed after the models of the principal ones; in fact, that the old fashion of sails and guns of small calibre give place to steam and heavy armaments.—*Moniteur de la Flotte.*

TIDAL PHENOMENON,—*with Tremora, or Tremor of the Earth.*

As the undulations of the tidal column, on the 5th of June, created considerable sensation on this coast, I have noted down for the pages of the *Nautical* such information as my official position here (with regard to our tidal guage) enables me to furnish.

The last six months have been remarkable for atmospheric influences on the tides. February 1st, March 4th, May 19th, were very remarkable disturbances, apparently originating in suddenly shifting winds and stormy weather. On the 5th of June, however there was a remarkable exception to these causes, with some difference in the effect. The vertical rise in this latter instance appeared to be accompanied by a lateral propulsion, so rapid that the shrimpers in Pegwell Bay had a narrow escape for their lives! The progress of this phenomenon may be thus described.

At sunrise the morning was clear and brilliant. It had been calm for several days with highly electric atmosphere; and at 6h. a.m. light airs from North-West prevailed. At this time a dark haze rose from the South-East, and electric clouds rapidly formed and began their swift advance against the direction of the wind. In an hour they had approached the zenith, and all to the Southward was a dark canopy of cloud!

At 8h. a.m. the whole visible atmosphere was shrouded; and at

8.30 a.m. it was much darker than in a total eclipse of the sun, and the rain began to descend in one broad sheet, such as is seldom witnessed in these latitudes. The light breeze veered about continually. The lightning was not severe. The thunder was deep, subdued, and in very prolonged peals! At this time my attention was called to a singular crackling strange noise about the partitions of the room. The mantle-piece and the windows, which cou'd not be affected by a gentle breeze then blowing upon the rear of the house; and it was at this time, 8.45 a.m., that the undulations of the tidal column commenced, and I distinctly recognized the tremor of the earth, which I had described in the pages of the *Nautical* on a former occasion*. Hail fell for a short time, but not sufficiently heavy to break thin glass in exposed sky-lights. The clouds (at a little before 9h. a.m.) began to open in the South-west, and the electric storm passed gradually onward to the North, and by 10h. a.m. we had a tranquil summer atmosphere.

After the storm had cleared away, my attention was called to the number of panes broken in our clock-house windows (an isolated building in the pier yard.) These squares of glass were not forced outward or inward, but were reduced into sharp angular flaws, all the pieces of which remained in their position. These window frames are of cast iron, those in my house are of soft wood, and it seems probable that the harder frames not yielding to the lateral tremor, caused the glass they enclosed to fly, while the softer material tended to neutralise the effects upon so brittle a material.

I remain, &c.,

K. B. MARTIN, *Harbour Master.*

Royal Harbour, Ramsgate, June 10th, 1858.

To the Editor of the Nautical Magazine.

THE LATE CAPTAIN SAMUEL ASHMORE.

Sydney, New South Wales, April 2nd, 1858.

Sir,—I trust no apology will be necessary for enclosing a paragraph respecting an old master in the merchant service, and one who has contributed in former years and until a recent period to the columns of your valuable publication. I hope a corner may be found in the *Nautical* to dedicate to his memory, for sure I am no worthier name will be recorded there. In this sentiment, bold as it may seem, I shall be, I know, borne out by all who knew him, and, amongst nautical men especially, that will include a very large number.

In the vigour of youth he devoted himself very ardently to all that could aid in the increase and dissemination of nautical knowledge;

* See vol. for 1850.

and until within the last few years, when his mental and bodily powers became impaired, he lost no opportunity of furthering the same objects.

The rapid advance in position and acquirements which has been made by master mariners within the last few years has been the means of producing many such men in the present day, but those who know what this class, as a body, were even twenty years ago must feel that such men as Horsburgh and Ashmore, contemporaries and personal friends as they were, were far in advance of the age in which they lived.

Still, we cannot help feeling that, with a few honourable exceptions, the merchant service does not contribute so much to hydrography as it might do.

Formerly, the bulk of merchant ships were navigated in such a manner—trusting for longitude, in the majority of cases, to dead reckoning solely—that positions of reported dangers, &c., could never be depended on. Now, the reverse is the case, and if each would but contribute his mite, how small soever it may be, I feel assured, especially in comparatively unknown seas like that which washes these shores, a very large stock of valuable information could be collected.

The writer of this has been favoured with a place in your columns —On Erroneous Charts, number for May, 1856,—and feels still strongly on the same subject.

I would wish to call attention to a shoal marked in some of the recent charts nearly abreast of Twofold Bay, and called Maria Theresa Shoal. Having had a long experience on the coast I knew no such danger could exist in that position, and after much search in the Sydney records, I have discovered that a ship of the above name reported in Sydney some years ago a shoal in the same latitude and longitude as to *figures*, but the latter *West* instead of East. Hence the mistake, which, to my own knowledge, has caused anxiety to some shipmasters in passing the locality, which might have been avoided by more care on the part of chart compilers.

This blunder leads me to draw attention to the probability which exists of the propagation of similar ones. The meridian of 180° passing through an ocean studded with islands and ever-increasing coral reefs, it follows that the misplacing a letter only—E for W, or the reverse—is not easily detected, and the difficulty of course increases the nearer that meridian is approached. I have often thought that as typographical errors of this sort will occur, even under the most careful management, and may be productive of very serious results, that it would be better, in the notice of any new discovery, &c., to use no figures, but print the degrees, minutes, and seconds in words at full length. The importance of the subject should be a sufficient excuse for the extra trouble. So with North, South, East, and West. Even this might not be sufficient at all times; and, possibly, notwithstanding its apparent cumbrousness, it might be advisable to reckon, through the Pacific at least, continuously from East

to West all across it. I merely throw out the hint,—no doubt your great experience will suggest some remedy.

I foresee another jumble before many years from our present reckoning. The localities East and West of the antipodeal meridian have a different day—the Sunday of one being the Monday of the other; and as these islands become peopled by Europeans, as they undoubtedly will be, confusion from this cause must arise. How is best to avoid it?

I must apologise for the length of this communication. I only intended at first to solicit a place for my dear departed friend's name in your obituary, but have unwittingly spun a long yarn.

The enclosed bottle paper I stumbled over in my search through the Sydney *Shipping Gazette* for the shoal before mentioned. If you have not seen it it may be of service in the compilation of a southern bottle chart.

I am, &c.,

HENRY T. FOX.

To the Editor of the Nautical Magazine.

THE LATE CAPTAIN SAMUEL ASHMORE.—We sincerely regret having to record the death of a very old colonist, Captain Samuel Ashmore, which took place on the morning of the 31st March. He was born at Dublin on the 5th day of August, 1787, and was consequently in his 71st year. For more than fifty years he was connected with the maritime interests of this colony. He commanded a vessel through Torres Straits to India very early in the present century, and his remarks and observations in that then but little known and much feared passage were of the utmost service to succeeding navigators; in fact, Horsburgh's charts of the latest date indicate discoveries made by this excellent navigator, the positions of which have always been found strictly correct. As a friend of the world-renowned Horsburgh, he contributed largely and valuably to the charts and works of that hydrographer, having had a long experience in the Indian seas, more especially about Sumatra, Java, and the Dutch East Indies generally.

Captain Ashmore was an indefatigable and accurate observer of all which pertained to his profession, and omitted no opportunity of making new discoveries in unknown or little frequented localities, or of correctly ascertaining and establishing the position of dangers previously doubtful, so far as these duties could be performed compatibly with the service in which he was engaged.

Since Captain Ashmore retired from the sea he has been principally employed as marine surveyor in this port, for the last twenty years in the service of the Australian General Assurance Company; by which company he was so highly esteemed that on his resignation last July, in consequence of ill health, he was awarded a very handsome pension for the remainder of his life; but, unfortunately, he has not been permitted to enjoy this fruit of his labours very long.

As a tribute to his memory, the flags of all the ships in harbour,

foreign consuls, &c., were hoisted half-mast as soon as his death became known; and so widely spread is his reputation, and so general the respect in which he was held by all who knew him, that we feel there are few ports in the world this brief notice will reach, where some mariner will not be found to whom the announcement will cause a feeling of sorrow and regret. The funeral will take place this afternoon at three o'clock, when, we doubt not, the remains will be followed to their last resting-place by the masters of vessels in port and a large number of his private and personal friends resident in Sydney.

Sydney Empire, April 1st.

[We thank our correspondent for his letter and for enabling us to express the high estimation in which we held his late friend Captain Ashmore, whose useful assistance we had missed for some time among those communications of his brother seamen which it has always been the pride of the *Nautical* to encourage.—ED.]

BOTTLE PAPER.—"No. 8. On board the ship *Ambarawa*, Captain J. P. Karst. Sailed June 15th, 1845, from Amsterdam, bound to Batavia. Noon, August 20th (Wednesday), 1845; lat. 38° 31 S., long. 27° 36′ E. of Greenwich by *medium* of two chronometers.—

"J. K. HASSKARL, *Botanist of the Government Gardens at Baitensory, Island of Java.*"

This document was found by some native blacks on May 1st, 1851, about ten miles West of Cape Bridgwater, which lies in lat. 38° 24′ S., long. 141° 25′ E.

P.S.—April 5th.—Since the above letter was written, the accompanying extract from a New Zealand paper has been republished here. I trust it may be considered of sufficient interest to be retained, the more so as such evidences of the currents in that locality must be very few.

OCEAN CURRENTS.—Mr. Editor, I enclose a copy of a note that I found sealed in a bottle at sea on the 16th of December, 1857, in lat. 39° 50′ S., long. 36° 35′ E. Please to give it an insertion in your valuable paper, and oblige yours, very respectfully,

J. MADISON WILLIAMS,
Commander of the ship Gideon Howland.
Mongonui, New Zealand, 9th March, 1858.

The following is a true copy:—"Ship *Ocean Chief*, from Melbourne to Liverpool, 1st January, 1857, lat. 42° 40′ S., long. 42° 32′ W. All well. Thirty days out.

T. J. TOBIN, *Commander.*"

The bottle is computed to have made a distance of 3,586 miles.

New Zealander.

Nautical Notices.

Particulars of Lights Recently Established.

(Continued from p. 330.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
38. Cantick Hd., Orkneys	58° 47·2′ N., 3° 7·7′ W.	Hog Island	R.	115	16	Est. 15th July, '58. Period of darkness not stated. *(a).*
39. Lobos Island	35° 1·5′ S., 54°52·5′W.	R. La Plata	F.	84	14	Est. 5th April, '58. *A fixed white and red light* is stated. *(b).*
Light Vessel	35° 6′ S., 55° 54′ W.	English Bk.	F.		11	Est. 5th April, '58.
40. Cape Borda	35° 45·5′ S., 136° 34·5′ E.	Kangaroo Is. N.W. Pt.	R.	510	30	Est. about 1st May, '58. Showing alternately red and white lights at half minute intervals.
41. Pensacola	30° 19′ N., 87°17·4′W.	Florida	R.	210	21	Est. 1st Nov., '58. Old light to be then discontinued.
Sand Island	30° 11·3′ N., 88° 2′ W.	Mobile Bay	F.	152	19	Est. 1st Nov., '58. The revolving light on Mobile Point (eastern at entrance) then will become a *fixed* light.
42 Gran d'Algues Mortes		Gulf Lyons	F.		3	Est. 15th July, '58. Red. Harbour light. S.W. of present light 295 yards.

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

(a).—A flash is stated as taking place once a minute. As a "revolving light" implies a light increasing to and decreasing from a strong glare, followed by an interval of darkness, it would have been as well to have given the duration of this interval. If there is no darkness, it then becomes a fixed light, varied by a flash or flashes, or perhaps a glare, but it is not a "revolving light."

(b).—The seaman must make as much of this as he can; but the authorities at Monte Video might have been a little more explicit in their description.

We learn from an authority on which we can depend that the lights supposed to be at La Guayra, Santa Martha, and at the Roques do not exist. The light at La Guayra was destroyed in 1848 and not renewed.

Cape Rizzuto light, the light at Port Cotrona, in Calabria, and that at Andrea Island, off Galipoli, are also said to be discontinued.

Note.—American lighthouses on the *Florida* Reefs will be distinguished by the American flag after 1st July, 1858.

Pacific.—We find the following relating to the cruise of the *Morning Star* in a Sandwich Island paper. An account of the cruise of this vessel will appear in our next.

While coming up through the Ralick Chain, we discovered a small island not laid down on any of our charts. Landed on the West side and counted twenty-three inhabitants. The island was named "Anderson Island," after Dr. Anderson of Boston. On her return, the

Morning Star encountered easterly winds, which forced her as high as 36° N. Arrived at Honolulu, January 28th, thirty-six days from Covel Island.

Capt. Moore has also noticed several errors in the existing charts. The following islands, laid down in some charts as doubtful, do not exist.

St. Bartholomew Island, lat. 15° 25′ N., long. 164° E.

Kabahala Island, lat. 10° 5′ N., long. 166° 45′ E.

Wilson Island, lat. 19°. N., long. 166° 45′ E.

Neither of the above reported islands exists, as the *Morning Star* sailed over the positions laid down.

Supplies at Japan.—*Hakodadi.*

The following from the *New York Journal of Commerce*, containing a Japanese letter addressed to the American Consul at Hakodadi, will no less interest many of our readers in the subject of supplies to be obtained at Hakodadi as well as the character of that fine harbour, and its commerce.

Sir,—You have said that your countrymen, without eating fresh beef after a long sea voyage, become sick, and their lives are in danger. From this necessary reason I have asked permission from the government at Jeddo to deliver bullocks to you, and have received the following order:—In Japan, from ancient time, bullocks were only used as beasts of burden and for trade; but from this time they shall be fattened in a village near Hakodadi and ready to deliver when you shall ask for them.

At no other port in Japan will bullocks be delivered but Hakodadi. This you will understand and make known to all your people.

Moeragari Arradsjinhames,
Governor of Hakodadi.

To E. C. Rice, United States Commercial Agent for Hakodadi, October 1st, 1857.

Also all kinds of vegetables, Irish potatoes, chickens, salmon, and, in fact, almost every thing that can be got in the New York market can now be had here. The people are very friendly, and show a willingness to furnish everything they have to all American ships, and are very desirous to have them come here.

The Mexican dollar is now worth ninety-four cents (94), gold only twenty-two cents for the dollar (22). The only articles of export of any amount are soy, &c.; therefore trade to any amount with this country will never be done, and the principal benefit to us will be this port as a depot for supplies and repairs for our American whaling fleet that yearly comes to these waters. For this purpose there is no place better adapted. The harbour is not surpassed in the world, and

capable of safe anchorage for five hundred ships, with all facilities that can be asked for supplies and repairs. It is also well adapted as a depot for the line of steamers from San Francisco to China, a large supply of the best kind of coal for steam ships having recently been discovered some sixty (60) miles North of this port, which will be furnished at a reasonable price.

From January next Americans can permanently reside here, (both men and women,) and as the Amoor River is now being opened for steam navigation for hundreds of miles through that vast and fertile country, and this being the only safe harbour for the whole region, this will from necessity be to that noble river what New Orleans is to the Mississippi.

There are now five extensive establishments at Nickleoskie, on the Amoor River, which are visited yearly by sailing vessels; but owing to the shallowness of the water the navigation is slow and very difficult; but this will be remedied by steamboats similar to those on the Mississippi, and ships that bring merchandise for that region can readily obtain return cargoes of oil, &c., at this port. The climate at this port being not so warm in summer nor so cold in winter as New York, oil can be stored to much better advantage than at Honolulu.

I am informed that a strong effort is being made to have the naval depot now at Hong Kong changed to this port; if done it would tend greatly to the health of the squadron and would be a saving to Uncle Sam of many thousands of dollars that are now annually thrown away.

Atmospheric Influence on Chronometers.

Notwithstanding the numerous modern improvements successively introduced into the chronometer, the results of which in their combined effect have been to place that invaluable aid to the navigator in certain cases within fair limits of perfection, there still remained an evil to which it was liable, and which would gradually derange the performance of any chronometer, however excellent it might be, and this too as if by stealth, unknown even to the most careful person by whom it might be employed. There are chronometers produced by our first makers, which at the Royal Observatory have performed for a whole year with wonderful accuracy, keeping almost mean time throughout even that long interval, and going with that uniform steadiness under considerable changes of temperature that have placed the names of their makers at the head of their profession. Still, even these chronometers, when at sea, although very superior to others, have not been able to preserve the high fame which they had acquired.

The source of this serious evil has been no secret, and the first who ventured to combat it was the late Mr. Mudge, who placed two of his chronometers each in vacuum, and thus excluded the ill effects of the damp and saline influence of the atmosphere as well as other deleterious particles of matter to which it was unavoidably subject in a ship at sea. The effect, we have been informed was an uniformly good performance to the end of the voyage,—the result of protecting the most delicate and vulnerable parts of the works from being assailed by the particles abovementioned. The balance-

spring itself was thus preserved from these particles of saline matter, which it is well ascertained corrode the metal and affect the elasticity of the whole spring, and thence the performance of the chronometer. Now the contrivance of Mr. Mudge might have been costly or troublesome: at all events we have never heard that it has ever been reproduced, and the old evil of damp remained with all its inconvenience. The only modern attempt to neutralize its effects that we know of, was by the late Mr. Dent, who fortified his balance-springs with a covering of gold by the galvanic process; but even this, we conclude, by being abandoned, was not entirely successful. At length, however, there seems to be good reason for considering the evil to be overcome by Mr. Johnson, chronometer maker of the Strand, by simply enclosing the chronometer in a brass case, which, to all appearance, seems to be that of the chronometer itself. But it has the great advantage of entirely excluding every possible access of the external atmosphere as closely as that excellent medium gutta percha can make it. A chronometer thus secured in one of Mr. Johnson's cases, is at once proof against all such external cause of derangement. It can be used and wound up as if it had no such protector, and need not be opened from the time it leaves the maker's hands until it returns to them. From our own observation we venture to believe that Mr. Johnson's method of thus protecting the chronometer from sea damp, will prove successful;—it is not an expensive addition to any chronometer, it cannot fail in being beneficial to it, and therefore has important claims to the attention of navigators.

NEW BOOKS.

The demands on our space have been so pressing and heavy of late that they have obliged us to set aside our usual notices of new books, which in consequence have proportionately increased, and now insist on attention. We must therefore proceed at once to consider their claims, commencing with

A TWO YEARS CRUISE *off Tierra del Fuego, the Falkland Islands, Patagonia, and in the River Plate, &c.—By W. Parker Snow, late Commander of the Mission Yacht Allen Gardner, &c.* 2 vols., Longman.

Mr. Snow is not unknown to us, having produced one of the most interesting and comprehensive little volumes of Arctic enterprise among the several works which have appeared on that momentous subject,—one no less useful as containing a general view of the whole question of Arctic discovery, besides valuable hints and good information on ice navigation. In fact, he proved himself to be a close observer, and well knew the importance of recording his observations, even to such particulars as are too commonly omitted by our first navigators.

As the commander of a missionary vessel to Tierra del Fuego, he has produced an account of what he saw and what he did with the same fidelity as that for which his former book is remarkable. He gives a faithful narrative of his proceedings, even to being somewhat prolix (a good fault, too, as it lets the public into useful information respecting the Society by which he was employed); he takes the vessel to the Falkland Islands, selects a station for the centre of their operations, visits the forbidding shores of Tierra del Fuego, finds the remains of that unhappy victim of infatuation, Capt. Allen Gardner, and his companions, of whom he gives a most interesting history,—falls in with the celebrated Jemmy Button and all his relatives,—makes several useful

voyages to Monte Video rather than let his vessel lie idle waiting for directions from home, and in the course of all these proceedings notes down a mass of information which will render his work a standard reference on the Falklands and Atlantic shores of Tierra del Fuego.

Mr. Snow is not only a close observer, as his book shows him to be, but as a commander a humane and most considerate man in his station, punctilious in business, thoroughly alive to his employer's interest, and every inch a sailor. As we perused his narrative, observing his management, and feeling for the roughs to which he was subject, besides the difficulties of his station, we could not help thinking that the Patagonian Missionary Society were fortunate in finding so excellent a servant. Indeed we were about to congratulate them on their good fortune, when, alas for the Bristol Society and its friends and contributors, the conclusion of Mr. Snow's narrative induces us to offer him instead our sincere congratulations on having closed all connection with a Society in whose service the horrors of Capt. Gardner's party occurred, and from which his own treatment seems to have been quite of secondary consideration. Mr. Snow has made some plain assertions which the friends and contributors to the missionary labours in Tierra del Fuego would do well to look into.

MY FIRST VOYAGE:—*a Book for Youth. By William Stones.*

A busy mind will find work, whether at sea or on shore; and like either of the talents of different orders with which the race of man is endowed, will distinguish the individual as surely as that other word which is by some sages defined as "the root of all evil." And well is it that so it should be, they serve to declare the man in his intercourse with the world; one makes while the other mars his fortunes.

As on shore, so at sea, subjects for employment abound. Indeed more so, perhaps, on the watery plain than on shore; for a variety of pursuits not suggested here, present themselves there, and there, too, the arts and sciences flourish in some way; which way, if not so remarkable for perfection as it is on shore, is at least as useful: for what after all is a ship? Nothing but a travelling town or village, sometimes fortified it is true, but oftener not so, where every one is thrown on his own resources, and where, as on shore, the man who has a mind will find abundance of employment. To this class the author of the little volume before us evidently belongs. Every thing before him presents subject for inquiry. While the commonest things of the ship, their application and use, are made the subject of remark, their history becomes the subject of investigation. When these principles are applied even to some limited portion of the numerous materials found in a ship,—to subjects suggested by the early discoverers in maritime geography,—to even a hundredth part of those presented by natural history, of which the ocean is no less a prodigal field than the land, and when to these are added those inquiries of a philosophical character to account for the principles and materials by which our meteorological instruments are constructed, the field of inquiry into which a person who has a mind can rush without the aid of a microscope, is at once boundless and inexhaustible, affording materials for as many books, aye, and abounding in interesting tales of the wonderful and yet simple ways of nature, as would fill hundreds of such volumes as this before us.

With a very laudable intention, the author of this little work "for youth" has pointed out to the juvenile mind how the steps of inquiry may be directed in to some of the numerous branches of science to be found under the different heads to which we have alluded. He has illustrated his book with views and charts, and although we might wish that he had adopted that more familiar and attractive style which has so much effect on young minds (for it is not

after all a story book which a first voyage might have been), it may be very justly considered a valuable little work for more than juvenile voyagers between England and her antipodes.

THE NORTH-WEST PASSAGE *and the Plans for the Search for Sir John Franklin. A Review.—By John Brown, F.R.G.S., &c.* London, Stanford, 1858.

Will something about the frozen pole cool the heated system in these early dog-days? Imagination goes far, it is said, but one effect of such reflections as the volume before us is likely to produce is to raise an additional glow arising from the feeling that all our efforts to discover a N.W. passage have ended, after a few miles of geographical discovery, in the utter loss of our countrymen, with the two ships which contained them. There is something, after all, humiliating in this reflection, and sufficient to give the advocates of the "let alone" school a kind of triumph,—men who religiously point to the accessible portions of our globe, and allude with a kind of triumphant air to the dictates of that power which has said "thus far shalt thou go and no further." But man is an inquisitive being,—he has a kind of restless impulse ever at work, always wanting, never satisfied, and frequently that which is most denied him, and in arctic discovery he can and does excuse himself under the pretext of scientific inquiry.

The author of the volume before us has devoted a very large share of time and close attention to his favourite subject. Beginning with the early days of arctic discovery, he has enlarged on it as he advanced, and the proceedings of every arctic navigator, from the first voyage of Ross and Parry, are given with a fidelity that will always render his work a complete epitome of what it assumes to be—"Arctic Discovery." Having provided it, besides, with a good index and a long list of works consulted by him, he has really produced a book which we would cordially recommend to those who are desirous of possessing so complete a history of our attempts at the N.W. passage as it contains in one handy volume. Our author is evidently a man of great perseverance and abundance of energy to produce the work before us at this time of day in arctic history, when the sore of disappointed hope through a series of years is yet festering, and we are turning our thoughts now and then to a single vessel absent yet in search without a spark of expectation that any good will arise from it,—to produce, as we say, such a volume as this, and to recommend the subject to be again taken up on public grounds, shows an amount of energy and perseverance which very few men besides our author do possess. It is a kind of hardihood in a cause which can see nothing beyond it, placing it paramount to every other, as it no doubt is in the author's estimation.

Of course the supposed position of Franklin's ships when locked in the ice is designated on the chart accompanying the work before us—that beautiful little chart which our readers will remember illustrated our own "Reflections" on the subject in the *Nautical;* and it is no little satisfaction to us to find that we are pretty nearly agreed with the author as to his position, although others (among whom is Mr. Arrowsmith himself) consider that Franklin went really up the Wellington Channel. But of all this enough has been written and said. Whether he did go up that channel or not may remain for the exercise of opinion. We searched for him there and he was not found, but we never searched where we should have done, where he might have been found, and where we might even have combined our efforts, if they had been properly directed, with our favourite pursuit, geographical discovery. But the same fatality attended that unhappy expedition throughout until its sacrifice was complete. Let us, therefore, await the result of Captain M'Clintock's

enterprise, which might happily throw a ray of light on the manner and the place in which the long dreary years of Franklin's absence were passed; but to think of more searching expeditions to follow each other would be what has already been recommended to an arctic committee by a high authority now passed away, and yet with how much effect? Arctic enterprise is now at rest in the page of history, and Mr. Brown's is a capital epitome of it.

SEA DRIFT. *By Rear-Admiral Hercules Robinson.* Pitman, London, 1858.

Such is the quaint title of a small volume of some 250 pages by one of our Blue Jackets, an officer of the Nelson school, "every inch a sailor," and as good a specimen of the literate British seaman as ever stepped the quarter-deck. Admiral Robinson is not unknown to the readers of the *Nautical.* His summer cruises on the coasts of Newfoundland and Labrador will yet be fresh in the memory of our readers; his entertaining and lively descriptions of persons and places; his trite remarks on our fishing regulations, and his entertainment of French officers, along with all his *jeux d'esprits* in their proper places, and his admiration! of the sailing qualities of his ship, with a hundred and more other things which he knows well how to weave into a few captivating pages, to win the admiration of the young if they do not interest (as they are well calculated to do) the curiosity of his elder brother officers. The treasure hunt, too, that nautical romance, was touched on in our pages; but here we have it forming the object of a yacht cruise for the summer, one if not productive of gold, at least, as he says, well calculated for a healthy recreation. And, as usual, the occasion lends wings to the imagination. A journal of a cruize, and with such an object, to an isolated rock in the ocean, on the sunny side of the "Fortunate Islands," if it did not add to the fortune of the Admiral at least gave him occasion for abundance of remarks and observations, all duly registered as "Sea Drift." As a true British sailor, even the improvement of our charts is one of his objects, and therefore those abominations called *rigiæ* fall under his remarks in the usual course of business, as our readers will perceive by an extract we have made in a former page of this number,—one that will convey a tolerable idea of the rambling, discursive nature of the Admiral's pen. For such matter as he has produced with abundant anecdotes of men like Nelson, Collingwood, and many more of their day, the Admiral could not have found a better *sobriquet*, and although the book men may miss certain stipulated ceremonies in their line, rendered imperative by the all powerful force of habit, the man of experience will see in its pages abundant proof of that happy mode of treating any thing and every thing in his way in such a manner as to induce the desire that the Admiral will not long let it remain idle, for we sadly want a naval author! Marryat has left a gap which has not yet been filled up.

THE STORM COMPASS—*in a Spanish garb.*

A recent number of the *Moniteur de la Flotte* concludes a review of several works of a nautical character with the following commendatory words. "We shall conclude by recommending also another book of M. Lobo:—'LA AGUJA DE LAS TORMENTAS,' (le Compas de Ouragans). It is a translation of that published in England by M. Becher, Capitaine de Vaisseau." The shorter the better, there is nothing like brevity,—a principle is nothing but a principle after all, and the fewer the pages expended in teaching it, as well as illustrating it, as long as they are effectual—the fewer we say the better. And such was our object in the Storm Compass, although to suit certain ends pages on pages have been produced on what might go into a nutshell! We

are glad to see our pains appreciated by our Spanish friends. The "*Aguja de las Tormentas*," is a proof that our work is appreciated, and certain we are that our view of the subject was right that a pencil or a piece of chalk was all that was wanting to find the direction in which lay the focus of a hurricane, all tables and other paraphernalia being superfluous, and the head the proper reference instead of such supernumerary matters,—of which we have abundant proof in letters from Redfield, Reid, and officers in command, who know the value of our little "Storm Compass."

A TREATISE ON THE LAW *relating to Sea Lights and the Rule of the Road at Sea, &c. &c. By F. T. Pratt, D.C.L.*

"From what can we reason but from what we know," has been long ago said by one of our first poets, and the words have passed to a maxim as applicable in law as in other walks of science. Precedent indeed is the rule with the long robe, as is very well known, and therefore it has been the object of Dr. Pratt to collect a tolerably extensive list of decisions of collision cases to which ready access is afforded by an index. The work opens with the importance and use of lights in sea-going vessels, gives the Rules laid down by the Admiralty, and then cites a great variety of cases of collision with the decisions given upon each of them. The foregoing is sufficient to show the value and importance of the work, which cannot fail to become a reference and guide for future decisions, and those who are deeply concerned in such matters, whether owners, commanders, or whoever they may be, would do well to study it and learn their responsibilities.

STEAM NAVIGATION.—A Parliamentary paper shows that there has been an astonishing development of steam navigation during the last few years. Thus, the number of steamers engaged in the home trade—the coasts of the United Kingdom or parts between the limits of the Elbe and Brest—has advanced from 312 in 1849 (with a tonnage of 54,089 tons and 4,442 men employed) to 388 in 1857 (with a tonnage of 92,481 tons and 6,462 men employed); the number engaged partly in the home and partly in the foreign trade has increased from 20 in 1849 (with a tonnage of 5,539 tons and 262 men employed) to 66 in 1857 (with a tonnage of 20,859 tons and 1,200 men employed); and the number engaged in the foreign trade from 82 in 1849 (with a tonnage of 48,693 tons and 3,742 men employed) to 445 in 1857 (with a tonnage of 268,023 tons and 17,291 men employed). The general increase has been from 414 steamers, with a tonnage of 108,321 tons, employed in 1849, to 899 steamers, with a tonnage of 381,363 tons employed in 1857.

The total number of steamers built and registered in the United Kingdom between 1843 and 1857 was no less than 1,805, and the number built in one year advanced from 46 in 1843 to 228 in 1857. The average tonnage of those built was 133 tons in 1843 and 232 tons in 1857. The proportion of steamers built to sailing vessels was in 1843 7·05 per cent., and in 1857 21·71 per cent.; and the tonnage of the latter has not increased in the same ratio as that of steamers, the average being 118 tons in 1843, and 188 tons in 1857. The more rapid increase of steamers as compared with ordinary ships may be further illustrated by the following comparative statement of the total number of vessels employed in the home and foreign trade in 1849, 1853, and 1857:—1849, 17,807 sailing vessels and 414 steamers; 1853, 17,567 sailing vessels and 639 steamers; 1857, 18,429 sailing vessels and 899 steamers. From this it will be seen that while the increase of sailing vessels employed has been

only 3·49 per cent., that of steamers has been 117·15 per cent., and the proportion of steamers to sailing vessels has advanced from 2·22 per cent. in 1849 to 4·87 per cent. in 1857. The 18,429 sailing vessels employed in 1857 had an average complement of 8·21 hands; the 809 steamers an average complement of 27·75 hands. The average tonnage of the sailing vessels employed in 1857 was 207·83 tons, that of the steamers 424·20 tons. So much for the extension of steam navigation.

RECOVERY OF THE FRENCH SHIP "CŒLI REGINA."—In consequence of information received in Monrovia, Commander Croft left in the *Ethiope* on the 14th of April, and on the 15th fell in with the French ship *Cœli Regina*, 420 tons, in the possession of a large number of negroes, who were not able to manage her. After a parley, the second officer of the *Ethiope*, with part of the crew, went on board, when about 250 of the negroes swam to the shore, where nearly the whole were murdered by the captain of the French ship and natives. It appears that the *Cœli Regina*, which is completely fitted for the slave trade, had been cruising for a month near Cape Palmas, and under pretence of taking them to a better place, had secured 500 negroes, who were immediately placed between decks, many of them in irons. When Captain Simon was ashore at Manna, on the coast of Liberia, and part of his crew in a boat alongside, the negroes procured firearms, and shot all but the doctor and two of the seamen, whom they retained to steer the ship. Captain Simon came within gunshot several times afterwards, but was not allowed to come on board. The *Cœli Regina* was towed into Monrovia, where she was left in possession of the purser of the *Ethiope*.

Board of Trade, Whitehall, June 10th.

The Committee of Privy Council for Trade have received a copy of a note from the Russian Minister at this Court, relative to an imperial decree establishing a new system for the measurement of vessels in Russia, which is given below, and stating that the rule will be applied henceforth to all Russian vessels without exception; but that with regard to foreign vessels, the method will only be applied in case the masters are unable to produce either a document establishing their right to hoist the colours, or ship's papers, known in Russia under the denomination of "Titres de propriété du bâtiment," which documents should certify the number of lasts measured by the ship to which they belong.

Russian Method of Determining the Tonnage or Lastage of Ships.

1. Measure in English feet:—*a*. The *length* of the upper deck from the back of the stem to the front of the sternpost. *b*. The *breadth* inside of the under surface of the planking of the same deck, taken amidships; and *c* The *depth* in the ship's well over the keel from the deck planks to the limber boards.

2. Multiply the three preceding dimensions into one another—that is to say, length, breadth, and depth—and divide the product by 130; the quotient will give the capacity of the ship in tons; and by dividing this quotient by 2, the capacity in lasts will be obtained.

3. If there is a poop on the upper deck, or a light deck above the quarter deck, they must in each case be measured, the *length* inside, the *breadth* amidships, and the *height* between the planks of the decks.

Multiply these three dimensions into one another, divide the product by 00, and then divide the quotient by 2; the quotient after the last division must be added to the measurement previously obtained, and the sum total will give the whole capacity of the ship in lasts.

4. Steam-vessels are to be measured in the same manner as sailing-vessels, but a deduction is to be made from their capacity of three fourths (¾) of a last for each nominal horse-power of the engine.

Naval Chronicle.

[In consequence of the importance which naval movements are assuming we resume our former register of these transactions, trusting that our monthly record will be more complete in our next.]

Lord Lyons, in *Royal Albert*, with *Conqueror*, *Princess Royal*, and *Centurion*, left Malta on the 10th June for three days' cruise to exercise gunnery.

Urgent (s.) left Malta for England June 11th.

Penelope (s.) arrived at St. Helena from Simons Bay on 3rd May.

Vulture arrived at Alexandria May 23rd from Malta.

Curlew arrived at Alicante June 6th from Valencia, and left for Gibraltar.

Inflexible, from Galle, arrived at Singapore May 1st.

Calypso sailed from Rio Janeiro for the Pacific Ocean April 14th.

Magicienne left Panama for China May 7th.

Cordelia arrived at Bombay from Kooria Mooria May 10th.

Iris arrived at Sydney (N.S.W.) March 15th, and *Megæra* April 2nd, from Melbourne.

Bloodhound, 3, Lieut.-Comdr. Robson, arrived at Spithead, June 17th, from the West Coast of Africa station. She left Sierra Leone April 19th, Gambia 26th, Teneriffe May 21st, Lisbon June 3rd, Vigo 11th. The *Bloodhound* left Devonport on the 16th of September, 1855, but has been very unfortunate in her captures, as the only one she made (an American vessel) she had to give up again, and was ordered home in consequence.

Hecate, Comdr. G. F. Burgess, arrived at Spithead on 12th June from the West Coast of Africa. Her dates are Ascension, April 28th; Sierra Leone, May 13th; and St. Michael's, June 2nd. She has been sent home on account of her sickly state, having got the coast fever on board, and it being found impossible to clear her of it. She had been at anchor since the 11th off the Isle of Wight, owing to a dense fog in the Channel. Comdr. Gordon (her former commander), Assist.-Surgeon W. J. Butler, and two boatswains have all fallen victims to the fever, and about forty of her crew were sent to hospital at Ascension. She brought twelve invalids from Ascension for Haslar Hospital, who have been taken there. The *Hecate* has taken two prizes of only small value since she has been in commission—the brig *Chatsworth* and the topsail schooner *Niagara*.

Marlborough, 131, Capt. Lord F. Kerr, flag of Vice-Admiral A. Fanshawe, C.B., left Spithead on 15th June, for the Mediterranean.

Vulcan, steam troop-ship, Comdr. J. Seccombe, arrived at Spithead on 16th June from Gibraltar, under canvas, her engines having broken down.

The screw steam-ships *Renown*, 91, Capt. A. Forbes, and *Racoon*, 22, Capt. J. A. Paynter, from Gibraltar, arrived in Plymouth Sound on June 14th. The *Renown* and *Racoon* left Lisbon on May 29th, and arrived on June 5th at Gibraltar, where three sets of orders from Lord Lyons awaited them. The first instructed the ships to proceed up the Mediterranean, the second to remain until the French fleet passed, and the third to return to England if they did pass. They left on the 9th, in compliance with the last order. The French fleet was observed steering out of the straits on the night of the 3rd June, by the steam troop-ship *Urgent*, which happened to be then going in. It is stated to consist of about twelve sail, including three frigates, which were supposed to be bound to Brest.

Lapwing, dispatch gun vessel, Comdr. O'Reilly, left Devonport, on 12th June with sealed orders. An Admiralty messenger arrived by the morning mail train, with despatches, which were at once delivered to Comdr. O'Reilly, and the ship ordered to sea. It is believed the despatches are for the Commander-in-Chief in the West Indies, and have reference to the question of search raised by the Americans.

Monarch, 84, Capt. G. E. Patey, was paid off at Sheerness on 12th June. The following seamen and other persons received medals and gratuities for long and meritorious services, viz.:—John Davis, quartermaster, the medal and £10; John Blake, master-at-arms, medal and £15; William Monogan, gunner's-mate, medal and £15; John Leonard, quartermaster, medal and £15; John Harper, leading seaman, medal and £5; James Perkin, private marines, medal and £5. The following first-class petty officers received gratuities for good conduct, viz.:—Wm. Locket, quartermaster; Wm. Martin, sailmaker; Wm. Thompson, captain of foretop; H. Mitchell, captain's coxswain; J. Trotter, boatswain's mate; and Sergeant Chislett, Royal Marines: £7 each. Second-class petty officers:—Wm. Palmer, armourer; Henry Turl, yeoman of signals; Benjamin Franklin, second captain of foretop; and Corporal Hurrall, Royal Marines: £5 each. Captain Patey, in presenting the medals, and informing the before-named what gratuity they would receive, addressed the ship's company and his officers in a very appropriate manner on their being about to separate, and was listened to by all hands amid the most profound silence. A finer ship's company could not be mustered in the British fleet. Numbers of them expressed themselves willing to volunteer for any ship their captain, commander, or executive officers might be appointed to, and a number expressed their desire to leave the address of their homes should their services be unexpectedly required. Several have volunteered for other ships now fitting at different ports as well as at Sheerness.

Urgent, 6, screw troop-ship, Comdr. J. W. D. M'Donald, arrived at Spithead on 22nd June. She left Malta on the 11th, and Gibraltar on the 17th inst. She reports that the body of the mate (Mr. A. W. L. Browne) belonging to the *Racoon*, who was lost overboard during his watch, had been picked up and buried with the usual honours by the officers and crew of the *Curlew* in the "neutral ground." The *Urgent* brought home troops.

Britannia, 120, sailing ship, has been taken into Portsmouth basin to be brought forward to take the place of the *Illustrious* as a training ship for naval cadets and boys.

Volunteering for the navy continues to go on briskly at Liverpool; on the average between thirty and forty able seamen are forwarded to various naval stations every week.

The Queen has been pleased to direct letters patent to be passed under the Great Seal, appointing the Right. Hon. Charles Philip Earl of Hardwicke, Richard Plantagenet Grenville Nugent Chandos Temple (commonly called Marquis of Chandos), the Right Hon. Edward Cardwell, Vice-Admiral William Fanshawe Martin, Sir James Dalrymple Horn Elphinstone, Bart., Captain John Shepherd, Royal Navy, bearing the rank of Commodore, William Schaw Lindsay, Esq., John Shepherd, Esq., Deputy Master of the Trinity House, and Richard Green, Esq., to be her Majesty's Commissioners to inquire into the best means of manning the Navy.

A commission, consisting of Rear-Admiral Sir Thomas Maitland, C.B., Rear-Admiral George Elliot, C.B., Captain R. H. Hewlett, C.B., of the *Excellent*, Captain Jerningham, of the *Cambridge*, and Commander M'Kenzie, of the *Excellent*, sit daily at the Royal Naval College, Portsmouth, to revise the book of instructions for naval gunnery, and to take into consideration several other important matters connected with the efficiency of the naval service in that and similar branches.

Sayings and Doings.

A steam-frigate named the *Forté* was launched at Deptford on the 29th of May; she was named by Lady Pakington.

The *Leviathan*, it is hoped, will shortly be ready for sea; great efforts are being made to complete her equipments.

The Atlantic Telegraph squadron, consisting of the steamers *Agamemnon*, *Niagara*, *Valorous*, and *Gorgon*, returned to Plymouth Sound on Thursday evening the 10th of June, after an experimental cruise off the Bay of Biscay. The experiments with the cable are said to have been quite satisfactory, and the expedition finally started from Plymouth on the 19th.

At Canton it is said that the new Imperial Commissioner was collecting a numerous army, with the object of attempting the recapture of Canton. Lord Elgin had gone up the Peiho, so that we shall probably soon hear that the Celestial Court has given him an audience and satisfactory assurances, or that all the disposable forces, French and English, have moved northwards for the reduction of Pekin.

The *St. Helena Herald* of the 4th of March, contains an ordinance of the Governor, granting to the Emperor of the French, and his heirs in perpetuity, the lands forming the sites of Longwood and the tomb of Napoleon I. The lands in Napoleon's Vale, where the tomb is situated, comprise about twenty-three acres, while those of Longwood comprise about three acres. They recently belonged to private owners, and have been purchased by the Crown for the purpose of the present transfer at a cost of £1,600 for the tomb and £3,500 for the house.

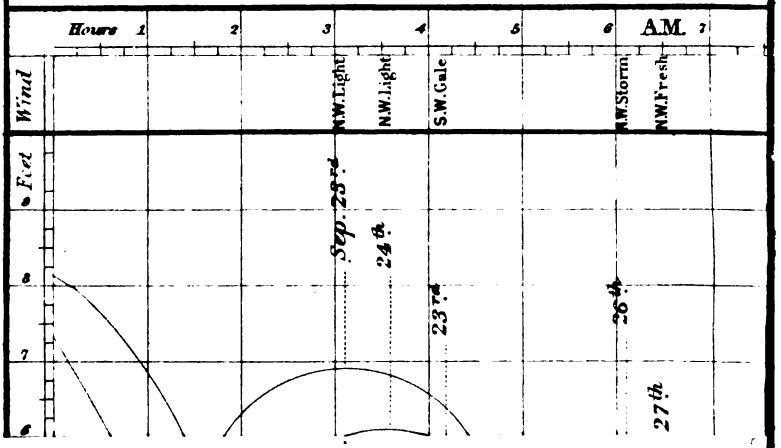
The civil war still rages, it would seem, in San Domingo. The batteries of the principal seaport opened fire on the foreign shipping there, nearly sinking a Sardinian vessel, and inflicting heavy damages on some French and Spanish craft. Of course the republic of San Domingo will have to account for this outrage, and, so far as the French ships are concerned, the reckoning we may be sure will be a severe one.

PEARL FISHERY.—A letter of the 20th (March) states:—"We have had ten days' fishing, and there is about £15,000 already in the chest. There will be ten days more fishing. Oysters sold to-day as high as 25 rupees per thousand."—*Colombo Observer.*

The *Indian Empire* left Galway, with the mails for New York, &c., on June 15th, and the pilots who had charge of that vessel when she ran on the San Marguerite Rock have, we believe, been committed for trial on the charge of maliciously injuring the ship, and under an Act of Parliament which, it would seem, is only in force in Ireland.

The visit of two French men-of-war to the Austrian port of Gravosa, in the Adriatic, has elicited the fact that the Austrian regulations do not permit more than one foreign man-of-war to enter an Austrian port without previous notice, and that foreign men-of-war are entirely excluded from what are denominated War Ports. The affair has led to a correspondence between the French and Austrian Governments.

47. *Diagram Shewing the Time of High and Low*



THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

AUGUST, 1858.

THE EFFECT OF DIFFERENT WINDS ON THE TIDES—*of the Strait of Dover and its Vicinity. By A. B. Martin, F.R.A.S.*

[We commend the following paper to the *close* attention of all commanders of ships that have to navigate the strait of Dover: we mean by "close attention" that they should read and understand it. They will then perceive the reasons for those extraordinary changes in the rise and fall of the tides with their set and velocity which are so frequently fatal to ships when navigating that strait. By attending to the simple directions given by Mr. Martin, they may owe to them not only the safety of their ships, but perhaps that of their lives; for they may be prevented thus from leaving an anchorage in that navigation at a time when they would otherwise do so. Having showed that the cause of these irregularities is the wind, we hope Mr. Martin will not leave the important subject presented by the dangerous navigation in question, and of which he is so completely the master, without illustrating those effects by showing the set and velocity of the tides at flood and ebb at the different periods of the moon. He will thus have contributed a most important benefit on seamen, by making plain to them the sources of danger in one of the most difficult districts of navigation on our coasts,—the strait of Dover,—and prove himself the worthy scion of his excellent parent the well known Harbour-Master of Ramsgate.—ED.]

In the work published by the late Admiral Beechey, entitled "*The Use of the Lead; or, How to Correct the Soundings,*" there is a very clear and concise method of ascertaining the depth of water at any time of tide at any port, or in any position under tidal influence, (or what is usually called pilot's water,) for which port the rise and fall

at spring tides are known. The reverse problem of finding the time of tide by the depth of water may of course be as easily worked by means of his simple and clever diagram. But on considering the practical working of this theory, (true and beautifully simple as it is under all ordinary circumstances,) as applied to certain localities, and in particular to that between the South Foreland and the entrance of the River Thames, and extending into the straits of Dover, in which, from experience, I know that very serious opposite effects are produced by the action of different winds and heavy gales, effects, too, that perplex the navigator, it became evident to me that a concise explanation of the nature and amount of these sometimes sudden and extraordinary changes would be acceptable to the inquiring mariner, whose first object is the safety of his ship, and who would then be prepared to avoid their fatal effects.

It is unfortunately too much the fashion now-a-days for ship-masters to give up the entire charge of the ship to the pilot, when once in "pilot's water," under a feeling, perhaps, akin to "having had enough of her during the voyage;" perhaps, too, from feeling their ignorance of the dangers of the locality; or, more fatal still, from a misplaced confidence in the buoys, beacons, lights, &c., which are now so thickly set upon the face of the water, that they find it as easy to navigate the channels which these buoys, &c., are intended to define, as to take a turn down any well lighted thoroughfare.

But pilots may be mistaken—nay, more—may be incompetent. As a rule, I believe that there are no men in the world who more nobly uphold the character of their profession than they do; and with due care (on the part of the ship-master) to seeing that the man received on board is an accredited pilot, he may be safely entrusted with the charge of the ship. But it is just possible that he may not be what he should be, and then what an increase of confidence the master would have, when feeling that should the pilot fail in his duty, his own knowledge might carry him safely through.

Rationally it may be said that no ship-master can give up the entire charge. The pilot is there to assist him by his local knowledge of the intricate navigation, and his practical experience of the tides; but not to command or take the sole responsibility. In any case, an observant master is better than an unobservant pilot, no matter how long may have been the experience of the latter; and an intelligent master, well acquainted with the pilotage, is a tower of strength by the side of his pilot in any emergency. And this local knowledge should possess great interest to an inquiring mind, as all useful knowledge invariably does. Therefore, since it does not require anything more than a fair share of common sense, and a reasonable amount of attention, I trust to make the subject both clear and interesting while showing its importance to both masters and pilots.

Let us now take a case in point, and suppose that a fleet is at anchor in the Downs, anxiously awaiting a long looked for "*slant* of wind" from the Northward, with which to run down Channel. Is it possible to foretell the coming change by any other indications than

the late one perhaps of flying clouds, &c.? It is, I believe, in some degree. Let the master take Admiral Beechey's simple diagram, or, better still, construct one for himself upon a larger scale, and hang it up by the side of his barometer, in order that he may consult both together. He knows that the vertical rise from low to high water (in the Downs) at spring tides is 16 feet; at neap tides, 10 feet. It is now, we will suppose, "dead low water" with him. He judges the proportionate rise due to the moon's age, and watches the rising tide by his diagram. If he finds it more than it should be as shown by it, and especially if accompanied by that rise in the barometer which, in this latitude, invariably occurs in conjunction with it, then let him stand by, and get all ready for the run down Channel, the wind will certainly veer to the Northward. But if, on the contrary, the rise is sluggish and of little amount, with falling barometer, then there will be danger in that anchorage, open as it is to Southerly gales, for the wind will surely fly round to this quarter. The cause may be remote, but it is approaching, and the tides are the precursors of it; just as in the ocean, the swell predicts the coming storm long before it comes.

Again, take another case,—a sudden shift of wind to a Southerly gale sweeps the ships out of the Downs. Happy the man who is able to pick up his anchor. Away they go round the North Foreland, and hug themselves in fancied security in Margate Roads. The gale abates; but it is only drawing breath. Down it comes with increased fury (as it usually does) from the N.W., having shifted into that quarter; and away go drifting ships fouling one another, or running round the Foreland again to seek safe anchorage; a fine harvest for the "long shore men," who, always wide awake, have foreseen the coming shift of wind, and are quietly waiting for them there in their luggers. Here, again, the rising of the tide in excess, and the indication of the barometer, would have told the observant master that the N.W. gale was coming on, and he would have been prepared for the emergency.

It is a common thing to hear a boatman say, in the very middle, apparently, of a stiff Sou'-Wester, "This won't last, we shall have the wind, in a much heavier storm than this, from the Northward before morning, see how the tide is sluicing along the shore and into the harbour." And so it proves. How many fine ships would be saved if these simple indications were more anxiously watched and attended to.

Another reason why ships are lost, is, too often, that seamen are not what they were; they take no interest in the ship. Entered for the voyage or the run what do they care about her? "What's the use," says growling Jack, "of boxing about from one anchorage to another, taking so much care of her, and giving so much extra work? Let her take her chance!" Many a master, influenced by these grumblers, lets slip the golden opportunity, and away he goes. It is not just, however, to find fault without proposing a remedy, and as the object of the author is to state a few simple facts for the benefit

of mariners in general, we will leave this painful subject. But it is sad to see the amount of wreckage on these dangerous shoals. It is enough to rouse every right minded man to the serious consideration of every means whereby the safety of ships and crews may be increased, if not insured; and, I believe, that nothing will more tend to their security than the intimate knowledge, once acquired, of local peculiarities, combined with firmness in executing what the master knows to be absolutely necessary to that end.

Thus much for the tidal indications of sudden shifts of wind. Let us now examine the effect of winds on the set and drift of the tides themselves; and to do this more effectually, let us take a glance at the annexed tidal diagrams, (traced by the self-registering tide-guage at Ramsgate Harbour,) and let us analyse the records. Before entering upon the conflicting effects produced on the tides, it may not be out of place, however, to take a brief glance at the existing theoretical state of things.

The *Tide and Half Tide* is so well and widely known now, that a very few words will suffice. The meeting of the English Channel and North Sea tides in the narrow part of the Channel from Beachy Head to the North Foreland, produces tidal appearances which are very perplexing at first sight to the mariner. There is an intermediate tide formed which ranges between the abovenamed limits, and opposes or joins the Channel and North Sea tides alternately. At high water at Dover (which is the standard port for the Channel and North Sea) this intermediate tide, which has been running to the Eastward with the Channel flood, instead of turning with the Channel ebb, separates from it and continues running to the Eastward for three hours and a few minutes, then joining the North Sea ebb. It then turns and running to the Westward joins the Channel ebb during the remaining portion of it, and continues running to the Westward (opposing the Channel flood, and being joined by that of the North Sea) for a corresponding three hours and a few minutes;—thus constantly sustaining its easterly or westerly stream for *half a tide* after the grand tides have ceased, and thus gaining the name of Tide and Half Tide. Many fanciful theories have been broached to account for this peculiar condition of things; but with them we have nothing now to do. Simply stating its nature and effects as seen in regular tides and light breezes, I will now proceed at once to the discussion of the tidal diagrams above alluded to, which will show at a glance what enormous errors may be caused in a ship's reckoning by the action of shifting winds upon the tides in this locality.

First, let it be fully understood that the action of the tide in fine weather, and uninfluenced by atmospheric changes, would be as beautifully regular as the oscillations of a pendulum, (to which simple illustration of my subject I shall adhere,) uniformly falling as much below the mean level of the sea as it rises above it; not, however, remaining constant in their rise and fall,—but decreasing in both from springs to neaps, and increasing again from neaps to springs. The truth of this is beautifully illustrated in the annexed tidal diagrams; but with this

qualification, that here the pendulum is not left to itself, but is constantly acted upon in one direction or another by the pressure of some extraneous force, most commonly a shifting sudden gale, but at times by atmospheric electricity.

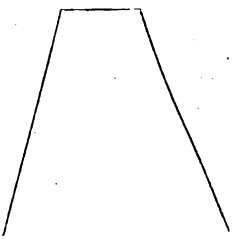
As we shall now refer to the tidal diagrams herewith, it may be as well to explain to the reader how they are obtained. Besides, some may be sceptical as to the accuracy with which a tide-guage may be made to register its own proceedings. We will therefore attempt a little description of ours and its mode of working.

A well is sunk through the solid masonry of the pier, (under the lighthouse upon the West pier head at Ramsgate,) and this well is so protected from the external agitation of the water, that no wave, however powerful, can produce the slightest effect upon the mirror-like surface of the water in it. Upon this surface is a wooden float, which is attached to a chain communicating with a little travelling carriage holding a pencil, which traverses from end to end of a cylinder. This little carriage is connected at its other end by another chain to a balance weight, which is heavy enough to take in all the slack of the chain as the rising tide lifts the float, but is overpowered and drawn back again by the weight of the float as the latter sinks with the level of the falling water.

This would, however, only produce a *fore and aft line* along the cylinder. It will be then asked, "How is that complicated series of curved lines produced?" In the following manner. The cylinder, along which the pencil travels, and round which the skeleton diagram is rolled, and properly adjusted to the hour at which it is fixed there, (as seen by the word *on* in the diagrams,) is connected with a clock, by the operation of which it is turned round its axis with a steady and uniform motion. Now while the cylinder is thus turned by the clock motion, the float is rising or falling with the tide, and therefore the pencil is pulled in one direction or the other, leaving its own marked line of progress on the paper, and by this simple contrivance the tide is thus made to trace its own rise and fall, to show also the line of high and low water, and thence the number of hours it was flowing or ebbing.

If I have not quite made this clear to the reader, let him take any cylindrical body, (a good sized round ruler will do,) and wind a sheet of white paper round it; then, while another person turns it slowly round let him trace a line along it in one direction—lengthways. When he uncoils his paper he will find a *diagonal* line there. If the ruler, or other cylinder, has performed several revolutioons on its axis during the time he has been moving his pencil along it, (provided the motion of the pencil be at one steady rate throughout,) when the paper is removed he will find several *parallel* diagonal lines. Again, if he has moved his pencil at unequal speed, sometimes faster or slower, he will find a series of diagonal lines, but most irregular in their outline. Once more! If at a certain point he remain stationary, the cylinder still revolving in the mean time, a line will be described *perpendicularly* to the axis of rotation; then, if he turn and retrace his

pencil line, a diagonal line will again be produced in the opposite direction; which when removed will appear thus



Now apply this simple explanation to the tide-guage, and it will be seen at once how the curved lines are produced. The float rising or falling acts upon the pencil as the hand in moving it forward or backward, the cylinder revolving equably all the time. If the motion of the pencil be uniform, that is, if the tides be tranquil, as in the first truly beautiful diagram, then a series of curves as nearly parallel as possible is produced. But if the pencil be moved by tides entirely out of their course, as in the latter diagram, (equally beautiful as the former as showing the delicacy of the registry,) then the greatest irregularity will be seen in the curves. They are curves in the diagrams, and not like the figure I have described above, simply because the tide describes a path which is best seen perhaps when compared to something that every seaman watches daily,—I mean the apparent path of the sun,—which rises rapidly until within a short distance of the meridian or highest altitude, then describes an arc almost parallel to the horizon, and finally sinks rapidly on the other side of the meridian. Just so the tide rising rapidly till near high water, then slacking, and finally ebbing rapidly,—describes its path on the diagram.

One more question may be asked,—"How do you get the graduations of the rise and fall in feet and inches—upon the diagram?" That indeed is a simple mechanical problem. It must of course be so graduated that a rise of one foot of the actual tide-guage should produce a line corresponding to one foot of rise on the diagram; that is to say, that the pencil acted on by the float must move through a space considered as one foot on the diagram for every actual foot of rise or fall in the water. This is simple; and once attained by experiment, the slightest excess or deficiency in rise or fall must produce corresponding results on the diagram. It is a simple and beautiful instrument, and its records, as I trust I have shown, are admirably adapted for the practical demonstration of the effects of atmospheric phenomenon on the tides.*

The diagram No. 1 consists of a series of summer tides recorded in June, 1846, when everything was favourable to their regularity; yet even here it will be perceived that the highest tide did not occur until the 13th June (four days after full moon), or one day later than usual—and why? The wind, light as it was, had shifted from South to N.E.; it removed the pressure of the ærial column from the opposing direction and, transferring it to the other, aided the rising tide. Nothing can be more beautifully clear than the record thus made by the "finger of the tide." So sensitive is the guage that in many of

* The self-registering tide-guage employed by the Admiralty is made by Newman, of Regent Street, London.

the beautiful diagrams which it has been my pleasing task and my privilege to inspect, the smallest tremor of the water caused by passing thunderstorms or other exciting electrical causes is instantly communicated to the pencil and distinctly traced by it upon the paper.

It is generally believed that a higher rise produces a lower ebb, and so it would naturally from neaps to springs, but, on the contrary, from springs to neaps the rise and fall mutually decrease. So that at springs we have high floods, low ebbs; at neaps, diminished floods and ebbs: this would be the natural action and reaction of the tidal pendulum. But in the case of a high tide produced by any unusual pressure the pendulum would be thus acted upon. If that pressure (suppose it to be a sudden storm) were removed as suddenly as it came and succeeded by a calm, the tides would return gradually to their former regularity,—as any other pendulum when struck requires a few vibrations in either direction before it regains its equilibrium. If when the tide is at its highest the pressure were reversed, that is, if the wind veered suddenly to the opposite quarter, probably the fall would be as much below as the rise was above the mean level, provided the pressure were equally violent. But if the gale still continue steadily blowing from the same quarter, the falling water would be upheld and thrown completely out of course.

It would swell this essay to an inconvenient size were I to insert all the perfect diagrams which tend to prove this interesting and important point. I have one before me now in which a neap tide rises six feet above its ordinary level at high water, while the succeeding low water is only eight inches below the mean level of the sea. The stream of ebb was so completely checked that the Gull light-vessel did not swing upon tide, but rode as if upon a stream of flood the whole low water. Upon another occasion, I see by a diagram a very high spring tide, caused by a heavy, sudden shift of wind to the N.E., resulting in the loss of the brig *Shepherdess;* and yet again (and, alas, how many, many more might be cited) a similar case in the loss of the brig *Mary White.*

The circumstances attending the latter most painful occurrence are so graphically narrated by the zealous Harbour Master at Ramsgate, in the April number of the *Nautical Magazine* for the year 1851, that I cannot do better than quote his account of it. He says, "The man who said he was at the helm gave me the following account:—'The captain was well acquainted with the pilotage, and the mate also knew the coast well. They had passed most satisfactorily and correctly all the buoys and channels during the day, and the lights also when darkness set in; more especially after the gale came on from the North, they sighted and passed the Galloper and Knock light-vessels, made the North Foreland, and shaped their course for the Gull Stream. The captain was on deck. The man at the helm remarked to him, "The vessel seems to go to leeward of her course." He replied, "Keep her a point more to windward." They did so, and shortly afterwards the helmsman again observed, "Sir, we seem to be nearing those breakers under our lee very fast," and the captain

replied, "Down helm and sail her close." But it was too late! The sea was terrific! To tack was impossible! To anchor in time equally so! To wear there was no room! And when driving into the breakers the captain exclaimed, "Oh, Good God, the tide has deceived me. I have not allowed enough for the tide."' Had the ship held her luff she would have gone clear, but the northerly gales caused the off tide to set athwart the shoal with increased velocity, instead of along it or astream." The Harbour Master, whose experience and observation of the tides in that locality have indeed been of long standing, and carried on with untiring zeal for years, continues, "Now, I believe he had allowed enough for ordinary tides, but this was one completely out of course." The preceding high tide had been four feet above its proper level, and therefore the returning body of water would naturally set out with tremendously increased velocity and momentum right athwart these dangerous shoals, deceiving the most careful mariner unless he was fully acquainted with the nature of the "cause and effect" resulting in these perplexing and, too often, fatal fluctuations of the tides.

(To be completed in our next.)

THE CHANNEL OF EURIPO.—*Coasts of Greece.*

[With the view of contributing to the illustration of the following account of the channel of Euripo, which we find in a recent *Moniteur de la Flotte*, we commend to the reader's notice the beautiful chart of the Talanta Channel published by the Admiralty,* and have borrowed from Mr. Murray's *Handbook of Greece* some account of the adjacent parts,—in which useful little volume, however, the present works at Euripo have not yet found their place.—ED.]

The island of Eubœa and its chief town were in the middle ages called Egripa. But this is a manifest corruption, and as every place of importance has now resumed by law its ancient name, we have discarded the modern appellations of Negropont and Egripo, and have restored to the island its classical name of Eubœa and to the town that of Chalcis. The island was considered one of the most important possessions of Venice in the prosperity of that powerful republic; and one of the memorials of its former greatness displayed to this day at St. Mark's is the standard of the kingdom of Negropont. The capital town for many years after its reduction by Mahomet II. was the usual residence and under the immediate command of the Capitan Pacha, the High Admiral of the Turkish fleets. At the present day, Chalcis is the only place in the kingdom of Greece where a few Ma-

* No. 1554*b* of catalogue, and to be had of Mr. Potter, 31, Poultry.

hommedan families still remain. One mosque has been reserved for their use; the rest have been converted into churches. The fortifications here, as elsewhere in Greece, are ruinous; but there are some tolerable houses in the town.

The lion of St. Mark remains over the gate of the castle of Chalcis. Many of the best houses are of Venetian construction, and a church with high pointed roof, square towers, and Gothic windows, was also probably built by that people, who possessed the place for nearly three centuries before its capture by Mahomet II. in 1470. An enormous piece of ordnance like those of the Dardanelles that defends the approach to the south side of the castle, is the most remarkable Turkish monument. The fortress is a construction of different ages, the square towers erected before the invention of gunpowder being mixed with Venetian bastions of antique construction, and with Turkish white-washed walls. In the glacis of the castle was the Turkish burial ground, beyond which is the town, surrounded by walls in a dreadful state of dilapidation, encircling the promontory in a semicircular form from bay to bay. The Turks threw up beyond these a palisaded rampart of earth across the isthmus.

The only remains of ancient Chalcis consist of fragments of white marble in the walls of the churches and houses. Chalcis has been a place of importance from the earliest times. It is said to have been founded by an Ionic colony from Athens, but it sent out many colonies of its own. In later times it was generally dependant on Athens.

The bay on the North side of Chalcis is called St. Minas, that on the South, Vurko, from its shallow and murky nature; this latter bay communicates, by a narrow opening, with a long winding strait, extending four miles to a second narrow opening, where, on a low point of the Eubœan coast, is a tower on the plain of Vasiliko. No vessels except boats can approach Eubœa on the South side nearer than this tower. On the North there is no difficulty in approaching. The Euripus, which is properly the narrowest part of the strait between Mount Karababa and the castle of Chalcis, is divided into two unequal parts by a small square castle on a rock, with a solid round tower at the N.W. angle. The stone bridge from the Bœotian shore, sixty or seventy feet long, extends to this castle; while a wooden bridge, thirty-five feet long, communicates from this castle to the gate of the fortress. With respect to the castle on the rock, the round tower is Venetian, the rest of Turkish construction.

The first bridge over the Euripus was constructed in the twenty-first year of the Peloponesian war. During the expedition of Alexander the Great into Asia, the Chalcidenses fortified the bridge with towers, a wall, and gates, and enclosed a place on the Bœotian side, called Canethus, within the circuit of their city, thus obtaining a fortified bridge head. Canethus was probably the hill of Karababa. The bridge no longer existed 140 years after, during the campaign of the Romans against Antiochus, B.C. 192, but it was again thrown over the Euripus at the time when P. Emilius Paulus passed that way, after the conquest of Macedonia, twenty-five years subsequently. In

the reign of Justinian the bridge was so much neglected that there was only an occasional communication of wooden planks. It is under this bridge that the extraordinary changes of current take place which are frequently mentioned by ancient writers, and have puzzled all modern savans. The average depth of the water is seven or eight feet; at times the current runs at the rate of eight miles an hour, with a fall under the bridge of about a foot and a half. It remains but a short time in a quiescent state, changing its direction in a few minutes and often several times in the course of every twenty-four hours. After changing its course, the stream almost immediately resumes its velocity, which is generally four or five miles an hour either way. These phenomena have lately been noted during an observation of three months, but there are no sufficient data for reducing them to regularity.

In the plain near Chalcis are three ancient excavated cisterns of the usual spheroidal shape. In one of them appears a descent of steps, with an arched passage cut through the rock into the body of the cistern, which is small and not deep. It is now converted into the church of St. John Prodromas and has a screen and altar of rough stones. The two other cisterns seem also to have been churches, as they bear the names of two saints, but they are choked with rubbish. Further South are the ruins of an aqueduct on arches, which supplied Chalcis in the Roman times. North of the city, the plain and a cultivated slope extend along the foot of the mountains as far as Politika, four hours, a village near the sea. A little beyond begin the great cliffs which are so conspicuous from many parts of Bœotia, and which rise abruptly from the sea for many miles. South of Chalcis, half way between it and the tower before-mentioned, is a round hill on the shore, called Kalogheritza, which commands a good view of the Euripus and the Eubœan firth as far North as Lipso, and South to a cape beyond Kalomo. Immediately opposite to it are the bay of Vathy or larger port of Aulis, and the smaller port separated from the first by a rocky peninsula. On the top of Kalogheritza are two ruined towers, perhaps windmills, and near them some Hellenic foundations, and an ancient column on the ground. Inland, the height falls to a plain, which connects that of Chalcis with the larger one of Vasiliko, which extends South nearly to the ruins of Eretria. Towards the sea the hill consists entirely of rock, in which many sepulchral crypts have been excavated, and stairs and niches have been cut. A copious stream issues from the foot of the rock, and a paved road leads along the shore to the plain of Vasiliko. Possibly this hill may have been the site of Letantum; the plain behind it being exactly interposed between those of Chalcis and Eretria must have been that which was an object of such deadly contention between the two states that a pillar still existed in the time of Strabo in a temple of Diana Amaryzia, seven stadia from Eretria, on which was an inscription declaring that no missiles should be used in the war. The plain of Letantum is mentioned in the Hymn of Apollo as famed for its vineyards; and the plain behind Kalogheritza produces vines in such abundance, that a

village in the midst of them is called Ampelia. It was only in the most populous and opulent times that Eretria could maintain a rivalship with Chalcis. Under the successors of Alexander, when Greece became impoverished, the peculiar advantages of Chalcis gave it the superiority which Strabo remarked, and an increase of the same causes has ended in making Chalcis the only town of magnitude in Eubœa. But the consequence of the opposite fate of Chalcis and Eretria is, that at Chalcis hardly any vestiges of antiquity remain, and Eretria, by means of desolation, has preserved sufficient remains to confirm the former importance of the city. The Eretrians were carried into captivity by the Persians in B.C. 490, just before the battle of Marathon; and probably the state never recovered the loss of its chief citizens on that occasion.

The village of Nea Eretria is on the site of the New Eretria, built a little in the South of the ancient city.

Eubœa is now, as formerly, valuable on account of the extraordinary fertility of its soil, and the quantity of corn with which, under favourable circumstances, it supplies the adjacent country. Twenty for one is mentioned as the common return of grain. The chief produce of the island, however, is wine; Vallonea, cotton, wood, pitch, and turpentine are exported, but in small quantities. The timber would be very valuable were there sufficient means of exporting it.

The principal places in Eubœa are, besides Chalcis, Carystas, Kumi, and Xorochon. Carysta is at the South, and Kumi at the East extremity of the island. The traveller must be prepared for worse roads, poorer people, and consequently worse accommodation than in the more frequented parts of Greece. The great want of population (which is more scanty here than in other parts of Greece) prevents the more extensive cultivation of this most fertile and once richest district, and other foreigners have of late years purchased estates here, and are gradually improving the agriculture and the state of the people.

According to the accounts of the country people, the northerly winds haul to the eastward generally in the evening. The navigation from Karystos to Bourgi becomes easy, especially after passing Kavaliani. At Bourgi a vessel finds before her a winding pass of half a cable across and seven cables long, bounded on the left by land nearly awash with the surface water and on the right by a bank not marked by buoys, which extends for three cables S.W. from the tower. It should not be attempted but with a fair wind, especially as the current, which generally runs at the rate of one knot and a half, may acquire a rate of three or four knots and, influenced by the wind, will render the navigation difficult. The anchorage off Bourgi is most safe against foul winds; from whence vessels may avail themselves of the first fair wind, which, considering the short distance, should enable them to clear the second pass and carry them to Chalcis.

To pass Bourgi a vessel should make early for the West coast, and

continue along it at the distance of a cable's length for a mile and a half, as far as the turning, hauling gradually to port, increasing her distance, to avoid Sunk Rock, so as to pass near the islet opposite to Salpi Bay. When this island bears South (true) the vessel should steer for the point S.W. of Edana, passing along it pretty close; whence she will reach the second pass, the North shore of which she should take, but should not pass too near the point of Vourke Bay. This second pass being shut in by high land, the wind necessarily blows up or down it, and consequently if the wind is not favourable on entering, the vessel should anchor. A ship having gained the bay of Chalcis, should anchor under Karn Baba, taking care to avoid the fairway of the channel, so as to relieve the strain on her cable from the frequent changes of the current, which is very rapid.

The bridge is eighteen feet wide and eighteen deep. A bank to the North, on which there is not more than fourteen feet and a half, is to be cut away to the same depth; on which account the bridge is to be barred again, it is said, for three or four months on the 13th of May. The strength of the current, which is generally six knots, in strong winds reaches ten or twelve knots; at which time the water rises three feet, while generally it does not exceed a foot and a quarter, and it is always highest at the commencement of the descending current. Although these tides are most capricious it is believed that they follow the usual laws of tides with the establishment of 3h.; but this must not be taken for granted since the change in direction seems to arise rather from the effect of the wind on the superior and inferior basins.

Since the opening of the bridge five vessels of 350 tons have passed through, and those from two to three hundred tons pass every day, without reckoning coasters. The little Greek steamer *Belisario*, employed in the removal of sand raised by the dredge, frequently passes through, and two vessels with mails, the *Telemaque* and the *Tage*, have lately gone through.

An Hydriot who has the management of the bridge is a good pilot to consult, and even to take on board to choose the most favourable time for passing when the current loses its strength; but to attempt to pass when the water is rising would only be risking the probability of damage. On the reopening of the bridge, means for warping will be arranged on both sides of it and will be of great service, for, having passed it, a vessel quickly finds herself in the Gulf of Talanta, beyond the critical point.

After the reduction of the northern bank, the two dredging-vessels will be sent to Bourgi to do the same there; in the mean time it will be buoyed as soon as moorings arrive from Syra. Two lanterns have been ordered; one of which will be placed in the tower of Bourgi, and the other on one of the islands off Cape Aia Marina,—and a tower will be erected on Sunk Rock. The improvements, when they are carried out, will render the navigation more secure and expeditious, but it is uncertain when that will be.

The expenses of passing through are of three kinds.

1st.—Anchorage dues at Chalcis, 12 lepta per ton; 9 for ships which discharge; 3 for those which partially discharge.

2nd.—*Dues for passing the bridge:*—100 tons pay 29 drachmes; 150 tons, 36·50 dr.; 200 tons, 44 dr.; 250 tons, 54·50 dr.; 300 tons, 59 dr.; 350 tons, 64 dr.; 400 tons, 69 dr.

3rd.—*Various dues:*—The charge for the pilot; the purchase of charts; treating the Hydriot at the bridge—not actually necessary; and, if required, the anchorage dues at the bridge, where it is usual to seek a pilot for the other channel.

From the foregoing it is clear that this passage is available for ships drawing as much as sixteen feet of water; but it will be of no use either for steamers or sailing vessels unless they are going to the Talanta Channel. For every other destination it will be preferable to stay at Karysto or to endeavour to get out by Mikoni until a reduced tariff, a system of pilotage and buoying, of lighting and towing, renders this interior navigation more secure and rapid: for a captain will never find it to his advantage unless these expenses are not greater than those incurred by his stay at Karysto. At all events we must wait some months for the reopening of the port.

The Hawaiian or Sandwich Islands in 1858.

The Hawaiian Archipelago consists of twelve islands, which lie in the North Pacific Ocean, between 18° 50′ and 22° 20′ N. lat., and 154° 55′ and 160° 15′ W. longitude from Greenwich, and stretch along in a direction W.N.W. and E.S.E. about 350 miles, and contain about 6,000 square miles.

Name.	*Length.*	*Breadth.*	*Ft. High,*	*Sq. Miles.*	*Population.**
Hawaii.....	88 ..	68 ..	13,953 ..	4000 ..	24,447
Maui	48 ..	29 ..	10,200 ..	600 ..	17,574
Oahu	46 ..	23 ..	3,800 ..	520 ..	19,126
Kauai.....	33 ..	28 ..	4,800 ..	520 ..	6,990
Molokai.....	40 ..	9 ..	2,800 ..	170 ..	3,607
Lanai	17 ..	9 ..	1,600 ..	100 ..	600
Niihau	8 ..	7 ..	800 ..	80 ..	790
Kahoolawe...	11 ..	8 ..	400 ..	60	
Molokini.....					
Lehua	Islets scarcely more than barren rocks.				73,134
Kaula					
Niihoa, or Bird Island.					

The average temperature in low southern and western locations is 75°; in northern and eastern, 72°. The lofty mountains are cool, and at their summits cold. A summary of meteorological observations made by the missionaries at Honolulu, from August, 1821, to July,

* By official census of 1853.

1822, shows the mean temperature to be 75°; N.E. trade winds three fourths of the year; rain on forty days; highest heat observed in the shade, 88°, lowest 59°. During the months of January and February the thermometer sometimes falls to 53° and 54° during the night.

Hawaii.—This island consists essentially of the three mountains of Mauna Kea, (13,953 feet high,) Mauna Loa, 13,760 feet high,) and Hualalai, (about 11,000 feet high,) of the elevated plain between these mountains, and of the more or less gentle slopes from their bases to the sea. On the windward side, owing to the abundant rains, vegetation is luxuriant. Here is situated the fine harbour (the only one on this side) and pleasant village of Hilo, in the vicinity of which are three sugar plantations, managed by Chinese, and at present doing well. Coffee attains to a large growth, and bears well on this side of the island, but the quality is not considered equal to that raised on the leeward side.

From Hilo, round to Kahala, facing the North-East trade winds, the land near the sea is composed of precipitous bluffs, broken frequently by enormous gulches, or ravines, through which the mountain streams from the side of Mauna Kea, debouch into the ocean. Though bleak from its constant exposure to the strong trades, this portion of Hawaii is rich in agricultural resources, and as a grazing section is unsurpassed. The "Kona," or leeward side of the island, which is formed by the S.W. slope of Mount Hualalai, presents to the eye, on passing along the shore, a very desolate appearance, and, in fact, from Kawaihae to Kealakekua, and thence quite round to Kau, on the S.W., varying in width from a half to two miles from the beach, there seems to be little else than black lava rock, the debris of extinct volcanic action. But from Kailau to Kealakekua, at an elevation of from 500 to 2,000 feet, the soil among the decomposing lava seems of inexhaustible richness.

There are not far from 100,000 acres of arable land in this district, of which about one fifth, or 20,000 acres, are suitable for the cultivation of coffee. Its present product, however, does not much exceed 100,000 pounds of coffee per annum in the most favourable seasons. The finest oranges on the island are grown here, and it is pretty generally conceded that this is the best fruit district on the islands. Good judges have pronounced Kona coffee the best grown on the islands, and oranges, pineapples, grapes, mangoes, and a variety of other fruits, are said to attain a perfection rarely found in other Hawaiian localities. The common castor-oil plant is frequently seen here with a trunk five or six inches in diameter, and branching out like a tree, the lowest branches several feet from the ground.

The south-western side of the island, which forms the district of Kau, fifty-five miles in length, is, in most parts, like the Kona side, composed of barren rocks from the sea for several miles inland to where the arable land commences, and spreads out into a broad plain, gradually ascending to the mountains, admirably fitted for pasturage. Latterly the cultivation of wheat has been introduced in the more elevated portions of Kau, and has been found to succeed well.

The active volcano of Kilauea, and the intermittent one of Mauna Loa, are well known. The crater of Hualalai has been quiet since about the beginning of this century. It has been rarely visited, though said to be well worth seeing. The crater is described as being large and irregular from cones and chasms, but having near the centre a black-mouthed pit of no great diameter, but of immense depth, its sides as smooth as glass. Our informant (a respectable foreigner) says that he threw a large rock into it, and, if he noted the seconds correctly, the depth reached before it struck anything must have been considerably over one thousand feet, while the stone was heard still falling at a much greater depth.

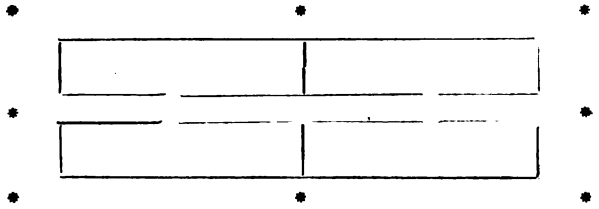
On the sides of Mauna Kea, at an elevation of from 6,000 to 11,000 feet, roam large herds of wild cattle, composed of the descendants of a number turned loose on the mountain in the times of Kamehameha I., recruited largely, no doubt, by runaways from the tame herds of Waimea. This last is a level plain, about twenty miles wide, between the Kohala mountains on the N.E. and the highlands of Mauna Kea on the S.W. It was formerly covered with a forest of kukui and ohia trees; but the rapid increase of cattle there within the last thirty years, has resulted in the utter destruction of the forest, and a consequent change of climate. Old residents speak of the climate of Waimea as having been moist and salubrious, whereas at present it is dry, but little rain falling the year round, and exposed to the full force of the cold trade wind, which, at that elevation, about 4,000 feet, is quite chilling.

Napoopoo, Hawaii, March 10th, 1858.

Dear Sir,—In the *Advertiser* of Feb. 25th, I notice a description of the several islands of this group. I think a little alteration might be made in relation to Hawaii. This island is ninety miles from the N.W. point to the S.E. point, and from the S.E. to the S.W. eighty miles. In speaking of Hualalai one would suppose, from the description given, that there was but one crater, while there are at least sixty. So says Mr. Remy, a French gentleman who spent one month on Hualalai. I counted twenty-four craters at one time, and not very high on the mountain either. The crater that you speak of as being so very deep, is the very Hualalai into which it was the custom in old times to throw dead persons. I have looked down and thrown stones into it as often as any other white man except Mr. Remy, and I do not think it can be over two hundred and fifty or three hundred feet before the stones strike. As for a large stone or "rock," I think one would have to go at least one hundred and fifty feet down to find one. During the several times I have been there I never saw anything about the crater that looked like glass, nor anything smoother than common *pahoehoe*. Mr. Remy told me that he had often looked down into it, and by putting his hand above his eyes in a short time could see the bottom and see bones lying there. To hear a stone strike at a distance of one thousand feet below, one must have an excellent ear;

something like the man who could hear plants breaking their way upwards through the ground.

The crater is some twelve or fifteen feet in diameter, and is at the termination of a sharp peak. On the back of this mountain, Hualalai, there still exists an old ruin called Hua Umi, some forty by fifty feet square, like the foundation walls of a house, about five feet high. It is divided into four rooms, with an alley through the long way, having two rooms on each side outside of these walls. At a distance of some twenty or more feet are eight large piles of stones, one built by each of the districts on this island, one by the priests, and one by the king.



A little further East is an old cock-pit, which is merely an enclosure four or five inches high. The cocks were put in the enclosure, and the first one that got outside was said to be beaten—so the story runs.

I have been on the very top of Mauna Loa, and well up on the side of Mauna Kea, and all that I have seen on these two mountains is but a drop in the bucket in comparison with what I have seen on Hualalai. The different varieties and large number of craters; the old extinct streams of lava, where for part of the time the lava has run under the surface and sometimes above; the great number of caves of all manner of shapes, in many of which the lava hangs over head like icicles, while others are smooth; in some places a very good soil, in others coarse sand or fine gravel. Every other person that I have seen, who has ascended this mountain, is of the same opinion as myself. The mountain is eight thousand two hundred and twenty feet high. This I saw on one of Wilkes' charts. Mr. Remy made it about the same height. One can ride on horseback to the highest peak.

Yours, &c.

P. CUMINGS.

Maui.—This island, the next in size and position to Hawaii, being separated from the latter by a channel about thirty miles wide, consists of two mountain masses, separated by an isthmus some six miles in width from sea to sea, and from six to ten miles in length. Eastern Maui is much higher than Western, consisting chiefly of Haleakala, (House of the Sun,) 10,200 feet high, and its immense slopes. It also includes much the most arable land, and here are situated two fine sugar plantations, the East Maui Plantation, under the direction of A. H. Spencer, and the Brewer Plantation, L. L. Torbert, manager. Others are projected, or in progress of planting. East Maui possesses

some of the finest sugar lands on the group. Here also are situated the immense *kula* lands, or arable plains, which a few years ago supplied the Irish potatoes with which a brisk trade was carried on with California, and from which at present the whalers are furnished with most of their supplies. At Makawao are the wheat lands of the group—at least here is the spot where the cultivation of cereals has been a success. About 2,000 acres are under cultivation, with a product of 20,000 bushels per annum. The business is steadily increasing.

The isthmus of Waikapu lies but little above the level of the sea, and is composed of dry sand. Since the goats and cattle have been allowed to run there, they have destroyed the vines and bushes which served to confine the sand on the windward side, and the "dunes" have been driven nearly to the leeward beach, and will soon usurp the whole of the lower part of the isthmus. The wind here rushes across in fierce gusts between the two divisions of the island, and renders the navigation of the bay at times quite dangerous. On the western slope of the isthmus, and towards the windward side, lie the cultivated portions of Waikapu and Wailuku, which, with the valleys behind them, are very fertile. The level plain of Lahaina, composed of the alluvial washed from the hills in the rear of the town, is remarkably rich, and capable of producing largely of most kinds of fruits and vegetables. Grapes grow rapidly, bear profusely, and are of a fine flavour. With these exceptions, most of West Maui, not inaccessibly mountainous, is grazing land.

Kahoolawe—is situated about twenty-four miles W.S.W. from Lahaina, off the N.W. side of East Maui, about twelve miles. It is quite dry, but might perhaps make a sheep pasture. It has been but little used hitherto, except occasionally in former years as a penal settlement. Natives occasionally go over there for a few months for fishing purposes, or during the rainy season to plant melons and sweet potatoes. The island is said to contain 25,600 acres, of which about 3,000 is table land.

Molokini—is a small, bare, uninhabited rock in the channel about midway between Kahoolawe and East Maui.

Lanai—lies opposite Lahaina at a distance of from eight to twelve miles, and is about sixteen miles long by about eight wide. Though higher than Kahoolawe, it is too low to receive a large quantity of rain, and though there are a few good lands upon it, the population is scanty. There is but one permanent stream on the island, that running down the valley of Maunale, which opens to the N.E., directly facing Kaluaaha, or Molokai. The Mormons have tried for some time to make Lanai their head-qua ters in the group, but with indifferent success.

It is said that Lanai, if turned bottom up into the crater of Haleakala, would about fill it.

Molokai—This island is long and narrow, the eastern end much the highest point, rising into mountains nearly 3,000 feet high, and sloping off gradually to the western point. The arable land on the

windward side is narrow, and much of the windward coast is formed by bold precipices of bare lava rock, rendered wild and jagged in appearance by frequent frightful gulches and ravines. The natives, in speaking of Molokai, term it *ka aina pali*,—a land of precipices. Some of the windward portions for a large part of the year can be approached only by sea and that in good weather, the foot-paths over the mountains being often impassible. The leeward side presents a much more gentle slope to the sea and contains some fine land both for culture and grazing. Some of the valleys towards the eastern end present scenery unsurpassed in magnificence. The western end of the island is too low and dry to be worth much, unless perhaps for sheep pasture. The population of Molokai is apparently more industrious and enterprising and also healthier than that of most of the other islands of the group. Since 1853 the population has been gradually increasing. There are one or two dairy farms on the island, from which an excellent article of butter is sent to the Honolulu market, and occasionally some very fine cattle. There is an indentation on the leeward side of the island, at a place called Kalae, which at a moderate expense might be converted into a good harbour for coasters. At present only very small vessels can get over the bar.

Oahu.—Commercially, Oahu is the most important island of the group. It is formed by two ranges of mountains, the highest of which—Konahuanui at the pass of Nuuanu—is about four thousand feet above the level of the sea. One of these mountain ranges runs from Makapuu Point, at the eastern end of the island, along near the windward shore till it sinks into the low plain of coral rock at Kahuku; the other, or Waianoe range, commencing on the leeward side of Ewa at Barber Point, and running some ten or twelve miles towards the first range, with which it makes an angle, then turning with a sharp elbow and running down to Kaena Point, leaving Waialua on the right or windward side. The first range presents to windward, for almost its whole length, a perpendicular wall of rock several thousand feet high, with comparatively level land extending from its base to the sea, varying in width from nothing, as at Makapuu pali, or ten rods, as at Dr. Judd's land, to six or seven miles opposite the pali of Nuuanu. Through this low land at intervals are thrown out from the main range several ridges or spurs of hills, usually ending at or near the sea with an extinct crater; as it were ribs from the back-bone. The soil of the low land mentioned is generally good, and pretty well watered. The climate, as on the windward side of all the islands, is more moist and several degrees cooler than on the leeward side.

Honolulu, the seat of the Hawaiian government and the commercial emporium of the islands, is situated on the leeward or West side of the island, on a level plain directly opposite the beautiful valley of Nuuanu. The city has slowly but constantly increased in size during the past ten years, and its population amounts to between 8,000 and 9,000 inhabitants, of whom 1,500 are foreigners. It has a fine capacious harbour, formed by the coral reef, capable of accommodating 200 vessels at a time, and is perfectly safe in all weathers.

The leeward side of the mountains presents a gentle slope. The Kona, or Honolulu district, is divided like the Koolau or windward district by the spurs of the mountains into three distinct divisions. The first is of some three or four miles extent, from Makapuu to Koko Head; the second from Koko Head to Diamond Head, ten or twelve miles; and the third from Diamond Head to Moanalua ridge, including the city of Honolulu, some eight to ten miles. Had Punch-Bowl Hill extended farther seaward, it would have made another division.

From Moanalua ridge to Barber Point or Waianae Mountains, is the Ewa district. The most remarkable feature of this is the so called Pearl River, a large and irregular shaped lagoon, somewhat freshened at its inland extremities by the streams that run into it, but connecting with the sea by a number of navigable passes. It is incorrectly represented on the maps, being in fact much cut up by points and islands. Its main channels and open spaces are, however, with the exception of the bar at the mouth, deep enough for any vessel. Jarvis is wrong in calling the adjacent land dry and barren compared with Honolulu. The immense flats between it and the sea and those which stretch off beyond it for seven or eight miles to Barber Point, with a width of five or six miles, are, it is true, barren enough, being great stretches of clinkers, broken masses of all sizes, with solid rock beneath of feldspathic lava, with here and there a deep pit or sudden crevice. Bushes and scattered tufts of grass keep fat the cattle that range there, and occasionally serve to conceal the mouth of a pit from unwary cattle or horses.

Along the inland shore of Pearl River is a strip of very fertile land, varying in breadth, some of which is now cultivated with taro and bananas, but a large proportion is lying idle. Then the land rises gently into the elevated plain which extends between the two mountain ranges mentioned previously, towards Waialau, descending somewhat more steeply into the lowlands of Waialau, at a distance of two or three miles from the sea. This plain is interrupted by several deep gulches—something like the California canoñs, which yawn in the traveller's face with scarce any warning. Their courses are very irregular—one runs from the main range of mountains zigzag across the plain towards the Waialau Mountains, until at about the elbow or angle, when it turns and follows along their base to the sea at Waialua.

The slope of the mountains on the right from Moanalua to Waialua presents much land in its valleys and on its small elevated plains, which, were the island fully peopled, would undoubtedly well repay cultivation. In some of the valleys large quantities of excellent oranges are already raised. Most of the plain, say nine miles by twelve, is grazing land. The heads of the valleys and the ridge of the main range are heavily timbered with kukui, ohia and some koa, and occupied now only by wild cattle and hogs. Turkeys and chickens, too, are numerous—estrays from domesticated stock. The Waialua flat, some two or three miles by about five, is very fertile, and the

climate to many more agreeable than Koolau or Honolulu. From Waialua to Kahuku the surface is hilly, and merely a good pasture. Kahuku is quite a level plain, some five or six miles by two, extending from Waimea to Kahuku Point. It is but slightly elevated above the sea, and consists of soil-covered coral in position, evidently little disturbed by its upheaval. At many of the frequent holes and crevices in it may be seen streams of fine clear and cool fresh water, making their subterranean way three or four feet below the surface from the mountains to their outlets in the sea below low water mark.

The Waianae district, protected by its mountain range from the trades, and exposed fully to the afternoon sun, is for the most part very warm, though a strong gust from the trade wind will sometimes break over with violence. But a small portion of Waianae is arable land, by far the major part being devoted to grazing purposes, for which it is admirably adapted, producing probably the best beef on the island for the table.

The main range of the Oahu Mountains has a break or passage through it at the Nuuanu valley, often described as the celebrated "pali of Nuuanu," and is passable for footmen at the heads of several of the valleys. The Waianae Mountains have but one path over them, that near the elbow at Lihue,—other access or exit to or from the district is only by water or round the Ewa or Kaena ends of the range. The last is a difficult and at times a dangerous path.

Each of the above districts of Oahu has, even at the same elevation above the sea, its peculiar climate, perceptible to an ordinary observer. The difference is due to different degrees of moisture and of exposure to or shelter from the trade winds. Those winds are also modified very much by the extent of land over which they have blown after leaving the sea, and by the character of that land, as covered with verdure or bare rock and earth made scorching hot by the rays of the sun.

Oahu is more properly and naturally a grazing than an agricultural island, though the quantity of arable land scattered at intervals over its surface is amply sufficient to support a large population.

Coco Head Telegraph.—The benefits of the Diamond Head Telegraph having been practically demonstrated to the mercantile community, and a general desire expressed to have it extended to Coco Head, Mr. Jackson, aided by Mr. Webster, has recently superintended the erection of a telegraph at the latter point, which is the southern extremity of Oahu. From this station vessels can be seen some twenty miles beyond the head, or more than thirty miles from the port. All vessels passing through the channel between Oahu and Molokai during the day time, can be telegraphed, even if bound past to China. When the winds are light, vessels will be thus signalled several hours before coming in sight from the town, and if we had a steam tug that dared to go out of sight of land, it might be of great service in towing in vessels from a distance. We understand that the amount subscribed thus far is insufficient to carry on the telegraph, and hope it will be liberally

aided. We trust that all shipmasters will aid in establishing this work, which will be of advantage to them as well as to those residing here.

Kauai—generally called the oldest of the group, is one of the pleasantest. It is separated from Oahu by a channel about eighty miles wide. The difference of latitude between Kauai and the southern part of Hawaii is enough to make a perceptible difference in climate. The shape of the island, also, allowing one (as at Lihue and Wailua) frequently to take in a wide stretch of landscape without having his view bounded by the sea—allowing him to feel as if he was in a great country—makes the scenery, which is very beautiful in itself, much admired by those whose insulated vision has perhaps for years ranged only over the narrow strip of land between the Honolulu hills and harbour. The eye, which for a long time has found every view bounded by the ocean, (as is necessarily the case on most of the islands,) making the observer aware of his insulated, almost imprisoned life, finds great relief in a view which allows it to strain itself to see further into land stretching beyond its bounds, without finally resting on the white spray of the breakers. Consequently, the beauties of Kauai,—Hanalei valley, Hanapepe waterfall, Holoa spouting rock, (there are many others on the islands,) the Mana singing sands, &c.,—have been written and printed about sufficiently. The last, which have seemed a puzzle to some tourists, are very easily explained. The piles of sharp clear sea-sand on the beach, under a hot sun, when set in motion by the hand or the wind, or perhaps sometimes by their own expansion of heat, in their friction on each other give out a rather faint but clear and distinct tinkling sound. The peculiar shape of the sand particles, traceable to the original rock from which they have been separated may account for the non-observance of the same phenomenon elsewhere. In the morning or after sundown, when moist with the dew, or after rain, they are silent.

The tract of arable land on Kauai adapted to grazing or planting, stretches from Hanalei to Hanapepe valley. Portions of this island appear better adapted to agriculture than the other islands. There are two coffee plantations at Hanalei, a sugar plantation at Nawiliwili, and one at Koloa. This portion of the island is well watered with frequent rains and streams. The principal ports of the island are Hanalei, on the North side; Nawiliwili and Koloa, on the S.E.; and Waimea, on the South. The Waimea district being the lee of the island, is dry and adapted to cultivation only in the valleys. That part of the island stretching from Mana point around the western side to Hanalei, is rocky, dry, barren, and uninhabited. The same remark may be made of all the islands as of Kauai, that capital with an industrious population is the only thing needed to develope resources now lying almost wholly idle.

Niihau.—This island, the last of the group which is inhabited, lies in a S.W. direction from the Kona side of Kauai, distant about eight miles. It has a range of hills, some 800 feet high, running through it from the weather end, along near the eastern shore, nearly to the

southern point. The land on the eastern side of these mountains is very narrow, with but a sparse population; but on the western side there is a level plain of some four or five miles in width, excellent land for sweet potatoes, melons, &c. There is no fresh water on the island, except rain water, preserved by the natives in some cisterns of rock near the South end.

Lehua,—about three-quarters of a mile off the western side of Niihau, is a high and somewhat broken peak, apparently two sides of a crater, of which the S.W. portion has fallen in, leaving the inside face exposed in that direction—a black and broken precipice. Jarves calls it 1,000 feet high, but 500 feet would be nearer correct. The faces towards Kauai and Niihau are covered with scattered tufts of grass, among which numerous wild rabbits find a living. The most singular thing on the island is a small perennial spring of excellent fresh water, a few feet above high water mark. The rock itself is lower than the Niihau mountains, and neither of them receive water enough to supply any spring. Consequently the water must come from the mountains of Kauai, whose nearest shore is at least twelve miles distant.

Kaula—is in sight from Niihau, and some seven or eight miles off its S.W. point. It is a barren rock, abounding in sea-fowl and their eggs, for which the natives occasionally visit it. A landing can be effected only in the calmest weather, as the surf breaks very heavily at all times.

Niihoa,—or Bird Island, about 120 miles N.W. from Kauai, was always reckoned by the natives as belonging to the Hawaiian group, and in ancient times was not unfrequently visited by the chiefs. Fish, birds, and eggs, as well as sea-lions, and perhaps turtle, they obtained there,—and these comprise the list of its productions. It is a precipitous rock, described by Captain John Paty as 400 feet high, one and a half miles long, and half a mile wide. A landing can seldom be accomplished with safety with ordinary boats, though canoes might succeed better.

The Indian Ocean considered with Reference to the Wants of Seamen.

(Continued from p. 327.)

The route for Canton through the China Sea becomes uncertain when Pulo Sapata has not been reached by the beginning of October. In fact, about the middle of this month strong southerly currents are found in the vicinity of that island. The light northerly and variable winds and calms which prevail at this period often prevent vessels from continuing their northerly route; in which case, in order not to

be delayed, a vessel should adopt the eastern route, taking care to avoid the shoals to the eastward.

The southerly currents found near Pulo Sapata gradually decrease, and with the help of the favourable winds often found there, a ship may reach the parallel of 13° or 14° N. lat. without much difficulty, where currents are not so formidable as in the vicinity of Cape Padaran, Pulo Sapata, or the Catwicks. A ship having attained the parallel of 13° or 14° will be North of all the banks, and then, should the wind permit, she should get to the eastward, in order to make sure of crossing to Macao from the coast of Lucon. In this same season, also, the same route is adopted for Manila. The N.E. or E.N.E. winds, which often extend beyond the parallels of 12° and 13° N. lat., render it difficult to make easting, and long boards should be made to the northward, and advantage taken of variable winds, to make easting, for it is not prudent to sight the coast of China West of the Great Ladrone.

A vessel late in the season should take the Palawan route, because the southerly currents and the light breezes near Pulo Sapata and in the China Sea render that passage uncertain.

From the middle of November until February ordinary sailing ships generally make the voyage to China by the eastern route, or else enter the Sooloo Sea by the Strait of Balabac, and, steering northward, successively stand along the coasts of Mindanao, Negros, Panay, Mindoro, and Luconia,—a route previously mentioned. According to Horsburgh, it is the shortest that can be taken after the beginning of November.

A steamer of small horse-power going from Singapore to Hong Kong during the height of the N.E. monsoon, should pass West of the Anambas; then, steering N.E., may pass the Natunas Islands at some distance, and then continue her N.E. course for the meridian of 115° E. long. She may then run to the northward and leave the Paracels to the West, and make direct for Hong Kong against the monsoon. By passing West of the Anambas, a smooth sea may be expected. Having reached the part before mentioned, going to the northward, strong breezes will be met, sometimes from the northward. Nevertheless, by sail and steam, and taking the best advantage of the wind according to its changes, a steamer will generally make the passage in ten days.

When the height of the monsoon is over, that is, in April, May, or June, a ship may take a more direct route than this. Leaving the Anambas to the westward, she might make for Pulo Sapata; then steer a little West of the Paracels; and then direct for China. If she meets with constant foul winds it will be useless for a steamer of small horse-power to attempt to steam.

There are others who consider the following a more advantageous route than those above mentioned. They say a ship should pass inside Pulo Aor, cross the Gulf of Siam as far as the coast of Cochin China, and afterwards make to the West of Pulo Condore and Pulo Cecir de Mer; continuing then along the coast of the continent as far

as the parallel of 15° N. lat.; then making for Hainan, and keeping the land on board. In this season a strong current, however, sets southerly along the coast of Cochin China and the wind is no where light. Hence the former route, taken, during the height of the monsoon (N.E.), by the *Vixen*,—which vessel made the passage in ten days (9 days 23 hours) from Singapore to Hong Kong,—appears preferable. The distance is about 1,522 miles: the mean speed of this vessel would therefore be about 6·5 miles an hour.

Route for a steamer from Hong Kong to Macao.—On leaving Hong Kong in a steamer for Macao, the channel between Hong Kong and Green Island should be taken, in which there is water sufficient for the largest vessel. She should steer for the North point of Chung Chou or Water Island, to pass between this island and Lantao. In the middle of this channel there is a large rock not shown on the charts; it is level with high water and is visible as it is approached. The vessel should pass between this rock and Chung Chou, and the least water will be six fathoms. She would afterwards take the channel between High Green and Lantao, and, keeping in the middle of it, will not find less than seven fathoms. Beyond here the chart will direct her, and this is the shortest route from Hong Kong to Macao.

A ship leaving Macao bound to the southward, against the S.W. monsoon, should make for the Macclesfield Bank, keeping between the meridian of 113½° and 116½° E. long., and profit by every change of wind. Having passed Paracel, she should continue to the southward without making long boards to the westward, so as to approach the coast of Cochin China, on account of the strong northerly currents off that coast, which sometimes set fifty miles in twenty-four hours. She would therefore make small tacks, keeping the channel between the coast of Cochin China and the shoals East of it, taking care not to sight the coast of Cochin China at all, and not to stand further East than the meridian of the Investigator Shoal.

After passing Pulo Sapata, she would make small tacks, avoiding the entrance of the Gulf of Siam, where light variable winds from the southward will be found. Sometimes, however, W.N.W. winds are to be had, and even N.W., but they are never of long duration. The Natunas may also be sighted to the southward, and then the channel may be taken between this island and the Anambas. It is better in general to take this channel than to sight the Malacca coast and the island of Timoan, off which light southerly winds with calms are found, which oblige vessels to anchor, so as not to be set to the northward by the current. A vessel will thus reach Singapore or the entrance of the straits leading to the Sea of Java.

This passage may be made in thirty-three days, and the distance from Macao to Singapore is considered about 1,350 miles.

From the above it is evident that a good sailing vessel may work down the China Sea the whole way against the S.W. monsoon. At some periods, however, it is a passage not without great difficulties. In June, July, and August, for instance, a vessel of ordinary speed should not attempt it unless she can start with favourable winds on

leaving the China coast; and even then, with a good vessel, bound to some western part of India, she should not take this route during those months unless compelled to do so. A vessel leaving China early may make a tolerable passage to Bengal by this route. Nevertheless, if bound to Bombay a vessel will have a long passage from Acheen there in October and part of November. A vessel leaving China in May or June will probably reach Bombay as soon or even sooner by the Eastern straits than by crossing the China Sea to take those of Malacca or Sunda.

Before we proceed with the routes from the ports situated in the North part of the China Sea, we will treat on those which may be made among the islands forming the Eastern passages, these being in direct connection with the navigation of the South part of the China Sea.

Routes from the East straits to Singapore.—The route for Singapore from Java, Bally, or Lombock, when the S.E. monsoon is far advanced, is often long and tedious on account of the S.E. current having commenced in October. After passing Pulo Mancap, a vessel often finds light breezes, frequently from the westward and N.W.

The following details may prove useful to vessels taking this route, which is termed the North route by Captain M'Kenzie in the *Nautical Magazine*.

After leaving Lombock and Bally Straits, the easterly winds will take a vessel beyond Pulo Mancap. The best route up to that point will be to pass between Pondy and Galion Islands: this may be done in perfect safety even during the night. The ship should then pass South of Lubeck Island; then keeping well to the southward and westward of the banks off Pulo Mancap and giving a good berth to the Discovery Bank and other adjacent dangers of the western part of the channel. She would then make for the eastern of the Montaran Islands, and take the channel between this island and that nearest West of it, for it is perfectly safe. She would then steer N.W. along the North shore of Billiton, but should not pass within the banks of Montaran, because at this season of the year the wind is seldom more westerly than S.W.; consequently, a vessel would be in a sufficient position in starting from the eastern of the Montaran Isles, in order to pass to the southward of Pulo Docan, Pulo Taya, and Pulo Sinkep, especially the latter, if possible, in order to take the Brahalla or Great Channel. If not, the vessel should take the strait of Dasee, South of Lingin.

After leaving either of these straits, the vessel may make for Singapore through Durian Strait. On the West coast of Sinkep and Lingin, and in Dryon Strait, regular tides will be found, besides favourable changes of wind from the Sumatra shore. The Sumatra breezes are sometimes preceded by a calm, and if the tide is contrary the ship should anchor and wait a tide. These Sumatra breezes should be prepared for with double reefs, for a ship should not have to shorten sail and thus prolong her voyage.

On the eastern coast of Linga, the current sets from the China Sea strongly to the southward. Besides, the wind here is often N.W. and North, so that a vessel can make but little progress until she has entered Rhio Strait. Again, it is frequently the case that a ship can only get on by working to windward, and is obliged to continue on a bowline all the way to Singapore. In this case it is better to take Dasee Strait (between Linga and the island North of it), instead of passing East of Lingin, in order to enter the strait of Rhio or Singapore.

Route from Singapore to Java by the Strait of Carimata.—When a ship has to work through the Carimata Strait against the S.E. monsoon, the best route on leaving Singapore will be to pass through Rhio Strait,* and then make for the coast of Borneo and work by short tacks along this coast, anchoring when the tide is against her. On leaving Kumpal or Rendezvous Island she would make for the coast of Java, and if going East she would work near the coast. The passage to Sourabaya can be easily made thus in fifteen or twenty days.

Vessels from the eastward of Java, Bally, or Lombock, bound to Singapore in the N.W. monsoon, may adopt either the southern or northern route. The one passes South of Java by one of the eastern straits, from whence the trade winds will soonest be found, which will take a ship far enough West to enable her to reach Cape Acheen and cross the Strait of Malacca;—the other crosses the Java Sea and the Strait of Carimata. The mean length of these passages is about sixty days, and the strong winds and heavy seas are very trying to ships. Captain McKenzie prefers the eastern route to either of these.

By this route a ship reaches the Molucca Channel, or even Gilolo Strait, crosses the Celebes Sea, and the Sulu Archipelago, and thence, with North or N.E winds, passes through Balabac Strait to the China Sea, which is then crossed to Singapore. This route, which at first appears very circuitous, is however that by which the shortest passages are made, at least according to that officer. We shall go into it presently more minutely, that is, the eastern route from the Moluccas.

Route from Amboyna to Banda.—A ship leaving Amboyna for Banda during the height of the S.E. monsoon (July, August, and September), should stand to the southward, even to the Timor coast; near which at this season the current sets easterly, and where the wind is found varying E.S.E. and S.E., by which Banda may be reached on the starboard tack. This passage frequently takes only six days. By going North of Ceram it would be much longer.

During the N.W. monsoon the route is direct from Amboyna to Banda.

Amboyna to Ombay Strait.—A ship leaving Amboyna in the N.W. monsoon for the westward by the southern route, leading to the Indian Ocean, should persist in passing North of Timor, and round it to the

* *Sic.*—Surely either of the two straits between Linga and Sinkep Islands is here meant.—Ed. *N. M.*

West. In fact, should the ship fall to leeward of this island, and is obliged to round it to the East, she will have great trouble in getting to the westward between it and New Holland in the Timor Sea; where, from November to April, a heavy sea prevails, with strong westerly and W.N.W. winds and cloudy weather.

In case a ship is obliged to round Timor on the East, she should work along the South coast of the island and run through Limao Strait, for by keeping North of the Sahul Banks and near the coast, she will find less sea and less wind than out at sea.

East Route from Amboyna to Malacca or India.—But the southern route from Amboyna or any of the Moluccas for the Strait of Malacca or India, should not be taken in the height of the monsoon (N.W.). For a vessel starting before March, the eastern route, indeed, is preferable, especially if she be going to the Strait of Malacca and Gulf of Bengal.

Adopting the eastern route from Amboyna, a ship should endeavour to reach the Island of Amblan, and then work up for the East coast of Bouron, so as to profit by the land breezes and squalls which are found there. She would thus avoid the southerly and S.E. currents which frequently prevail at this period near Amboyna, Ceram, and Manipa. Having reached Point Lisatika (West end of Bouron), she should make for Oby Major, towards the Gilolo Strait; and, having passed through this strait, should attain as soon as possible the parallels of 5° or 6° N. lat., without caring to make easting, for in these parallels the N.E. monsoon prevails. She should then pass North of the Meangis, and make the South point of Mindanao, and pass between Mindanao and the Serangani Islands, and then run for Basseelan Strait, by which to enter the Sulu Sea. If this strait be entered in the morning with a favourable breeze, a vessel will clear it by the evening; if not, anchorage may be had at Samboangan. On leaving the Strait of Basseelan, the ship should pass to the northward of the Sangboy Isles, and then run for Cagayan Sulu. From this island, avoiding the dangers to the northward and westward, the channel formed by Bengury Island and the Mangsee Isles should be taken; from whence the ship would enter the China Sea, and then take the Strait of Malacca.

On leaving Amboyna in March for India, the Southern route should be adopted; and as during this month the wind frequently becomes more Westerly, it will be better to make for Isle Bouron, and afterwards to stand for the islands of St. Matthew, for the purpose of working to windward under them. Having reached Velthoens Island, the ship should make to the Southward, and if the wind permit take Aloo Strait, as preferable to that of Panthar; and having passed it, should make as much westing as she can, and pass between Sandal-Wood and Savu Islands, or East of this latter island if there be any difficulty in rounding its western end.

A ship leaving Amboyna from April to August, should stand towards Gunung-Api, taking care to give a good berth to the Lusapara

Isles. Passing East of Gunung-Api, the ship should make for the Western end of Wetta, in order to pass between Ombay and Pulo-Cambing, and then take the Ombay Passage between Ombay and Timor.

A ship having thus reached Rottie or Savu Isles, will find S.E. winds gradually freshen. She should endeavour to pass South of Savu, from whence she may reach India in twenty or thirty days.

Batavia.—A ship going from the Moluccas to Batavia during these months, should steer so as to sight Isle Roma, taking care to avoid the bank extending eight miles from its N.W. point, and then pass North of Wetta. From thence she should make for Pulo-Cambing, and keep along the North coasts of the islands between Ombay and Flores. If desired, she may pass between this last island and Isle Rusa-Raji; she will continue along the North coasts of Sumbama and Lombock, and from the latter island may pass between Hog and Galion Islands, or North of Urk, between the Four Brothers and Kangelang. From thence she would stand along the coasts of Madura and Java.

We will revert to the navigation of the China Sea.

Navigation of the Gulf of Siam.—A ship from the Southward, in the S.W. monsoon, bound to Siam, after leaving Pulo-Timoan should keep out at sea until she has passed Pulo Varela. If the wind be favourable, she may pass inside it, and should afterwards steer so as to pass inside of Pulo-Brala, as the wind often hangs to the Westward; thence she may take the channel between the outer Great Redang Island, and that inside of it. Thence she may stand for the N.E. side of Pulo-Lantinga and Pulo-Printian, and thence make for the Siam River.

Route for leaving the Siam Gulf.—Vessels from thence to the Southward generally leave Siam with the N.E. monsoon, and if they start for the strait of Malacca before the middle of September, may expect long passages. In this case, a ship should work along the coast as far as the reef near the Point Romania, so as to profit by the land winds, and in all cases to be ready to anchor in a convenient depth if the current obliges her to do so, which is often the case in October with strong Easterly winds. The current sets up the gulf along the Western coast. At all other times the rivers produce a current which takes an Easterly or S.E. direction, and vessels in the S.W. monsoon, at the entrance of the gulf, are frequently set twenty or thirty miles to the Eastward.

On leaving the harbour of Siam, in the N.E. monsoon, a ship should steer so as to be well clear of Cape Liant and its adjacent islands. Thence she should steer for Pulo-Way, and not seeing these islands should sight Pulo-Panjang, and even although she may have sighted Pulo-Way, it will be more prudent also to sight Pulo-Panjang, from whence she would steer for Pulo-Aor, if bound for the strait of Malacca or Banca.

On leaving the gulf of Siam with the S.W. monsoon, a vessel should work along the Malay coast if bound to the strait of Malacca or Banca.

If bound to China, Cochin-China, or Manila, she would follow the West coast of the gulf as far as Cin Point; from thence she would steer S.E. to sight Pulo-Panjang, and if not made, should tack to Eastward until it is sighted, it being almost indispensable to do so. In this route she would also be careful to guard herself from the effects of the Easterly currents, which are met with in this season.

(To be continued.)

The Red Sea.

Full often have I visited Suez in the course of my life, for it is difficult to avoid it when one has some connection with places in the Red Sea. Everything tends towards the head of that gulf, either going or coming, and absolute necessity seems to have created a town in the desert, and to have collected there every one who has any business in those parts. In fact, no choice is left, for any other route to Cosseir, Massuah, or neighbouring places is even more difficult. One must be resigned to Suez then, which is in itself unique; and one must submit to every inconvenience, which, however trying it may be, there is nothing left but to put up with it.

I shall not describe Suez, for it is well known; but I may speak of its progress, little as that may be. Its progress from this time will be in every respect worthy of the interest with which it is looked for, independent of that which is attached to the intended city at the mouth of the canal that is to cross the isthmus. One can scarcely conceive the bustle and activity going forward in this port, surrounded as it is by miles of arid sand. I assure you that the last time that I saw this place, in the beginning of the present year, I could scarcely believe my eyes. I was even astonished at the intelligence and energy of the people under the most unfavourable circumstances.

But in this letter I would refer only to the navigation of Suez, and that must be of course European. That of the natives is paltry, and I verily believe is the same as it was in the days of the Pharoahs. I shall therefore make no allusion to the hundreds of barges which they employ, but will treat of the magnificent steamers which about six or eight times in the month appear at the foot of the Attaka.

The statistics of navigation that have been communicated to me show a constantly progressing increase in the commercial relations of Europe with the East. Many persons have supposed that the insurrection in India and the maritime operations against the Chinese would check the progress which European commerce has made in these distant countries during the last few years. But no such thing. The amount of imports and exports together in the last half year of 1857 surpasses that of the preceding half year by the enormous sum of £2,616,431. There may be abundant causes for this increase,

but it must be mainly attributed to the necessity which all Europe finds in making up the late deficiency in its ordinary supply of silk. In fact, it is not unworthy of notice that the whole town of Shanghai, the trade of which is nearly entirely in silk, has been incessantly employed in supplying the demands for it from European ships. Canton was at war with England and France, but the rest of the celestial empire was not, and the North of that country has not felt the convulsion which has agitated the South.

This is a subject to which I may call your attention, and which in fact is well worthy of being pointed out, because it explains many things in this strife of western civilization against Chinese barbarism. When the interests of commerce are so clear it is not likely that political proceedings can materially affect them; and, according to appearances, the Emperor of China will not demand more, when the time has arrived, than to settle things amicably. The middle of the empire is not engaged in this strife, nor is there one town there that would take part in it.

But let us return to Suez. The Medjidieh or Egyptian Steam Navigation Company, which has just established a line between Alexandria and Constantinople, and which has especially the navigation of the Red Sea, has already despatched several vessels for that part of the world. Among other items it is certain that the Medjidieh will find the elements of much prosperity in the transit of the numerous pilgrims which visit Mecca, and in the transport of goods from Hejaz, Yemen, and Abyssinia. Navigation from Suez will therefore henceforth not be exclusively under the English flag, and will receive fresh impulse, and its importance will daily become more and more than it has yet been while only carried on by a few Arab craft. I have seen it in this its primitive epoch, and can assure you that already has the aspect of this barren place very much improved.

Steam navigation from Suez has even been more active in the last half of 1857 than in the first, as recent events amply prove. It is true that if the number of arrivals of ships and their tonnage has been greater, it has not been all due to the demands of commerce only, but to the transport also of 2,800 British soldiers sent by way of Egypt to India. Nevertheless, commerce has by no means suffered from this.

The value of the imports and exports together exceed the sum, as I have said, of two millions sterling. In analyzing this sum we find that £230,062 belongs to the trade of Marseilles. This is something as a half yearly increase for our beautiful port; but the remainder, that is, one million and three quarters, belongs to the trade of Southampton. The remittances of gold and silver sent from Europe to India and China, and the returns of raw silk from Calcutta and Shanghai for the markets of England and France, have been going on as in the preceding half year. To these must be added some of the Australian gold, the return of which has been going on with surprising regularity, and the returns in six months have reached the enormous sum of £2,632,183.

Such then is the importance of general commerce. The vessels employed are few. All the steam navigation going on at present at Suez is the attendance by the Medjidieh on ships with the British flag. It belongs, as you are aware, only to two companies, assisted by the British Government. These companies are the Australian and the Peninsular and Oriental. The Australian Company, recently formed, and of which you have often spoken in your valuable journal, was with difficulty got up, by reason of the insufficiency of its resources and the length of its lines of transit, to organise a regular return between Sydney and Suez. There have been frequent delays of even weeks, but in spite of misfortunes, the relations between the colony and the mother country increase rapidly, as you will perceive by the following.

Thus, in the three first voyages the Australian boats brought to Suez only £223,590 of gold; but it appears that the Australian merchants quickly discovered the advantages of the new service, and in the six following voyages the value of gold imported amounted to the sum of £1,472,030. You see then that if in the first half year of 1857 the mean value of every homeward freight was £74,490, it was during the second half year £245,339, that is to say, three times as much. This will not stop; this result is perfectly clear, and the complaints so often raised by British commerce finds here ample explanation.

But above all, it is important that the merchant's remittances should be certain in point of time and as quick as possible. He knows then what he can depend on, and can undertake engagements which he can perform. On the contrary, when passages are irregular and uncertain, as they are by the Cape for instance, he does not then know what he can do, and the most guarded speculations, as well as the wisest measures, may prove disastrous. Add to this, that the enormous sums embarked are losing a proportionate but ruinous amount of interest. Two months delay on £16,000,000, occasion a loss of no less than £100,000. This is worth while attending to, and hence the increase which has suddenly taken place, and which Australian gold will not fail to command by fast and regular packets.

As to exports from England to Asia, they consist for the most part of works of jewellery, and are nothing in consideration of the imports. The mean value of these scarcely varies, and does not show any signs of increase. It is much the same for the two half years.

We will now turn to some other details. By the Custom-House returns it appears that eighteen ships of the Australian Company, measuring together 36,740 tons, and with 8,910 horse-power, entered and left Suez in nine months from March, 1857, until the 1st of January, 1858, when the vessels of this company commenced running. These vessels have carried in the nine voyages 899 passengers, 8,021 cases for the post, and 1,147 packages, estimated at £1,652,946, declared value.

You will remember the mileage per hour required by the Admiralty: the following is what has been performed with the utmost ef-

forts. The mean voyage from Sydney to Suez has been forty-seven days, which is twelve days over the stipulated time: the quickest passage has been thirty-nine days, which was in April; the longest, fifty-six days, in August. But a mean of forty-seven will not do, for by the contract Melbourne to Suez was to be done in thirty-five days and Suez to Melbourne in thirty-nine days. The company must make very serious improvements, but it has been most difficult to fulfill the original contract, as was foreseen by the Peninsular and Oriental Company. This company would not undertake it, and left it to those who did so.

The proceedings of the Peninsular and Oriental Company were even more prosperous in 1857 than they were in the preceding year. The value of imports and exports on the manifests of this company, has attained the unheard of sum of £26,395,725. This exceeds that of 1856 by £6,216,021.

Let us cast an eye to Marseilles, and look at the share which that port has had in these proceedings. She comes in for £4,408,843. This is tolerably well, as you will say, to all appearances: but on closer consideration, this sum is to be separated as follows. Merchandize exported from France, £93,373; gold and silver exported from France £3,078,912; merchandize to France, £1,236,678, which amount to £4,408,972. Then as a part of the remittances of silver has passed through Marseilles, and must be deducted from the accounts of the port, the remainder which may be considered as belonging to Marseilles will not be more than £2,800,000, including everything.

In 1857, and for every year, twenty-four vessels of the Peninsular and Oriental Company have made voyages, arriving and departing, between Suez and Calcutta. There are twenty-one between Suez and Bombay; besides which, there are two more, which are not to be included as they came accidentally,—one from Aden, the other from Shanghae. Therefore, twenty-four steam-vessels have entered and left, making 107,760 tons, and 27,690 h.p. They have carried 9,257 passengers, 13,499 cases for the post, and 136,623 packages, making up the abovementioned sum.

The mean passage between Calcutta and Suez is about twenty-six days: the shortest was twenty-five, in October, and the greatest thirty, in August.

From Bombay to Suez the mean is a little over fifteen days; the shortest is eleven days and the longest twenty-one days, in August.

But, taking the whole year 1857, it appears that 111 steam-vessels (English), amounting to 144,500 tons and 36,600 h.p., have entered and left the port of Suez; that they have carried 10,156 passengers, 23,520 cases of letters, and 137,770 packages of merchandise or gold and silver,—the whole amounting in value to £28,248,670. This sum might even be increased if one of the Peninsular and Oriental Company's vessels, in consequence of injuries received in the course of the voyage, had not been obliged to stop at Aden. The consequence of this delay was that she could not discharge at Suez until December, 1857; and, moreover, that the merchandise for Europe

brought by this same vessel was not forwarded till after a delay of fifteen days; so that the value of it, which ought to have been included in 1857, will appear in the tables of 1858.

I think that these figures, which I have collected at Suez, are of a nature to interest you. I have observed that in your journal you pay special attention to everything that relates to commercial enterprise in the Red Sea, and particularly to Suez. I fully believe that you have good reason to prophecy favourably of its future commerce. One may boldly affirm that it is nothing now in comparison to what it will soon be. Suez is greatly improved since 1839, when the first steamboat of the Oriental Company came to it, after the occupation of Aden. But what will it be when the great questions of the East are decided? Even now the trade with China amounts annually to 800,000,000. fr.

And, again, European commerce is at present legally confined to five ports, and these 8,000,000 will be increased to ten times that sum when trade is permitted on all parts of the coast to find its way into the interior of the country, and we can deal with three or four hundred millions of consumers. It becomes, in fact, incalculable. Then to China add Australia, which is yet only in its infancy, but is making gigantic strides every year; and then, again, India, which, under a better system of colonization, will have three or four times the amount of commerce that it has at present. But I need not dwell on this subject. You know more about it than I do, and have shown it under different aspects in connection with your great enterprise. But the whole world may rest assured that it will be no mistake to direct its attention to the opening of the isthmus which separates the Red Sea from the Mediterranean; and I believe that the facts which I have mentioned are arguments sufficiently forcible, added to as many others. England is wrong in continuing blind to this necessity. She deceives herself and is blind to her own interests in universal commerce. Lost to reason now, she will sooner or later have to yield to the course of events.—*Moniteur de la Flotte.*

Railways in Egypt: Communication with India.—If the statistics of this pamphlet be correct—and we have been unable to discover any flaw in them—the railroad from Alexandria to Suez is as ill planned and as ill conducted as the most fervid Oriental imagination could suppose possible. Though labour is wonderfully cheap in Egypt, though a perfectly level line of country might have been found, and land was to be had for the asking, the Pasha has so contrived it that the transport of both passengers and goods costs vastly more than in England, where all these favourable circumstances are reversed. The gradients of the line at present under construction between Cairo and Suez are so steep that in some places four assistant engines will be required, and water there is none; so that "the train mileage for water traffic will always be five-elevenths of the train mileage of all other traffic." In the mean time, the most dreadful disasters have

taken place in laying down the line at such a distance from the precious fluid. Parties of several hundred labourers have been lost in the Desert searching for water, having missed their way to the Wady Toumeilat, or ancient Goshen, which is watered by a canal, and through which the line of railway should have passed.

If these blunders be sad and distressing to our human feelings, others are ludicrous, but equally distressing to our pockets. The classification of goods for transport, and the charges thereon, are such that we can hardly imagine any one but the celebrated simpleton Khusaib, who, according to Oriental writers, once ruled Egypt, to have devised them. Butter and eggs are charged 33 per cent. more than clocks, mirrors, and silks,—so that 2*s.* 6*d.* a pound must be paid for butter in Alexandria, though it may be got in Cairo for 7*d.* A merchant may send £400 worth of silk for the same sum to Alexandria that he can send 15*s.* worth of eggs,—and indigo, cochineal, or tortoiseshell, which is eight hundred times dearer than wood or coke, can be transported at the same expense. On the Madras railway a ton of cotton is carried for about ¾*d.* per mile, but in Egypt for 8½*d.* In short, one single fact is sufficient to prove the folly of the Egyptian railway regulations. It is this, the cost of transporting 5¼ tons of cotton from Alexandria to Cairo costs 8*s.* 6*d.* more than the carriage of the same from Alexandria to Manchester!—*Athenæum.*

THE JEDDAH MASSACRE.

The following letter from Alexandria, dated the 6th July, gives some details of the massacre, from the lips of the persons who had arrived there:—

About sunset, on the fifteenth of June, the house of the English Vice-Consul at Jeddah was suddenly attacked, and invaded by some hundreds of Hadramites (inhabitants of Southern Arabia), who seized the person of the Consul, wounded him grievously, and then flung him, still alive, from the window into the street, where a mob of the same fanatics hacked his body into pieces. The house was then pillaged; the servants and two dragomen assassinated, and the archives of the consulate were burnt.

While this horrible scene was going on similar crimes were committed at the French consulate. This Consul, also attacked by a band of fanatics, who penetrated into the house by the windows, fell mortally wounded by several sabre cuts. His wife was killed by a dagger thrust in her breast, after having defended herself courageously, killed the murderer of her husband, and wounded several others. Her daughter, eighteen years old, succeeded in escaping by a secret door. In the next room were the Chancellor of the consulate and his servant. This latter is a Mussulman, an old soldier, who formerly

served in a battalion of native Algerines. These two men and the Consul's young daughter defended themselves so heroically that the murderers retreated for a moment. They soon returned to the charge, but this time employed a stratagem. A Hadramite, an acquaintance of the Chancellor's, approached him, and said, "Come out. Come with me. I wish to save you from certain death." Confiding in these promises, the brave young man quitted the room. He was instantly struck with a poignard, which only slightly wounded him in the arm. Knocked down by the blow, his throat was seized by the assassin, and he was on the point of perishing when the Consul's daughter threw herself on the assassin, and bit him so deeply in the hand that he was forced to let go. Thereupon another of these wretches attacked the courageous young girl, and gave her a sabre cut across the face. She fell senseless, but the Chancellor, who had sprung to his feet, inflicted a blow on the last assassin. Meanwhile, the Chancellor's servant, struggling with admirable energy against these miscreants, killed three of them, wounded several others, and so succeeded in covering the flight of the Consul's daughter, of the Chancellor, and of a servant, who have all arrived this evening, in company with the brave soldier, at the residence of the Consul-General of France, in Alexandria.

While this carnage was going on all the Christians were assailed in the streets of Jeddah and massacred. Twenty-three persons succeeded in escaping under cover of the night, and throwing themselves into the sea, swam to the English steam despatch boat which was at anchor in the port. All the other Christians, to the number of forty-five, have been killed and hacked in pieces. In the house of the brothers Sava twelve persons, including the three brothers, have been murdered.

The number of Mussulmans who took part in the massacre is estimated at five thousand.

Jidda is built along the shore in the form of a parallelogram, extending almost due north and south. From the sea it has a poor appearance; only a few minarets rise above the houses, which present a long line of mean buildings. From the sea there is no entrance except through the shabby irregular courts of the custom-house, which are littered with lazy *employés* and bales of coffee and gum. The gate is at the end of a wide street, one side of which is occupied by a palace built by the former Sheriff Gholeb, and is lined on either side by a dark row of coffee-booths, which are filled from morning to night with crowds of idlers, all smoking the nargileh. The bazaar, principally composed of wooden booths, runs almost at right angles to this street, leaving in the centre only a narrow passage often obstructed by camels and their loads, which they deposit before the entrance of the okels. The okels are all placed in this quarter, rendering it no easy matter to pick one's way through the masses of merchandise around them. The shops are poorly furnished

—more than one half of them retail eatables; the rest of them display coarse china, porcelain, or European earthenware—the venerable willow pattern predominant on the English wares—cottons, coarse abayahs, cornelian beads and rosaries. Two or three shops sell Indian and Syrian silks. The crowd which fills the street forms a most interesting sight, on account of the number of different races whose representatives compose it—Turks, nomad Arabs, Meccans, Persians, Affghans, Indians, blacks of every shade, with features varying from the Jewish to the Negro type. Behind the bazaar lies the town, composed of tortuous and narrow streets, in which are a few houses with curiously carved lattices and beautiful doors of teak; the greater number, though lofty, are externally mean, and in their interior confined and shabby.

Of all the towns in the East none has so distinctive a physiognomy as Jidda; it is even more oriental than Damascus, though as striking for its ugliness as Damascus for its beauty. A single Greek mercantile house, the keeper of a wine shop, and an Armenian broker, are the only Christians in the place. A most unpleasing sight to the English eye are the crowds of poor Indians who litter in the streets like dogs. These Indians are pilgrims who have returned here from Mecca, but being destitute of means to continue their journey, live on alms a life of squalid idleness. According to the most probable calculation, the number of houses, large and small, may be about 4,000, and the population perhaps reaches 20,000. Of the present population (1854) 1,500 are Indians, including many of the wealthiest merchants, nearly the whole trade of Jidda being in the hands of British subjects.—*Hamilton's Sinai.*

ADEN.

Aden is now so much frequented by persons going to and coming from China, India, Australia, &c., that it will not be uninteresting to consider this very important port.

Aden was formerly a very flourishing town, the mart for Asiatic and African produce, until it was destroyed by the Portuguese in order that it might not monopolise their trade by the Cape of Good Hope;—abundant proof of which assertion may be found in those magnificent works which have come to light during the last few years. Only three years ago the English discovered the first of those cisterns in the defiles of the mountains South of the town, and they have now completely opened thirteen, which would contain about 3,500,000 gallons of water. Thirty-six others have also been discovered, which are calculated to contain nearly 12,000,000 gallons,—one of them alone contains 4,000,000.

On contemplating these gigantic reservoirs, the visitor is struck by the preservation of the cement used for plaster. This cement is a

kind of mortar containing a large proportion of volcanic stones pounded very small, in order that the cisterns may appear to be faced with granite.

The visitor descends by steps to the bottom of these cisterns, the depth of which varies from ten to fifteen feet; and aqueducts enclosed in the thickness of the walls conduct the water from one to the other.

The care and ingenuity with which every ridge in the mountains has been taken advantage of, is especially to be noticed, for leading water into the valley, pipes in brickwork are found in all directions. Every fissure in the ground is carefully bricked up in order that not one drop of the precious water may be lost, which was wanted as much then as now by the inhabitants of this arid country.

These cisterns were also a safeguard against inundations, caused by torrents of water which sometimes descend from the mountains into the valley where the town of Aden is situated. A sort of dyke has been constructed to carry this water beyond the town; but the cisterns form a much better protection, and supply at the same time what is so greatly needed.

Should an inundation take place at Aden, the people would be thankful for a disaster which would supply them with water for a year or two, instead of that brackish and detestable liquid which they are obliged to use.

The huge scale of these reservoirs evidently shows the former wealth of Aden, and also that the people must have formed them for their own use.

Nothing is left undone in order to render this place, which is made almost impregnable, a vast commercial mart; but on this point the progress has not been made that might have been expected.

Since 1839 Aden has been a free port, where the dues are so extremely small that two houses can hardly succeed there now in loading three or four vessels every year with coffee, gum, incense, ivory, &c. The house of Rabaud is one of these, and has a competitor in an English company. The coffees from the interior are heavily taxed by all the sultans and chiefs through whose territories the caravans have to pass, and the bugalows of India prefer going to Moka and Hodeidah in the Red Sea, because they find there a cheaper market.

However, at Aden much business is going on. Every fortnight, two steamers of from 400 to 500 horse-power arrive at Suez, stop twelve hours in harbour to coal, and then start for Bombay or Calcutta; while two other vessels are leaving these capitals of India, and are on their way to Suez, both carrying mails and passengers. Eight steamers, therefore cross the harbour of Aden every month, and another company also sends a ninth vessel, connecting Europe with the Mauritius and Reunion. There is also the Australian company, whose vessels, leaving Marseilles, will go to Aden, Ceylon, and Melbourne. To all these add the English sailing vessels, the American merchant ships,—clippers from 1,000 to 1,200 tons, which carry the coals requisite for the different steamers, consuming about 4,000

tons of fuel a month, and we may form some idea of the busy work going on in the harbour at Aden.

But the most difficult and essential point has been to secure a constant supply of good water at Aden; and this indispensable want has been provided for by repairing the ancient cisterns of the Portuguese, abovementioned, and by forming others.

REPORT OF THE HARBOURS OF REFUGE COMMITTEE:—*appointed 8th of February*, 1858; *and ordered to be printed 17th of June*, 1858.

The Committee commence their report with a general view of the enormous increase of British and foreign tonnage frequenting our ports, which increase they show to have been clearly one hundred and thirty-six per cent, in fourteen years, or from 1843 to 1857: that the increase of vessels built in the same interval, is about two hundred per cent., and the number of masters employed in 1849 compared with that of 1857, is increased by 23,776:—that these several proofs of our commercial activity are still accumulating year by year, and therefore require that "an effort should be made on public grounds to afford the greatest possible security to our shipping." Such increase of shipping brings with it an inevitable result thus alluded to by the Committee—"that the more crowded the waters around our shores become by increased traffic, the greater must be the risk of accidents from collision and otherwise, and the more urgent must be the necessity for greater accommodation and provision for safety."

These are stringent reasons for the Committee to proceed upon, but there is still another powerful appeal to their consideration. Inevitable as the accidents from such causes are, no less inevitable is the loss of life and property incurred by them. Since the appearance of the earliest volume of this work (1832) the loss of life and property at sea has been a subject to which we have been always keenly alive. Our tables of wrecks were then commenced, and have been kept up in each annual volume until the subject became one of the duties of the Board of Trade. The fearful amount in loss of life and property could be estimated from the number of wrecks which we registered in some years as amounting to three whole ships in two days, or a ship and a half daily. And by the report before us this is no exaggerated amount. The report says,—"The total ascertained losses from all causes, therefore, amounted to 2,184 vessels, (in five years 1852 to 1856,) or at the average of nearly 437 in each year. The total reported loss of life connected with these casualties, was 4,148 persons, or upon an average of five years nearly 830 in each year. In 1854 the loss of life amounted to no fewer than 1,549 persons. The value of the property lost by total wrecks, is estimated by Capt. Washington

at £1,000,000 a year at least, and by other losses and casualties at £500,000, making together £1,500,000 as the annual loss to the country from these casualties on our coast." The loss of life and property is thus established by the Committee arising from wrecks and collisions at sea at 830 of the former and £1,500,000, independent of that connected with the fisheries.

With these tangible and serious facts before them, the Committee proceed with their business at once, and drawing a distinction between trading ports and ports of refuge, refer directly to our sea coasts and select "the most dangerous portions, * * * where works of a national character are necessary and practicable." This looks like business, and we rejoice to see that the source of so much loss of life and property is in a fair way of being removed. It has long been a monstrous evil lying at the root of our maritime supremacy and commercial prosperity, and we hope to find that no local interests or prejudices have been allowed to prevail in the councils of the Committee, but that proper harbours have been at least recommended by them in proper places.

To secure this most desirable object, the Committee proceed to consider the dangerous portions of our coasts, which they consider to be,

First.—That part of the East coast of Scotland extending from the Pentland Firth on the North to the Firth of Forth on the South.

Second.—That part of the East coast of England extending from the Fern Islands on the North to Flamborough Head on the South.

Third.—That portion of the West coast of England extending from the Land's End to the South coast of Wales, and including the Bristol Channel.

Fourth.—The points on the coast of Ireland to which reference has already been made, and one point in the Isle of Man.

"Independent of the three great works now in progress at Holyhead, Portland, and Dover," the Committee then proceed to point out the works which they are of opinion are "most urgently required" in the several districts of coast above-mentioned. And—

First—"The East coast of Scotland."

There appear to be three places named on this coast by the Committee as favourable for the construction of a harbour of refuge, consisting of Wick, Peterhead, and Fraserburgh, and they say "the majority of evidence is, however, in favour of Wick, with reference especially to the fishing trade." We must not stop now to look into the pretensions of these different places as to being chosen for harbours of refuge. They are so widely apart both in position and in those conditions which are so essential to a harbour of refuge, that we shall proceed at once to state the several places mentioned by the Committee in the districts abovementioned, and apply the principles of refuge harbours to them hereafter in reference to their fitness for that all important place. The next is—

Second—The North-East Coast of England.

The "earliest consideration" is claimed by the Committee for the dangerous coast between St. Abbs and Flamborough Heads, one to which we have too often had occasion to allude in the *Nautical*, including, as Capt. Washington observes, "the focus of wrecks on the East coast of England." "Some part of Tees Bay" and "Filey Bay" are therefore pointed out by the Committee as the site where "a harbour of refuge on this part of the coast, of dimensions suitable to its large and rapidly increasing traffic is urgently required."

Third—The coast from Land's End to Hartland Point and the Bristol Channel.

This portion of coast is separated by the Committee into two parts. On the coast from the Land's End to Hartland Point two places are strongly recommended—St. Ives and Padstow; and in the Bristol Channel, the Mumbles Head, Lundy Island, and Clovelly. In reference to the coast containing St. Ives and Padstow, it is stated by the Committee that the vessels frequenting it are principally small coasting vessels. "On the other hand, the Bristol Channel is frequented by foreign going ships, rapidly increasing in number, and of large tonnage." They add, also, "that any place which is finally determined upon for affording refuge to ships frequenting the Bristol Channel, should have special reference to the rapid developement of the coal and iron fields of South Wales and to the increasing sea traffic which is arising therefrom." Hence a spacious harbour in a convenient position for access and departure is that required.

We now come to the last and

Fourth—The coasts of Ireland and the Isle of Man.

The points selected on the coast of Ireland are Carlingford Bay, the Skerries near Portrush, Waterford, and Wexford. Carlingford and Waterford are stated to have peculiar advantages; but doubts are expressed of Wexford. "With regard to the Skerries, Portrush, on the North coast, the circumstances are very peculiar," say the Committee, and that "the facilities for making a first class harbour of refuge at this point, [Skerries,] are ably and clearly pointed out by Sir John Burgoyne" and others, and that it is "a work well worthy of favourable consideration."

"With regard to the Isle of Man, (they continue) Capt. Washington speaks of it as 'the beacon of the Irish Sea,' and is of opinion that a small harbour of refuge is required to be constructed outside the present tidal harbour of Douglas." Port Erin has also been pointed out to the attention of the Committee.

The foregoing embraces the several points mentioned by the Committee, who leave to nautical men the determination of the precise places, as well as the particulars of formation respecting the harbours themselves, which, with the *estimated* expences, they sum up in the following statement.

"10. The various works which your committee has thus enumerated as being needful purely or mainly for harbours of refuge, and which appear to it to be of a character which can only be executed as national public works, and as such, under the direction and control of the Government, are:—

A harbour of refuge on the North-East coast of Scotland, estimated to cost from £80,000 to £335,000, according to the site that may be selected.

2. A harbour of refuge on the North-East coast of England, at an estimated cost of from £800,000 to £860,000.

3. An extension of the present harbour of St. Ives,—[we are at a loss to understand what the Committee mean by "an extension of the present harbour of St. Ives." What engineer could possibly have so misled the Committee as to induce them to suppose that the present miserable shelter for a few fishing boats is capable of being *extended* to an efficient harbour of refuge? Surely the Committee must mean the *construction* of a harbour at St. Ives,]—at a cost of £176,000, or if Padstow is adopted, at a cost not exceeding £35,000.

4. A harbour of refuge at the Mumbles, or at some place in the Bristol Channel, at a cost of £300,000.

5. An improvement of the harbour at Carlingford, at a cost of £20,000.

6. An improvement of the harbour at Waterford, at a cost of £20,000.

7. The construction of a harbour of refuge at the Skerries, Portrush, at a cost of £100,000.

8. A pier in the Isle of Man, at a cost of £40,000; making a total not exceeding the sum of £2,000,000; or if spread over a period of ten years, at the rate of £200,000 a year.

THE CAGLIARI RESTORED.

The last act in a great triumph over injustice and cruelty has been taken. So far back as the 9th of June Captain Sitzia and the rest of the crew were informed by the Procureur-General that their speedy liberation was probable. On the 10th they were told that it was a fact: and it is not easy to describe the joy with which such an intimation was received by men who had suffered so long and so unjustly. With every desire, however, on the part of Mr. Lyons to give effect to the concession of his Sicilian Majesty, there were some difficulties as to form, and the British and Sardinian Governments were both telegraphed to for further instructions. The result was, that on Wednesday, the 16th of June, the *Cagliari* was given up by the Neapolitan Government to Mr. Barbar; and a corporal with three marines took possession of her.

On the 17th an officer of the *Centaur*, Lieut. Telfer, and a boat's crew, went on board and brought her out of port, anchoring her off

Santa Lucia, one of the most conspicuous spots in Naples. At four in the morning of the 18th, the *Centaur* got up her steam and started for Salerno, where she arrived about ten o'clock. From the immense crowds assembled it was easy to see that she was generally expected; in fact, Mr. Barbar had gone down the night before to receive the prisoners formally from the hands of the Attorney-General, and it was a gratifying and a proud sight to witness the procession of these unfortunate men, headed by one man with no other prestige than that of the British name and authority, coming down from that den of suffering, and taking his companions to freedom under the British colours.

Notwithstanding the jealousy of a Government which is ever ready to interpret every act or look into a hostile demonstration, immense crowds were assembled on the occasion, and a very strong military force was on the spot, as it was fully expected that the Salernitans would not have refrained from some political demonstrations. All however passed off quietly; not a voice was raised, and in a short time the captain and his crew were transferred to the *Centaur*, where they were received with every expression of sympathy and kindness. "Thank God!" exclaimed the captain, "we are under British colours. Oh, what have we suffered. They stripped me of my clothes without respect to my age. You have no idea of the indignities which have been practised towards me." From the time that they were informed of the probability of their liberation until the 18th inst., not the slightest change was made in the rigours of their treatment. Though nominally liberated, they were still treated as prisoners.

Whilst preparations were being made for leaving Salerno, some persons came on board to visit the quondam prisoners, and a crowd of boats continued to ply around the steamer. As a *coup d'œil* it was very grand, and the moral of the spectacle was yet grander, for it spoke of the security and protection which are accorded to their humblest subjects by constitutional states. When will a despotic state be ever found to put itself forward in antagonism to oppression?

About twelve o'clock the *Centaur* left Salerno, arriving in Naples soon after five o'clock in the afternoon. It was known where she had been, and whom she had brought up, and Santa Lucia was crowded by persons anxious to catch a glimpse of the Sardinians. At seven o'clock in the evening an interesting ceremony took place. Captain Sitzia and his crew were transferred from the *Centaur* to the *Cagliari*, and put in possession of their old ship. No flag, however, was hoisted as yet, nor were the crew permitted to land during the remaining time that they stayed in Naples. From the city the vessel presented a spectacle which attracted the attention of thousands of curious spectators. For many a month had the *Cagliari* been lying within the Military Port, just at the back of the King's palace, where his Majesty could, on occasion of his "angel's visits" to the capital, feast his eyes on this, one of the great triumphs of his vast naval power. Now she was anchored off, under the protection of the British guns. I have made some inquiries as to her size and condition, facts which will possess some interest for the reader. Her length is 195 feet, and 15 feet

8 inches in the beam; she carries 580 tons, and is of 60 horse-power; besides the captain, there were eighteen hands on board, one of whom, poor Fromento, it is feared will not live long to enjoy the liberty so recently secured, and for which sickness had made him pine for now so many months.

As to the state in which the vessel was found, I speak on authority when I say that it was in a very neglected condition. The *Centaur's* carpenters were employed for two days in putting her to rights, caulking the boats, refitting the rigging, and bending the sails; the traps of the sailors were completely destroyed, the awnings and sails were rat-eaten, and everything thoroughly soaked with water.

On the evening of the 18th, the captain and two mates dined with the officers, and toasts were given in honour of the sovereigns of the two allied States, of congratulation to the prisoners, and wishes expressed for the strong union and friendship of Great Britain and Sardinia. Up to this time, the *Cagliari* had not hoisted any flag. On Saturday she cleared out; late in the evening she procured her bill of health, and on Sunday morning, at six o'clock, she left the port of Naples, which she entered a year ago within a few days, the Sardinian flag flying at her peak.

It is a graceful act on the part of our Government in having sent up Mr. Barbar, who has taken so prompt and energetic a part in this trying affair, to deliver her up to the Sardinian authorities. On the arrival of the crew in Naples, the Port Admiral acknowledged the courtesy of Captain Clifford in going down to Salerno for them, intimating the great difficulty there would have been in bringing them up by rail.

Thus ends—for the present at least, as there are still some outstanding claims—what has long been known as the Cagliari business. That what has now been done might have been done sooner, and with great advantage too, there can be little doubt; for although the character of a bully little becomes a great nation, still forbearance may be carried to a criminal extent. Nor was the long delay which has intervened occasioned solely by forbearance; it can only be described as a species of paralysis originating in ignorance of the facts of the case, or in deference to that power which overshadows Italy. Better late than never, perhaps, and it is the subject of great exultation amongst British subjects in Naples, that so wise and just a step has been taken as that of supporting the young free state which is fast shooting into vigorous existence. It has conciliated much the public opinion of this country to England, which has unhappily gained the reputation of being a traitor to liberty,—whilst it will have given a moral strength to Sardinia, which will be productive of the best results. Sardinian vessels on passing the *Centaur* have dipped their colours, the best feeling exists between the subjects of the two countries, and the influence of Sardinia for good in this peninsula is doubly increased by the unity of action on the part of England. Through Sardinia must Italy be saved and elevated in the scale of nations.

What is to be said of Naples in this affair? Perhaps the least said

the better. An attempt is made to represent England as the wolf, Naples as the lamb. God bless the poor little pet. Look how subdued its expression, how gentle are all its antics. Thus amongst the followers and friends of the court the recent energetic act of the British Government is looked upon as little less than an act of piracy.

To-day the appeal case "In re *Cagliari*" is again to be discussed. The Government still maintains its position as one of law against might, and it is whispered about that in the event of the proceedings being declared strictly legal, the King will pay out of his privy purse the value of the *Cagliari* to the captors. It will be a politic step if his Majesty does so; and, in fine, it will be in accordance with strict justice, as his Majesty had no right to dispose of the *Cagliari* after having thrown the question into the hands of the magistrates.

The *Genoa Gazette* announces that the *Cagliari* arrived in the port of Genoa on the 23rd, under the command of Captain Daneri. Dr. Smith and Mr. Barbar, the British Consul at Naples, were on board, the latter having come for the purpose of consigning her to the Sardinian authorities, which he did immediately on his arrival. On the following day the *Cagliari* was delivered up to Messrs. Rubattino and Co., the owners. The *Corriere Mercantile* states the vessel was commanded by Captain Sitzia, (who had been arrested by the Neapolitan authorities,) and not by Captain Daneri. Both the former and the seventeen men forming the crew, were in good health. A great number of boats surrounded the steamer on her arrival, and as soon as permission was given to get on board, her decks were crowded with the relatives of the men and other visitors.

NAUTICAL NOTICES.

LIGHTS OF THE BALTIC AND GULF OF FINLAND.

A notice from the Hydrographical Department of the Russian Minister of Marine informs mariners that during the present year all the lights of the Baltic, from that of Lyser Ort, in the West, along the southern shore of the Gulf of Finland to Hogland, comprising also those of the Gulf of Riga, will be lighted during the summer nights from the 28th May to the 13th July, a period in which by the old regulations they were never before lighted. The same measure will include the lights of the Gulf of Finland from Hogland to Cronstadt.

Sourop light, which is under repair, will not be included in this order for the appearance of the lights during the above two months.

The present regulation will include the lights on the North shore of the Gulf of Finland, and those of the several rocks from Glosholm to the Aland Islands, excepting Lagskar, which is under repair.

Two new lights will also be established this year, viz.:—

A fixed red floating light on the Kalbaden Grund, situated to the

southward of Glosholm light. The light will be placed on the mainmast of the vessel and formed by eight lamps. During the day she will carry a yellow flag with a blue cross, similar to that shown by other light-vessels. In foggy weather a bell will be tolled every three seconds for twenty minutes, an interval of ten minutes rest will then follow, and the bell will be again tolled every three seconds for twenty minutes more, followed as before by ten minutes of rest, and this alternate tolling and resting will continue while the fog lasts. The other new light consists of

Three fixed floating lights on the bank of Revel-stein. The vessel will have three masts. She will be moored on the North side of the bank Revel-stein, to the North of Revel, each mast bearing a fixed light formed by eight lamps. In day time she will carry a yellow flag with a blue cross at her main, and in foggy weather her bell will be rung every five minutes.

A future notice will announce the time when these two light vessels are at their stations.—*Moniteur de la Flotte.*

Particulars of Lights Recently Established.

(Continued from p. 381.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
44. Cavoli Islet, C. Carbonara	Sardinia	39° 4′ N., 9° 31½′ E.	R.	242	25	Eclipsed every minute.
45. St. Helier	Jersey	Victoria Pier	F.	31	6	White }
		Albert Pier	F.	15	3	Red } Est. 18th July. Harbour
		Old North Pr	F.	17	3	Blue } lights. Shown all night.
		Uppr. P. Road	F.	46	3	Red }
46. Port Zebu	Pt Dapdap(?) Zebu Isl.	Phillipines	F.	50	4	Harbour light.
46. Port Romblon	Point Sabargo, Romblon Islnd.	Ditto	F.	..	..	Harbour light. Four beacons, lighted at night, mark the extremities of the reefs within the port.
47. Rio de la Hache	La Hache church twr	11° 33½′ N., 72° 59½′ W.	F.	69	6	Harbour light.
48. San Francisco Bay	.....	.....	..	..	..	Bell boat moored just outside the bar. The bar buoy on same line is removed, and the fog gun signal at Point Bonita is discontinued.
49. Kokskar	Gulf of Finland	59° 41½′ N., 25° 1½′ E.	F.	100	15	Lighthouse reconstructed. Lighted 27th May. Floating lights on Kalbaden Grund and Revel-stein.
50. Port Jackson	Sydney, Australia	Inner South Head	F.	60	15	Est. 1st June. Lighthouse 30ft. high, red and white striped vertically.
Ditto	Ditto	Fort Denison	F.	..	..	Red harbour light.
51. Liverpool Bay	.....	.....	..	..	..	Formby light-vessel and buoys in the approaches changed in position.
52. Bressay Sound	Shetland Isl.	Kirkabister-ness	R.	105	15	Est. 30th Aug., '58. Red and white alternately every minute.
53. High Whitby	England, E. coast	54° 28′ 40″ N., 0° 34′ 10″ W.	F.	249	23	Est. 1st October, '58. Two lights N.b.W.¾W. and S.b.E.¾E. 258 yards from each other illuminating seaward between N.N.W ¼W. and S.b.E.¼E., showing over North Cheek of Robin Hood Bay. In line lead on Whitby Scar.

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

The usual notice of the fixed light at the flagstaff on the North side of the entrance of Trincomalee Harbour, on the North-East coast of Ceylon, says it is visible from N. 15° W. round easterly to S. 55° E. These bearings if followed would lead into danger. The mariner therefore is cautioned when approaching from the northward not to steer for the lights on a bearing to the eastward of S.¼ E., and when closing from the southward not to bring the lights to the northward of N.W.b.W.½ W. magnetic.

The small fixed light at the pier of La Guayra, the port of Caracas, on the coast of Venezuela, is no longer exhibited.

Notice to Vessels Bound to Havre.

With the view of preventing accidents to vessels entering the port of Havre the captain of the port has established the following:—

While the national flag is not hoisted, or while another flag is flying instead of it, ships should not approach the port without being able to stand off it again when necessary.

The following signals will be made at the flagstaff on the northern pier for the entrance and departure of vessels of the transatlantic company and ships of the state:—

No. 1.—*A red flag.*—To enter the port is impossible.

No. 2.—*A blue pennant.* / *A red flag.* } Sailing ships of all kinds and small steamers are not to enter. Large ships and steamers of the transatlantic company may enter.

No. 3.—*Red flag.* / *Blue pennant.* } No ships of any kind are to enter, nor are any ships to go out, the entrance being blocked up.

No. 4.—*Blue pennant.* / *Blue pennant.* } The officers of the port not to go out, nor to make any movements whatever.

Bournichau.

Havre, 18*th June*, 1858.

River St. Martin de la Arena,—*Spain, North Coast.—Notice on the Ports of Suancès, Requejada, Saint Martin de Inojedo, situated on the same river, named on the charts Saint Martin de la Arena, twelve miles from the light of Santander, and the Isle Suancès, a steep rock visible fifteen miles from sea.*

St. Martin de la Arena is on the starboard hand and situated on a high mountain. A church is seen at a distance which may be distinguished by a square tower upon it. A ship having passed about two miles up the river, should anchor at Suancès, where she will be boarded by the custom house boat. If the ship brings cargo she may continue on as far as La Requejada, the port of discharge for corn and railway iron. Spanish coasting vessels from their ports also convey there iron, coal, and timber; but this port is not open to foreign ships, nor Spanish either, with any other cargo than these articles.

Those ships that come from the eastward are obliged to discharge ballast at Suances.

La Requejada is situated on an arm of the river about 250 yards from the high road between Santander and Castile. It is a little village with large magazines for storing up corn, and has scarcely two dwelling houses in it. It is situated on the right bank of the river. On the left bank is St. Martin de Inojedo, and between them is an island formed by the two arms of the river.

A considerable quantity of mineral is shipped at Requejada, and very little at St. Martin de Inojedo, where not more than three ships are loaded. Vessels for this river should not draw more than ten feet, although those drawing twelve and thirteen may go up to Grand Malines.

Comillas.—This port, situated twenty-four miles West of Santander light, has hitherto had the character of being insecure. In fact, the sea which falls into it with N.W. winds renders it dangerous for ships lying at anchor there. But the persevering exertions and care of Messrs. Chauviteaux and Co. proprietors of the mines of Calamine, Comillas, and other places, have remedied all that. This company has improved the port at a considerable expense, and on the least disturbance of the sea a gate is closed in a few minutes which shuts off the sea at the entrance of the port, and annihilates all effect of swell that it produces. This port is formed by timbers cut evenly, and which by a chain passing over a strong crane are let down in two parallel grooves, and thus form a barrier to the sea. And thus any vessel not drawing more than ten feet water may load here in security since May last, the period when they were completed. A ship may be loaded in the course of a tide in one day. Navigators have no difficulty in making the port, which is twenty-four miles West of Santander light, and five miles East of Cape Ovambre.

A vessel having arrived off the port by those bearings should lay her head to the S.W. and stand off and on in the bay, where some red land will be observed to port; it is there where the mines are situated, at a mile or a mile and a half away. But inside of the rocky point to port two strong buoys will be seen, to which vessels may make fast until they receive a pilot or till the tide enables them to enter the port.

San Vicente de la Barquera —This is an excellent port for vessels drawing ten or twelve feet, frequented by transports of the Spanish Government for timber for the arsenals of Ferrol and Carraca. It has two entrances—one to the East and the other to the West of the island. This port is improving every day under the operations of the Chauviteaux company, which are continually carrying on. The anchorage in it is everywhere good, and by its two channels of entrance it may be readily left.

WRECKING ACT—*Bahamas—of 1st July*, 1858.

The saving of merchandize and other property from vessels stranded among the Bahama Islands having found employment for a large number of vessels, a code of laws has received the final assent of the Bahama Parliament, enacting certain regulations by which they are to be guided in future, of which the following are the real objects. It is enacted by the

First.—That all vessels so employed shall be duly licensed under the hand of the Receiver General and Treasurer of the Colony according to the forms A and B, which licence will continue in force for one year, the vessels and boats being numbered,—but unlicensed vessels and persons may assist where the number licensed proves insufficient.

Second.—That such licences may be issued by the junior clerk of the office

of the Receiver General, care being taken that the party so licensed is not disqualified under any other provisions of this act.

Third.—That persons so licensed shall enter into a bond of £200 that the vessel shall not leave the Bahama Government without duly clearing out or having the usual clearance or passport, under forfeiture of the bond in case of not having done so.

Fourth.—That a penalty of ten pounds will be incurred by the master of any licensed wrecking vessel who shall employ any unlicensed person in his vessel.

Fifth.—That no master of a wrecking vessel shall employ any man on board without a written agreement in accordance with a form prescribed by the act of assembly passed in the 2nd year of her Majesty's reign.

Sixth.—That the master of any wrecking vessel on arrival at his port of entry having wrecked or stranded property on board, shall exhibit his wrecking articles and licence of his crew at the Receiver General's office before landing any of his cargo.

Seventh.—That such licences of persons as aforesaid shall be taxed at the rate of four shillings for each licence, as well as vessels and boats on a graduated scale according to size: thus, for every boat not exceeding

5 tons and under	.....	8	shillings.
5 ,, and not exceeding 20	.....	12	,,
20 ,, ,, 40	.....	25	,,
40 ,, and upwards	.....	40	,,

Eighth.—That masters or persons employed in wrecking vessels shall not enter into partnership with any other master or persons of wrecking vessels except in accordance with the principle of sharing as follows. To every vessel or boat

Under 10 tons and crew of	5	5	shares
,, 15 ,, ,,	6	6	,,
,, 20 ,, ,,	7	7	,,
,, 25 ,, ,,	8	8	,,
,, 30 ,, ,,	9	9	,,
,, 40 ,, ,,	11	11	,,
,, 45 ,, ,,	12	12	,,
,, 50 ,, ,,	13	13	,,
,, 55 ,, ,,	14	14	,,
,, 60 ,, ,,	15	15	,,
,, 65 ,, ,,	16	16	,,
,, 70 ,, ,,	17	17	,,
,, 75 ,, ,,	18	18	,,

and one additional share for every 5 tons, provided one additional man is carried for each additional 5 tons.

Provided that for vessels as above carrying a less number of licensed men than provided according to her tonnage the shares shall be reduced accordingly —and being laden with other cargo than wreckage, a reduction shall be made according to space occupied by such cargo—and provided that a greater number of men are carried than as above assigned, such excess shall not entitle the owners and others to any increased number of shares of salvage earned in consortship.

Note.—The master is in all these cases to be as one of the crew.

Ninth.—That any agreement by which a vessel is considered as having more shares than she is entitled to as above shall be void.

Tenth.—That to render agreements of consortship as above valid and effectual, the consort vessel must be present at the scene of the wreck or where stranded goods are found, the absence of such consort rendering such agreement null and void.

Eleventh.—That licensed boats or vessels shall carry a flag with the letters L. B. or L. V. (18 inches long) on a white ground when approaching a wreck or stranded vessel, (or on returning to port with wreckage on board,) and shall keep such flag flying while such wreckage remains on board under penalty varying from 5s. to £5. And every row boat to be similarly distinguished with letters in the bow.

Twelfth.—That every master of a licensed wrecking vessel shall have in his possession such licence of his vessel and crew, and shall exhibit the same when required on penalty of 5s. to £1 for refusal.

Thirteenth.—That the master of any licensed vessel first on board of any wreck, (or if two board her at the same time, then the master of the wrecked vessel shall decide,) shall be styled the Wreck Master, whose duty shall be to conduct the proceedings of the salvors in conjunction with the master and crew of the wrecked vessel, and be obeyed in all respects; and any person disobeying or committing any act of violence or using any threat against his authority shall be fined not less than £10 nor above £100, or to imprisonment for any term not exceeding six months,—and disqualified from holding a licence as hereafter mentioned.

Fourteenth.—That the wreck master shall select from among the licensed wrecking vessels present at the wreck, a commodious vessel to convey the passengers, officers, and crew of the wreck, with their effects, to any place of the Bahamas which the master of that vessel may point out,—and the wreckers shall be entitled to salvage to be estimated according to the size of the vessel so employed,—to be paid from the wreck prior to all other claims for salvage.

Fifteenth.—That any wreckage kept on board the wrecking vessel or any other after the master has made his report to the proper officer of the Revenue Department, shall render that master liable to a penalty not less than 5s. nor more than £5, unless he can prove that such detension was without his knowledge when he made his report.

Sixteenth.—That no wreck property so found as abovementioned after report of the wreck master shall be forfeited unless the owner thereof shall have been cognizant of such detention,—but shall be returned to its owner without fee or charge.

Seventeenth.—That persons debarred from commanding or serving in wrecking vessels shall forfeit all shares to which they would be otherwise entitled if found serving in wrecking vessels duting the period of their disqualification.

Eighteenth.—That in saving from wreck or from a stranded vessel the wreck master shall see that no impediment is occasioned by the crews of the wrecking vessels in saving the cargo; but that only as many as are proper haul alongside at once, priority being given to the order of arrival,—and that property shall not be landed unless there are no more wreckers than are laden. But this shall not apply to goods found derelict.

Nineteenth.—The wreck master not to allow persons to press on board, using force to prevent them if necessary, any persons molesting or hindering him shall be fined on conviction a sum not less than £1 nor more than £10, with imprisonment not exceeding three months,—provided that the efforts made in endeavouring to save the vessel prove ineffectual. And if it should become necessary to take out the cargo of the vessel and additional aid be required, then all wrecking vessels shall be permitted by the wreck master in the order they may have come to haul alongside and to obtain cargo until all be saved.

And if the wreck master refuse permission to do so, he shall forfeit on conviction before a justice of peace a sum not exceeding £50, and in default of payment be imprisoned for any period not exceeding 18 months, and forfeit his

licence for 12 months in addition to being liable to an action for damages by the aggrieved party.

Twentieth.—No person is to break open or injure any package of the cargo or lading to ascertain its contents—to remain as it was saved. Cables and anchors not to be removed and nothing of the rigging to be cut or removed until cargo is saved, under penalty of fine not less than £1 nor more than £10, —the person offending to forfeit all claim to salvage, and his licence suspended for a period not more than six months.

Twenty-first.—The master of the wrecked vessel not to bargain to participate in salvage under penalty of £100, and the salvor who may have been a party to any such bargain to forfeit all salvage, and his licence suspended for a period not exceeding two years.

Twenty-second.—Any bargain between the master of a wreck and any licensed wreckers for their services, shall not be binding at any port of the colony where the question of compensation can be fairly adjudicated.

Twenty-third.—The wreck master, in case of salvage being completed, to be allowed an extra reward of from £5 to £20 for services according to circumstances as shall be considered proper by the Salvage Court.

And in case of any person being seriously injured or wounded in such service, in addition to his salvage he shall be awarded a sum not exceeding £20 on that account; and in case of any salvor being killed in that service, his widow shall receive a sum not exceeding £20 in addition to the salvage that may have been due to the deceased person.

(To be concluded in our next.)

CASES OF EMERGENCY AT SEA.—*A Man overboard—Icebergs—Fire.*

I have never seen or heard of a station bill for a merchant ship's crew when meeting either of the following cases of emergency, viz., "a man overboard," "an iceberg close under the bows," or "ship on fire." I have looked in every direction for some advice how to act if either of the above calamities overtake me at sea. The importance of the subject, and probability of its occurring, have forced me to attempt something of the sort myself; but I feel that I have failed in making a station bill, for a crew of thirty-four, and would feel obliged to you or any of your correspondents for some suggestions on the subject. I send you an account of what I have done.

I suppose the ship to have two quarter boats, fitted with Clifford's lowering apparatus. When the sea watches are chosen, or as soon as possible afterwards, pick out two life-boats' crews of six good men each, and appoint a coxswain and bowman to each boat, the bowman to be responsible for the falls and gear being clear, and the coxswain for the boat being kept clear of every thing not belonging to her. The coxswain and two after oarsmen being in one watch, the bowman and the other two in the other, so that a boat's crew would be always on deck, and when the boat is sent away the boat's crew of the watch on deck to go in her. If a second boat be wanted, the boat's crew of the watch below to go.

When an alarm of a "man overboard," is given, the life-boat's crew of the watch is instantly to man the boat, and the officer of the watch can order her to be lowered without confusion. This leaves all the rest of the ship's company to shorten sail, tack, or do anything required.

For several years I have kept a circular life-buoy (stopped with twine to the tiller) lying on the tiller and rudder-head, so that if a man fall overboard the helmsman can throw the life-buoy to him on whichever side he may fall

Two instances have occurred in my experience of people falling overboard, and in one the helmsman threw the buoy over the person's head, in the other so close to him that he caught hold of it as soon as it touched the water.

When the boat is clear of the ship the commander can adopt any course he chooses to pick her up again. If the wind is fresh, and the ship close hauled, perhaps the quickest way would be to stand on for seven or ten minutes, then tack and stand back to the boat.

I have not had much experience among icebergs, and do not know how far they may be seen from the ship during a foggy night. I was once running at the rate of ten knots in the parallel of 50° S., and during a break in the fog saw five icebrgs, one of them right ahead. The fog was coming on again, so I kept the one ahead set as long as I could see it, and steered for it, keeping a good look out. The sun was shining, although the fog was very thick. From the time we again saw it until the ship's bows came abreast of it, was just seven minutes; and from the time it passed me in the quarter boat until I lost sight of it, five minutes.

The next day, going at the same rate, but thick fog and misty rain, the watch all on the topgallant forecastle looking out, and myself and second mate looking out on the poop, we did not see a large lump of ice, about twenty feet high and fifty feet long, until it was abreast of the main chains, when the ship lurching to starboard, I thought the quarter boat would have struck it. I am therefore inclined to think that ice cannot be seen far in thick weather. When running among ice in thick weather, I have made a rule to keep the ship under such sail as would allow her to be thrown all aback; and if ice is reported close ahead, or on the lee bow, to put the helm down; for I consider that a ship would receive less injury if she fell on the broadside of an iceberg, when flat aback, than if she ran stem on it. I am aware that Sir J. C. Ross threw the *Erebus* aback when on the weather side of a berg, and made a stern board clear of it. Could a merchant ship not do the same? I do not think ice could be seen during thick weather in time to wear the ship clear of it. As a general rule would it not be safer to throw all aback? I should like your opinion on this. [Certainly,—preferable to wearing, for probable want of room, and moreover it may be desirable to haul off on the tack that she *might* come round to if desired.—Ed.]

A Passenger Ship on Fire.

The master to *command.*

The first mate and three seamen, assisted by two intelligent passengers, to work the fire annihilators, to discharge them as near the fire as possible; to recharge and work them as long as the spare charges last.

The carpenter and two A.B.s to rig the fire engine, one A.B. being told off to hand down the hose. The engine to be worked by passengers, two A.Bs. with them.

Coxswains of life-boats to see them clear for lowering, and prevent any person from going into them. The bowman of each life-boat to take the boom brace whips for tow ropes for the quarter boats, making one end fast at the gangway and passing the other aft into the boats. When this is done, assist the sailmaker in getting the boats' sails, water-breakers, &c., into them, then assist the coxswain in keeping the boats clear.

Sailmaker to get boats' sails into them, and get two or three bolts of new canvas up.

Third mate, baker, and a boy to get up two or three bags of biscuit.

The steward and cuddy servant to carry the powder, blue lights, &c., into the captain's cabin, ready to throw overboard; then put spare compasses into life-boats, and muster hams, cheese, and tins of salmon and meat ready for the boats if wanted.

A steady man told off for the helm, to keep the ship before the wind, unless ordered by the master not to do so.

The cooks to muster water-breakers or gang casks, and fill them with fresh water.

Second mate, boatswain, and all the crew not told off for other duty, to haul up the courses, clew up top-gallant sails, and take in the fore and aft sails. Then close all ports, ventilators, scuttles, hatches, &c.; stop the scuppers, and flood the decks with water.

All stores to be placed where ordered by the master.

Second Duties.—Carpenter and joiner to put a hammer and some nails into both quarter boats, then muster axes, &c., for any purposes they may be required.

Second mate, boatswain, and four A.Bs. to get up stay and yard tackles ready for boom boats if wanted. When the boats are prepared, every man to work with a will and without noise at the fire engine, or in drawing water, using wet blankets, &c.

The surgeon to attend exclusively to the women, and muster them in any place pointed out by the master, where they will be clear of the fire and handy for the boats. Every woman to bring up her blanket with her. The captains of the messes to bring up the water kegs, and the cooks of the messes to bring up the bread bags.

I consider that telling people off to perform certain duties will prevent confusion, and those persons told off to draw water or work the fire engine would be more likely to do so with a will if they knew that some of the crew were preparing the boats for service if wanted. For although I have stationed men to see them clear, &c., at first, I should not think of abandoning the ship until really forced to do so; nor am I certain that the work of extinguishing the fire on board would not be expedited by putting fifty women and children into the quarter boats and towing them astern.

My object in these remarks is to obtain some information how to act in either of the above positions if it should be my misfortune ever to be placed in one of them. What I have written is a copy of instructions that have been pasted in the ship's forecastle some voyages: I know they are very poor indeed, and should be glad of better.

I remain, &c.,

A MASTER.

NEW CALEDONIA, OR WEST CALEDONIA.

Whoever took upon himself to give the name of New Caledonia to the district of North America to which Sir Alan M'Nab is so judiciously appointed Governor, was following a very old fashion that has proved very inconvenient, evincing at the same time a very small stock of resources for use when *new* names are wanted and not old ones with that ill used monosyllable attached to them. Who for instance thinks of now using the term New South Wales for Australia; and although the New Hebrides might have been new to this country in Cook's time, they are old now, or should be so, and will hereafter undergo some such change as Van Diemans Land has experienced. But Cook gave us a New Caledonia, and surely one is enough, more especially as there are abundance of names to be had for the seeking. Therefore as the new New Caledonia will hereafter become Old Caledonia, and as it is no newer now than it always has been, would it not be better, as at least avoiding confusion

with that of Cook, to lay aside the old fashion of renewing every old name. If it must be Caledonia, (to which certainly objections might be made,) as it is far away in the Western part of the Western world, why not call it West Caledonia at once. This would at all events prevent mistakes with New Caledonia of Cook, and expresses as briefly as can be desired (in any addition to the word Caledonia) the position of the new British colony in the old British possession.

The Royal Navy in Commission.

In some of our late numbers we have preserved a statement of the naval force of different countries, and we now add that of our own according to the number actually in commission at the end of last month. We have separated the sailing ships from those using sail and steam. The latter stand as follows:—

First Rates (110 guns and upwards), two ships, carrying 251 guns, 2,100 men, and 1,200 h.p. steam. *Second Rates* (of 110 to 80 guns), eleven ships, carrying 898 guns, 7,386 men, and 5,750 h.p. *Third Rates* (from 80 to 70 guns), three ships, 153 guns, 1,128 men, and 1,400 h.p. *Fourth Rates* (from 70 to 50 guns), twelve, carrying 693 guns, 4,782 men, and 4,200 h.p. *Fifth Rates* (from 50 to 30 guns), four ships, carrying 141 guns, 1,482 men, and 1,810 h.p. *Sixth Rates* (all other ships bearing a captain), twenty-five ships, carrying 384 guns, 6,351 men, and 9,691 h.p. *Sloops* bearing a commander, fifty ships, carrying 363 guns, 7,016 men, and 13,631 h.p. *Sloops* and other small vessels, &c., commanded by a lieutenant or master, or second-master, fifty-nine vessels, carrying 118 guns, 2,465 men, and 6,679 h.p. The foregoing amount to 3,001 guns, 32,709 men, and 44,361 h.p., in 171 ships.

The sailing ships are—*First Rates*, four, carrying 443 guns and 1,284 men. *Second Rates*, three, with 252 guns and 1,774 men. *Third Rates*, seven, with 520 guns and 3,012 men. *Fifth Rates*, seven, with 298 guns and 2,450 men. *Sixth Rates*, eleven, carrying 209 guns and 1,914 men. *Sloops* bearing commanders, thirteen, with 146 guns and 1,636 men; and *Sloops* commanded by lieutenants, &c., fourteen, carrying 56 guns and 660 men. Amounting to 1,924 guns and 12,730 men.

The whole amount may be thus stated—

	Guns.	*Men.*	*Ships.*
Steam and Sail	3,001	32,709	171
Sail only	1,924	12,730	59
	4,925	45,439	230

Loss of the "Ava."—Result of the inquiry held at Greenwich Police Court into the loss of the Peninsular and Oriental Steam Navigation Company's steamship *Ava*, which was wrecked on the coast of Ceylon, at Trincomalee, on the 16th of February last. The investigation was conducted by Mr. Selfe, the Thames Police Court Magistrate, and Captain W. H. Walker, of the Board of Trade, Nautical Assessor, and occupied two days:—

Captain Kirton, before leaving Calcutta, had been ordered by his Superintendent to land at Trincomalee about £5,000 Government treasure. But for this order and the consequent deviation from the ordinary route, the course of

the *Ava* would not have lain within fifty or sixty miles of Trincomalee, or of the spot where she was subsequently lost.

On Captain Kirton being asked to give his own explanation of the loss of the ship he assigns the following causes:—

1. That the current in a W.N.W. direction towards the shore, the rate of which at five o'clock he had estimated at about two miles an hour, was when the ship struck running at an increased rate of four miles an hour, and had carried the ship out of her course.

2. That the light seen at 7.30 was seen at the time when and in the direction in which Trincomalee light, on Flagstaff Point, should have been seen by him if he had not been carried out of his course by the current; that he, therefore, mistook it for the light on Flagstaff Point, which, he says, it strongly resembled. He further asserts that the light on Flagstaff Point was not properly lighted on that night; that if it had been properly lighted and hoisted at the top of the flagstaff he thinks he must have seen it before the ship struck, and that it would have induced him to alter his course accordingly.

Captain Kirton omitted to take proper precautions; instead of continuing the ship's course at full speed for two hours after dark, he ought to have slackened speed, to have stopped the ship, and hove the lead. Had he adopted these proper and prudent measures the calamity which followed would have been averted.

The Board of Taade in consequence directed that his certificate of competency shall be suspended for six months.

THE ATLANTIC TELEGRAPH.—The *Agamemnon* arrived at Queenstown on July 12th, having left the rendezvous in the middle of the Atlantic on the 6th. On the voyage out with the other vessels of the squadron a succession of tremendous south-westerly gales was encountered, which scattered all the ships for some days. During this time the very heavy and unequal load on board the *Agamemnon* made her condition one of danger. At one time, indeed, the storm was so violent that the chances were strongly in favour of her going to the bottom with all on board. The worst storm was during the 20th and 21st of June, when the *Agamemnon* rolled so heavily and dangerously as, in her then trim, to lead to serious fears that the masts would go overboard, or that she would capsize completely and founder. In these heavy lurches the coals which were stowed in the main and lower decks broke away, and seriously injured several of the crew. The electric instruments were all injured. The main coal in the bottom of the hold shifted. The deck boats got adrift. The iron screw guard was wrenched in two, and the waste steam pipe between the boilers broken,—all by the heavy rolling. Twice, after every effort had been made to ease the ship, which was much hampered by the upper deck coil of 236 tons forward, it was found necessary to run before the wind, so that it was only on the 25th of June that the rendezvous was made, and the other vessels of the squadron sighted.

The first splice was made on the 26th, and was broken an hour afterwards on board the *Niagara*, after three miles had been payed out from each vessel. The second splice was also made on the 26th, and broke at 4h. a.m. of the 27th, parting apparently at the bottom of the sea, after some miles had been made from each ship. The third and last splice parted at 10h. 30m. p.m. on the night of the 29th, about six fathoms below the stern of the *Agamemnon*, after 146 miles had been payed out of that vessel. The cause of the last fracture is not known, as the strain of the wire was only 2,200lbs.

After this, the *Agamemnon* returned to the rendezvous, and cruised for five days, during which she met with sufficient bad weather to prove that the removal of the upper deck coil had almost restored her to her trim, and certainly rendered her buoyant on a sea. Unfortunately, the *Niagara* did not return to the rendezvous, so that the only fine weather which the expedition had was totally lost, and the *Agamemnon* had to proceed to Queenstown. There are still 2,500 miles of wire on board the two ships.

After filling up with coals and fresh provisions the vessels started for a final attempt on Sunday the 18th.

SUBMARINE CONVULSION.—*Callao, May 11th.*—The steamer *Lima* arrived here yesterday from Valparaiso and reports that on the 3rd of May a very severe shock of an earthquake was experienced in Coquimbo, causing some serious damage. The ships *Gladiator* and *Globe* which arrived here a few days since, also experienced the same shock at sea on the same day, being distant from land 160 to 200 miles.

Iquique, May 5th.—The *Janetta and Bertha,* Captain Black, of Hamburg, with about 300 tons of copper ore on board, loaded at Chanaral and Caldera, when off the latter port (twenty or thirty miles to the westward) on the 26th of April, experienced a shock as if passing over a reef, and immediately commenced to make water. The leak gradually increasing, the vessel was abandoned the same day. The master, his wife, two children, and seven of the crew arrived here in the launch on the 1st of May. The second mate and three men, who left in the gig, are missing.

Naval Chronicle.

Orders have been promulgated by the Lords of the Admiralty, on the command of the Queen, for the assembling of a squadron forthwith at Portsmouth to attend her Majesty to Cherbourg on her forthcoming visit to the Emperor and Empress of the French at that great naval rendezvous. This squadron will consist of six sail of the line, six frigates, and a flotilla of the Queen's and the Admiralty steam yachts, comprising the following, the whole under the command of Admiral Lord Lyons, with Rear-Admiral Sir C. H. Fremantle as second in command:—

Royal Albert, 121, Captain the Hon. Francis Egerton, flag of Vice-Admiral of the White the Right Hon. Edmund Lord Lyons, Commander-in-Chief; *Hannibal,* 91, Captain H. Chads, flag of Rear-Admiral of the Red Sir Charles Howe Fremantle; *Brunswick,* 81, Captain Ommanney; *Orion,* 91, Captain D'Eyncourt; *Renown,* 91, Captain Forbes; *Cæsar,* 91, Captain Frederick; *Euryalus,* 51, Captain Tarleton, C.B.; *Arrogant,* 47, Captain Heath, C.B.; *Diadem,* 32, Captain Moorsom, C.B.; *Curaçoa,* 31, Captain T. M. Mason; *Racoon,* 22, Captain Paynter; *Terrible,* 21, Captain Glasse, C.B.; *Valorous,* 16, Captain Aldham; *Victoria and Albert,* Captain the Hon. J. Denman; *Fairy,* Royal tender, Mr. D. N. Welch, Master, R.N.; *Elfin,* Royal tender, Mr. A. Balliston, Master, R.N.; *Osborne,* Admiralty yacht, Mr. G. H. K. Bower, Master, R.N.; *Black Eagle,* Admiralty yacht, Mr. J. E. Petley, Master, R.N.; *Fire Queen,* Admiralty yacht, Mr. W. F.

Paul, Master, R.N.; *Sprightly*, steam tender, Mr. George Allen, Acting Master, R.N.

It is by her Majesty's express wish and command that Admiral Lord Lyons commands in chief this squadron of honour, for which duty the *Royal Albert*, carrying his lordship's flag, has arrived at Spithead.

Sayings and Doings.

It is said that the Queen's intended visit to Cherbourg is fixed for the 4th of August. Her Majesty is to be accompanied by a large muster of her "faithful Commons," also by Lord Malmesbury, Lord Derby, Mr. Disraeli, and the Duke of Malakhoff, and that her Majesty will spend only one day there.

The Minister of Marine has ordered the inscription recording the completion of the works and the inauguration of the inner dock to be changed, in order that the Royal visit may be included in the scroll.

A medal will be struck at the French Mint commemorative of the visit of the Queen of England to Cherbourg.

A model in relief of the works of Cherbourg, in the proportion of a millimetre to a metre, has been ordered to be prepared as a present to the Queen.

The *Accra Herald* says that the Admiralty Court at Monrovia have, in the case of the *Regina Cœli*, awarded 6,500 dollars to the *Ethiope*.

The British brig *Antilla*, for Liverpool, from the Sandwich Islands, brings about 2,000 barrels of whale and cocoanut oil, a large quantity of hides, and about 35,000lbs. Hawaiian wool. This latter article of export is worthy of note, as being but the commencement of a large business in the wool trade of those islands.

The Admiralty have presented the Liverpool Mercantile Marine Association with a frigate, to be used as a training school. The frigate in question is the *Vestal*, of 26 guns, and in splendid condition. She is now stationed at Chatham, and will be sent round to Liverpool when needed.

The electric telegraph is henceforth to be substituted for the ordinary telegraphic signals along the French coast.

The loss of the Atlantic Cable, ascertained by the return of the *Agamemnon* to Queenstown, is said to be 300 miles, which, with that lost by the *Niagara*, makes a total of 600 miles. Notwithstanding, another atttempt to deposit the cable has been resolved on.

The new lighthouse erected on Sydney Heads, near the point where the *Dunbar* was wrecked, is nearly completed, and will be in operation next month.

Another public erection, for astronomical as well as nautical purposes, is on the eve of completion at the signal station near Miller Point—the observatory, under the superintendence of the Rev. Mr. Scott, as astronomer royal.

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

SEPTEMBER, 1858.

Report of the First Voyage of the Missionary Packet "Morning Star"—*to the Caroline, Kings Mills, and Ralick Chain of Islands. By Capt. S. G. Moore.*

Having completed our outfit for a voyage of nine months, I received orders from the Directors of the Hawaiian Missionary Society to take on board as cabin passengers—Rev. P. J. Gulick, Delegate of the H.M.S.; Rev. H. Bingham and wife, missionaries; J. E. Chamberlain, Esq. Steerage passengers—Noa and wife, Hoe and wife, native domestics; Kanakaole, native printer.

My crew are as follows:—Thomas Johnson, first officer; Orramel H. Gulick, second officer; William Roynstun, steward; Martin Switz, cook, James Watson, carpenter; William D. Taber, George Wilson, Edward Jackson, Charles Grinnell, able white seamen; three kanaka seamen, and a kanaka boy to act as steward for the steerage passengers.

My instructions proceed to say:—"On leaving Honolulu you will touch at Koloa for certain supplies to be furnished through the agency of Dr. Smith. Thence you will proceed to Waimea and set on shore Mrs. M. P. Whitney. From Waimea you will proceed to Strong Island, and thence to Ascension."

Receiving on board a pilot, we sailed from Honolulu at five p.m., August 7th, civil time. At 8h. p.m. we shortened sail, and at 9h. a.m., the 8th, we saw the island of *Kauai*. I rounded to in 17 fathoms of water, and let go the anchor, which I should judge, by

the working of the chain, fell on a steep declivity and rolled down. At a depth of 50 fathoms we found the anchor all clear of the bottom, and the vessel drifting off rapidly. Believing it to be useless to pay out more chain, I ordered to stopper, and sounded but could find no bottom, at which we commenced heaving up, the Trades blowing very strong. After heaving up the anchor, we reefed, and commenced beating up for the anchorage against wind and current. But the time of landing was so delayed that I stood off for the night, and the next morning anchored in 10 fathoms, coral bottom.

The anchorage is a mere roadstead, and very unsafe in the winter months. Early next morning we began to receive beef, poultry, pigs, bananas, kalo, together with twelve barrels of fine sweet potatoes. At daylight, the following morning we sailed for *Waimea*, and anchored at 10h. a.m. In the afternoon we spread our canvas for *Strong* Island.

21st.—Up to this date we have had light winds veering from E.S.E. to E.N.E., part of the time cloudy with heavy rain squalls. This day we cross the meridian, and as we have been losing time we drop one whole day. I am now steering for *Uderick* Island, one of the northernmost of the *Radack* chain. I shall pass through both chains on my passage down.

26th.—Last night we shortened sail, expecting to be up within ten miles of land by daylight. At sunrise, this morning, discovered land right ahead. Ran within a mile and a half of the shore. Saw several natives, but no canoes. At 11h. a.m. *Tagai* Island bore West. Saw no natives. Supposed not to be inhabited. These islands are embraced in the great *Radack* chain, which has been but imperfectly explored. In the night we proceeded with great caution, shortening sail, and if not starlight we heave to.

27th.—This morning chronometer gives us ten miles West of the *Legeip* Group, but we can discover no land from mast-head. We are now steering S.S.W. for the *Menzehoff* Group. The winds are very light and it is very warm, thermometer 92°.

28th.—Thick, rainy, and squally all day. Got no observation, dare not run. Shortened sail and hove to.

29th.—At daylight made sail and kept her away West. Soon after, saw land right ahead. Ran along the reef for twenty-five miles and counted seventeen islands. All these islands are covered with verdure, look beautifully green and inviting, and are connected by a reef with large lagoons inside. Doubling around the southernmost island, near in, we saw several inhabitants on the beach, one of whom waved a bunch of dried leaves on a pole. The water looking bold all along shore, I ran within half a mile of the shore, which seemed to afford the natives a vast deal of satisfaction, for they danced and capered around considerably. Soon after a canoe, with a sail made of lau hala matting, was seen to shoot out from behind a farther point, with four natives on board.

In about half an hour they came alongside. They were strong, healthy, fine looking men, a shade darker than the Hawaiian people,

and wore a large grass maro. We gave them some presents, but we could not induce them to come on board. While we were passing down some small presents, they seemed, all at once, to be frightened, and taking their paddles, pulled away lustily for the shore. They had not proceeded far when they were met by a single native in a canoe coming off. Joining each other they seemed to be holding a consultation, after which the single canoe came on towards us. Coming within hail he made a loud vociferation, and ceased paddling. Holding up a file he quickly came alongside. He was a very fine looking young man. Mr. Bingham handed him an old file, which he accidentally let fall overboard; quick as thought he darted after it, but failing to arrest the truant steel, he returned evidently much disappointed. But he soon became pacified with a few fish-hooks.

The natives in the other canoe, seeing how well their friend was doing, returned, and came alongside. We were highly pleased with the appearance of these natives. They seemed like a harmless inoffensive people.

I saw no place to anchor, but there seemed to be a passage for a boat through the reef. The island lies lat. 8° 42′, long. 167° 42′ E.* Their language was perfectly unintelligible to us. At 4h. p.m. we squared away. It soon fell calm. Just before sunset we saw a canoe approaching with a single man in it. We soon recognised the man as being the same who came before. Such was his desire to have intercourse with us, that the poor fellow had paddled five miles. Giving him some more bread and boiled sweet potatoes, he seemed highly delighted, and continued to point to the shore in a supplicating tone of voice, as if trying to persuade our return. He would not leave us till it was quite dark. A breeze springing up, we bid adieu to the island, which for the present I shall call *Dove* Island.

Monday, September 7th.—For the last eight days we have experienced very foul weather, with winds from South and S.S.W. *Strong* Island bears S.W. twenty miles. These head and light winds have caused us to have a very long passage. For the last eight days we have kept right along under the sun, which accounts, in some degree, for this perpetual bad weather. So soon as the sun gets two or three degrees South of us, we shall expect better weather.

8th.—At daylight close in with the land. At 8h. a.m. a pilot came on board, but it fell calm, and perceiving no indication of a breeze, he left for shore. At 10h. a.m. the ship was towed in, and we commenced discharging supplies. The causes which have brought about the unpleasant state of affairs which exist at present in this island, will be explained by Mr. Snow, so there will be no necessity of my repeating them here. Early this morning (Wednesday) a white flag was seen flying at the rendezvous of the foreign party. Mr. Snow and Dr. Pierson immediately took a canoe and went over.

* The chart gives a reef sixty miles in a N.W. and S.E. direction close to this position among the Marshall Islands, calling them Ocean Islands or Quadelon Islands, and that nearest to the position (about ten miles) it calls Paterson Island.—Ed. *N.M.*

Covert, the commander of the foreign party, seemed desirous to negociate for peace, and requested that Captain Laurence and Captain Moore would visit the king, and arrange for a meeting on board the *Morning Star*. Accordingly, Captain Laurence and myself were appointed a committee to effect an interview between the hostile parties.

At 3h. p.m. a boat was manned, and we went over. We found Covert occupying a large house built on a stone foundation, rising some six feet from the ground, and barricaded inside, with a solid wall of coral stone about six feet high, above which was placed a barricade of three inch oak plank, the whole bound together and made very strong by green withes. We expressed to him and his people our desire to do all we could to bring about an amicable arragement of pending difficulties. He said, he wished to have an interview with the king, and, if possible, prevail upon him to cease hostilities, and draw off his men from the forts or breastworks which had been thrown up on the South side of the bay. To allow him and his partner, Johnson, (I was surprised to recognize this man as one who had sailed with me some five years since,) to take care of their property unmolested, &c.

With this view we left to wait upon his Majesty, whom we found seated on a mat, accompanied by his Queen, who is of small stature, and rather pleasing countenance. He received us graciously, and ordered some cocoanut milk to be brought. After we had drunk our milk, and paid him some compliments of a nature calculated to awaken in him a just appreciation of the dignity of his position, he introduced our negociation by asking in English, "Well, what Covert speak?" Making known to him Covert's desire for peace, he broke forth into a fit of immoderate laughter, exclaiming, "Ah, very good. Covert good man, fight plenty, me laugh too much—he kill king—ha, ha, ha?—he kill all kanakas, ha, ha,—he like be king very much, but he no like kanaka's musket, ha, ha, ha!" "Well, what you do, king? you come on board *Morning Star* to-morrow at nine o'clock, and I will bring Covert on board, and we will have talk?" "Very good, me come, me bring my chiefs, we talk."

At 9h. a.m. the missionaries assembled, and we soon saw approaching, in his whaleboat, the king and chiefs. Manning our boats, and hoisting a white flag, we started for the rendezvous of the foreign party. Covert seeing our approach, and anticipating the nature of our errand, was all ready for embarking, and jumping on board, we were soon alongside the peaceful *Morning Star*, with her emblems gracefully lifting in the breeze. The scene was at this time worthy of a painter's skill. The decks were crowded with natives, while all around the vessel were canoe loads of anxious spectators, with upturned eyes, eager to catch every word that fell from the interpreter's lips. The king and Covert sat opposite to each other, while the chiefs were arranged in the rear. The meeting was opened by Mr. Gulick offering prayer. Capt. Laurence was chosen to conduct the negociations, Mr. Snow, interpreter.

Capt. Laurence.—"Mr. Covert, it seems that you have received foreigners into your house, and taken up arms against the king. What have you to say on the subject?"

Covert.—"Two or three Rotumah men were in my employ as labourers. The others were working for themselves, were peaceable, inoffensive men. Without giving any offence to the king, or his chiefs, they were attacked, and five of their number killed. The others ran to my house for protection; I felt bound to protect them, and we fought. I have no desire to keep the Rotumah men in my house, provided the king will allow them to get food for themselves till such time as they can get away in some vessel. I and my partner wish to live here peaceably,—we have property, wives, and children. Will not join any foreign party against the king."

Mr. Snow here, partly in English and part in native tongue, explained to the king Covert's request.

He answered in broken English,—"Me like Covert, Johnson, and Rotumah men go to away. Spose ship come, Covert speak sailors, you go and kill king, we give you plenty land. Me no like Covert stop here, better go; spose stop here, fight too much."

After considerable debate, it was decided that Covert and Johnson be allowed to leave their house to procure food without being fired upon; but that the Rotumah men should not be allowed to go outside the walls. Here ended the conference for the present. In the afternoon a meeting was held in Mr. Snow's house, and I gave permission for all hands to attend.

The morning of the 15th proved fine, and at daylight the anchor was away, and with four boats ahead we quickly towed out. After getting a sufficient offing, the boats were called home, and Captain Laurence and the king bidding us farewell in the native tongue, we hauled close on the wind N.N.E., but it soon fell calm, and to account for our long passage to *Ascension*, [about 300 miles W.N.W. of *Strong* Island,] I will give a skeleton abstract of my journal.

15th.—At noon *Strong* Island bears West fifteen miles.

16th.—Calms and light airs from S.W., one knot N.E. current. Noon, *Strong* Island bears S.W.b.W. twenty miles.

17th.—Calm and rain. Island bears S.W. thirty miles.

18th.—Light airs from S.W.; lat. 6° 37′, long. 162° 41′.

19th.—Light and squally; lat. 7° 24′, long. 161° 35′.

20th.—Calms and heavy rain, no observation.

21st.—Light breeze from W.S.W.; lat. 6° 53′, long. 160° 4′.

22nd.—Light airs from West. Supposed ourselves to be near *Duperey* Island. Tacked to the N.W. and again South. At daylight saw the land right ahead, about four miles off. About sunrise saw a boat moving in the lagoon. Soon after saw them launch it over the reef. Stood near in and the boat came alongside. It was a whaleboat paddled by natives, and commanded by a white man, who represented himself to be a native of Massachusetts. He said his name was Higgins; that he had resided on the island three years; that the

natives were perfectly friendly, and that he would be glad to have the missionaries go on shore. The wind at this time canted N.N.W., fair for *Ascension* and I was anxious to proceed; but the missionaries wished to see how affairs were on shore. Consequently, we manned a boat, and Mr. Snow and Dr. Pierson went on shore.

Having bargained for 500 lbs. of turtle, both boats left the ship together, and after an absence of two hours returned, Higgins bringing 500 lbs. turtle as a present for the mission at *Ascension*, 100 cocoanuts for the vessel, and 500 lbs. of turtle I bargained for. These natives were fully as much civilized as those at *Strong* Island, and all those who came off had on pantaloons.

Duperey or Wellington Group lies in lat. 6° 40′ N., long. 159° 50′ E. [corresponds with chart.] Like all coral islands they are low, and surrounded by a reef from an eighth to a quarter of a mile in extent. The circumference of the group I should judge to be about fifteen miles, embracing a lagoon; but there is no ship passage through the reef. Cocoanut oil is manufactured here to some extent. Mr. Snow was highly pleased with his visit on shore. He represented the natives as being a fine healthy looking people, their houses well built, clean, and comfortable. They numbered about one hundred souls. There are two natives here belonging to the King's Mill Group. They were very anxious to be taken on board and be carried home. Perhaps we may stop and take them on our passage back, for they may be of use to us in our communications with the natives at those islands. Higgins says the natives would be glad to have a missionary come and live with them. There is a great need of native missionaries to come to these small islands. They would be well received, and I hope to land one here on my next voyage. The latter part of the day and night the wind was West, with heavy rain. At daylight it hauled N.E.

At 7h. a.m. we saw *Ascension*, and at 1h. p.m. took a pilot and came to anchor in *Metalanim* Harbour. This island has been so well described by Dr. Gulick that it is unnecessary for me to say more. The pilots here are exorbitant in their charges, asking ten dollars each way. I paid him, and at the same time informed him that I would take the vessel out myself. At the expiration of a week I received orders to sail for Jokoits Harbour, Mr. Doane's station, on the North-West side of the island, for the purpose of taking in his effects.

30th.—Proved foul weather, and we could do nothing. At midnight it cleared, and being calm and the tide favouring, I gave orders for getting under way. We wayed anchor and sent a boat ahead to tow. Taking the lead, I commenced sounding my way along. Ten fathoms—ten fathoms, every heave. In a little while I perceived she had no headway. Supposing the tide had turned, I called out, "Pull ahead, boys; give way strong, or we shall be obliged to let go again." The mate, looking over the side, thought he saw bottom. Taking the lead over the other side, instead of ten fathoms, we found

five feet, the reef being perpendicular and the vessel lying as if alongside a wharf. Taking out a kedge we hauled her away, and she drifted along out. By daylight we had arrived in the outer harbour, and a breeze springing up we shot through the passage, and at 3h. p.m. were off Jokoits; but the wind being ahead we hove to for the night. The next day was squally and heavy rain. Judging by what I could see from the ship's deck, I formed an opinion that it was unsafe to attempt the Jokoits Passage, and I was confirmed in this opinion by lowering away and going in with the boat. A heavy swell set into the passage, and I could not head off on either tack.

It was calm during the night, but with daylight a light breeze sprang up from W.N.W., and at noon we were off *Roan Kiddi*. The pilot came on board and recommended anchoring in the outer harbour, as we could not work through the narrow channel connecting the outer and inner harbours, it being only 200 feet wide. The next morning the wind was fair, and we ran in without difficulty, and came to in five fathoms water, about half a mile from Mr. Sturges's house.

The shore all around this island is lined with an almost impenetrable jungle of mangrove. This makes the landing in some places disagreeable, and destroys in a great degree the beauty of the line of shore, which in some places rises abruptly and in others stretches away inland, burthened with a heavy growth of timber and intersected by rapid streams, affording an immense water power, where mills might be erected, and of which we opine it could never be affirmed that they were driven by the force of circumstances.

After remaining here a week I received orders to go round to *Metalanim* Harbour, and then to proceed to *Strong* Island, touching at *Duperey* and *McAskill* Islands, if circumstances would permit. We number now forty-two souls on board, all told.

October 20th.—Yesterday we hove in sight of *Duperey* Island. The wind being light we were till 3h. p.m. getting up with it.

I should have noticed previous to this a circumstance that happened in coming out of *Metalanim* Harbour. The more experience I have in navigating these seas the more I become convinced of the necessity of extreme caution on the part of those who have the management of vessels here. During my absence at *Roan Kiddi*, Dr. Gulick had surveyed the reefs in the outer harbour, and planted limbs of trees on the extreme points. After we had wayed anchor I sent a boat ahead to tow, it being calm, and at the same time we manned our sweeps, and, with the tide in our favour, we swept along at about two knots. Going aloft to look out for the land-marks, I saw we were going all clear of them on our starboard bow, but the sun being directly ahead, I could not see the reef till Mr. Gulick made me aware of it from the boat. I immediately gave him orders to pull around to port. The vessel swinging around with the tide, struck on the reef, and had she struck a rock it might have damaged her seriously, but an ever watchful Providence ordered it otherwise, and we

went clear. This reef had escaped Dr. Gulick's notice, and not only he, but an old native who was on board did not seem to be aware of it. There is nothing but extreme caution that will ensure our safety. These reefs spring up suddenly from unfathomable depths, and there is no such thing as safety night or day. On coming around from *Kittie* Harbour, where, according to all I had heard or read, no dangers existed, I looked over the side and saw the bottom just in time to haul off. The reefs are sometimes perpendicular, and then, again, when you would suppose them to be barrier reefs, they take the form of fringe reefs, and shoal water extends a great way out. The discoloration of the water is no criterion either, for sometimes the clouds will cause one to be deceived in the appearance of the water. As yet, I have found no object in nature, that will indicate the presence of a sunken reef.

20th.—At 1h. p.m. the look-out at mast-head announced land in sight. This was *McAskill* Island. It bore E. 20° S. The wind being light, we did not get near the land till next morning. At an early hour a canoe came off loaded with bananas and cocoanuts and containing seven men, who seemed very friendly. Their heads were bound around with wreaths of red and white flowers, and around their arms were wreaths likewise, which latter were a token of friendship. Their only covering was a belt of grass, about three inches wide, worn around the hips, which answered as a maro. After they had passed up their trade we invited them on board, and they readily complied. After looking round, they formed themselves into a circle and set up a wild cry or chant, at the same time striking their breasts and pointing upward and downward, and throwing their arms around vehemently. This seemed to be an introductory ceremony, for they now seemed very familiar and fond of us, throwing their arms around us and rubbing our noses with theirs. The weather was very unpropitious. Heavy squalls of wind and rain followed each other in quick succession, which precluded the possibility of lowering our boats.

At about 10h. a.m. it cleared up in some degree, and Messrs. Snow and Doane, with Dr. Pierson, went on shore, while I sounded off the village, close in, with no bottom at 100 fathoms, and sought for the ship passage through the reef which is described by Finley and others;—but there is no ship passage, and here is another proof of how little reliance can be placed upon the statements of navigators in these seas. The king received them with great demonstrations of joy; after which he hastened off to the ship, attended by his chiefs. He was about sixty years old, well built, and exceedingly voluble,—begging, singing, and dancing almost at a breath. Here is a specimen of his acquirements in the English language,—"Capin, go shore, me give cocoanut, bananas, taro, all plenty chicken, pig, me like hatchet, tobacco, one file." The language of these natives resembles the Bonabe language much. Mr. Doane could make himself understood. The king said he wanted a missionary to come and live on his island. He would give him land to live on, &c., &c.

I should say more about this island and its inhabitants were it not that I understand the missionaries intend to give Dr. Anderson a full description of their visit. The boat returned at 4h. p.m., and I hauled on the wind, which was now E.N.E., blowing fresh and heavy clouds rising fast. At the turning of the monsoons it sometimes happens that heavy gales will be experienced in these latitudes. The clouds assuming a more threatening aspect as night drew on, I ordered the canvas nearly all in, and battened down the hatches fore and aft. At ten o'clock it blew heavy, accompanied with sharp lightning, and very soon began to rain hard, when the wind ceased, leaving a very bad swell, causing the vessel to pitch and roll badly, doing no more damage, however, than to rile up some stomachs rather unceremoniously. At daylight a light breeze from S.W. sprang up, and we lay our course for *Strong* Island.

26th.—Found us close in with the land, but it being calm, Mr. Snow and family were set on shore. Heavy rain fell during the night, and daylight disclosed to us the disagreeable fact that we had drifted nearly forty miles to the eastward. All that day was spent in getting back, and hovering under the land till daylight, when we were towed in by boats from two vessels lying in the harbour. All hands were now employed in getting on board the three families that we were to take from this island, and their effects. The best possible arrangement of stowage was needful to do this, the vessel being found rather small for so many persons. We have forty-five, all told, on board, and there are only twenty-three berths. The larboard side of the quarter-deck is taken up with lumber, while on the starboard side are lashed a tier of water casks fore and aft. The main-deck is all taken up with timber, while on the forward house, besides our long-boat, are four canoes. The *Morning Star* is much more deeply laden than she was on the passage out. Her hull and upper works, and masts and rigging are all perfect, and she is the most perfect sea boat there is afloat.

November 3rd.—At daylight got under way, and was towed out of the harbour. After getting a sufficient berth, religious exercises were observed; and we then bade adieu to our friend Mr. Snow and his family—saw them safely in their boat and on their way back, when we squared away for *Covel* Group. There is a disagreement on the charts of forty-five miles in the longitude of this group.

5th.—Last night we passed over the position of an island marked on Norie's chart as "Hope Island." It does not exist. It is calm and we are carried along by the current only. [No such island appears on the chart.—Ed.]

(To be concluded in our next.)

The Effect of Different Winds on the Tides—*of the Strait of Dover and its Vicinity. By A. B. Martin, F.R.A.S.*

(Concluded from page 400).

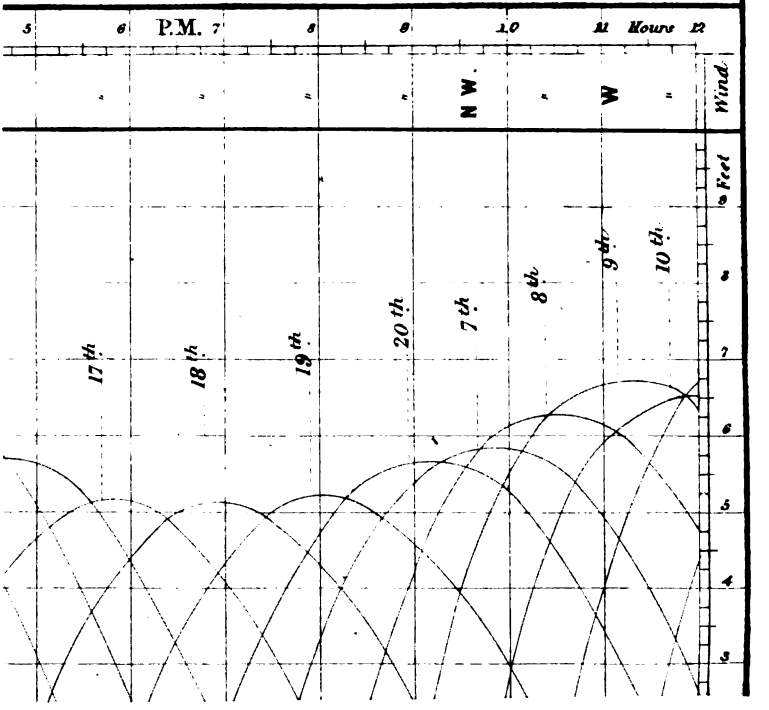
And now to consider the annexed interesting diagram (No. 2), which shows the tides to have been absolutely gambolling like a shoal of playful porpoises,—would they were as harmless! The first tide, that marked "On," is that of the 22nd September, and should have been higher than the 23rd, because the neaps are coming on (and the tides always, naturally decrease from springs to neaps in vertical rise and fall); but the 23rd has a N.W. while the 22nd has a S.W. wind, the result is the N.W. produces a greater rise. The following tides decrease on the 24th and 25th, being influenced by the S.W. wind. The 26th is indeed a remarkable tide. It should have been one of the lowest; but mark the cause and effect. The S.W. wind has veered suddenly, as it usually does, into a terrific N.W., and up goes the stream of flood, the "pendulum" having been struck a fearful blow by the storm in the North Sea; and, notice, the stream of ebb hardly makes at all—the low water of that tide being actually 2ft. 6in. above the mean level, and only 1ft. below the high-water mark of the preceding day.

The following high tide runs higher than the last, and the succeeding ebb is only 8in. below the mean level; then, as the storm dies away, we see the tides gradually regaining their regular course and momentum (the pendulum recovering its regular swing), and on the 28th and three following days rising as they ought in increasing ratio from neaps to springs again, but still acted upon by the shifting gales.

Now I think any man of common powers of observation who has followed me closely through the foregoing explanation, following the lines with his finger as they are traced on the diagram, cannot fail to understand, and will at once perceive, the beautiful registry of the immediate cause and its effect upon the tidal pendulum. I find in the remarks appended to this diagram (which, it will be seen, was taken during the equinoctial gales of 1853) by the Harbour Master at Ramsgate, "that the Gull light-vessel did not swing to the western tide for the space of forty-eight hours. During the whole of this time the water was lifting upon the Holland coast, and Rotterdam was inundated."

This is a most extraordinary case. Here the "tide and half tide" was completely swept away, and yet from the very same cause which I believe produces it in the first instance, viz., the well known law pertaining to all fluids, that of "never attaining a state of rest till all parts of their surface are equally distant from their centre of gravity," in other words, till they have "found their level." In the common course of the tides, the "half tide" would have run three hours and some few minutes to the eastward after high water, and

7th and June 21st 1846.



then the water in the narrow channel having become lower than the level of the North Sea waters, they return upon the half tide, and it runs to the westward for the usual period, maintaining its westerly course while its waters are above the level of the Channel rising waters, but turning to the eastward as they attain the higher level, and again repeating the same action as before upon the North Sea waters after high water by the shore. Whence it would seem that from the retardation of the ebbing water in the North Sea by the action of the gale in sustaining it, the level of the narrow stream was above it during the whole time of low water; consequently, the half tide would continue running to the eastward, from its original momentum, all that time, and the succeeding flood would of course "pile its waters," so to speak, to a much higher level still, when the same effect would be produced again and again, if the gale had lasted so long.

Instances might be multiplied, diagram after diagram might be brought forward, but they all tend to prove the one simple deduction, viz., that northerly gales increase the stream of flood and retard or hold up the falling water, more particularly N.W. gales, for they act upon the whole body of tide which sweeps round the North of England, and of course send it on with an enormously increased velocity; while southerly gales have a contrary effect.

As a general rule, the diagrams would seem to prove that gales from N.E. to East retard the time of high water in the Downs; from East to South they check the flowing water to a very great extent; from S.S.E. to S.S.W. they will almost annihilate the flood and make a difference of six to eight feet, at times, in the vertical rise, producing at the same time corresponding low ebbs; from S.W. to N.W., the flow and time of high water will be accelerated; and from N.W. to North and N.N.E., the flowing water will rush into our estuaries and harbours with the force of a sluice almost, producing an increase of vertical rise nearly as much as nine feet at times, while the ebbs are checked in a corresponding manner to such an extent that the tide signals for allowing vessels to enter Ramsgate will remain up during the whole time of what should have been low water.

These few simple results of observation will appear very clear to any one acquainted with the "Cotidal Maps," on which the flow of Channel and North Sea tides with the times of high water are so beautifully and clearly laid down. In the Rev. Samuel Haughton's pamphlet on the tides will be found a very clear exposition of their leading features; and also a simple method of finding the depth of water, or the rate of the tidal stream, at any time of tide. But this, like Admiral Beechey's, is a fair weather theory and practice, which will be useless under such circumstances as those I have endeavoured to render clear and intelligible to practical men.

In the neighbourhood of the Downs then great care should be taken in sounding and observing the rise, the set, and the drift of the tide. Of course in a case similar to any of those very peculiar effects I have

shown in the last diagram, the soundings would be entirely different from what they should be; but to the observant master this would only be matter for reflection as to "what is the cause of the excess or deficiency of water, and what will be the effect upon the set and drift of the tide." This would soon lead him to fully understand all the peculiarities of that pilotage, and little fear would be apprehended for the safety of the good ship under his command.

No implicit reliance should be placed on any theory, however simple and beautiful it may appear. It is clear that Admiral Beechey's diagram, excellent, simple, and practical too as it is, in fine weather breezes and regular tides, becomes a dead letter in shifting gales, except in the simple use of it (which I have pointed out in the commencement of this paper) for judging whether the flow be in excess or retarded. Practical knowledge of dangerous localities alone can give a man that true sense of safety which is always best found in self dependence. And I would urge upon all the imperative necessity of careful and constant use of the "lead," that much neglected but all-important safeguard, which, with "look out," ranked so high in the estimation of our forefathers,—and still does in that of every man of sense and judgment. This is what we require now-a-days. We want men to possess that intimate knowledge of the soundings and nature of the bottom in these narrow channels that should enable them to say,—"Ah! now I'm in the fairway," when no lights or buoys are visible.

How did our forefathers manage without all these lights with which the face of the waters is now so thickly studded that the danger is not so much of missing them, as of mistaking and becoming confused among them. Men, now-a-days will not condescend to stop and take a cast of the deep sea lead. Competition is strong,—the ship must arrive by a certain time,—or the character of all concerned is lost. "Go ahead!" therefore is now the word, while the all-important one, "all right!" is overlooked. Steam-whistles and gongs, blue lights, guns, and rockets, all kinds of appliances for warning ships off, or for sending up a signal of distress, are provided; but the most important thing of all, "care of the good ship herself," seems to be very much out of fashion. "Go ahead" through fogs and snow storms! keep the whistles going and the gongs beating. "Go ahead," no matter how the wind blows or the tide runs, the course is "so and so;" and ashore she goes upon the safest possible theoretical course, but a fatal one in practice.

Why need this be? There was a time, at no very remote period either, when the British mariner was considered the calmest, coolest, safest man to trust under any and all circumstances, and so I believe him still to be, if he only have a fair chance of showing that he is so. But masters have no chance now, they have now little time and less inclination, generally, to work their youngsters up in scientific acquirements; and mates are worse off still. Middies, to whom we look for our rising officers, are left to smoke, and drink, and run to ruin, if they please; and so the circle works round and round again.

It is not thus in the services of the higher class of our noble ship-owners. Among the large companies, particularly, are to be found men who will have their officers scientific and practical seamen, and it has been my privilege, I am proud to say, for the honour of our beloved country, to fall in with some of the best navigators the world can produce,—would there were more of them. The present system of examination does not seem by its effects to promise much; but we will hope the time will come again when English ships may be entirely thus officered and manned.

It is my earnest prayer, my cherished hope, that men may be aroused to the full sense of the necessity for practical as well as scientific knowledge; that the rising generation of officers may combine the skilful navigator, the expert seaman, and the experienced pilot; and that owners will generally, as some have already nobly set the example, establish schools for them, where they may be, if they will, instructed in all that can be learnt theoretically, and be encouraged by every means in their power, while at sea, to learn what can only be learnt by actual observation and practice,—but which must be so learnt if they wish to preserve the high character of their forefathers, and continue to ornament their noble profession.

A. B. MARTIN, F.R.A.S.

ON MANNING THE NAVY.—*By Captain W. L. Sheringham, R.N.*

(Continued from page 373.)

SIR,—The paper in your July number was limited to a few suggestions for the improvement of the condition of our seamen, in order, if possible, to render the Royal Naval Service more popular* than it is.

My present object is to direct the attention of your readers to a subject perhaps no less important;—that is,—the readiest and most economical means of organizing a standing navy, so expansible that it would be an easy task, if necessary, at the shortest notice even to double the number of our line-of-battle ships.

To effect this, it is manifest we must have a considerable number of trained men on permanent pay under the crown, at least two thirds of whom would be afloat, and the remainder so employed on home

* What a startling announcement is the following from the *Times* of the 26th of July, 1858:—

VOLUNTEERS FOR THE NAVY.—From the 1st of October, 1853, to the 31st of December, 1855, 258 men volunteered into the Royal Navy direct from merchant vessels, and 13,716 from the shore, making a total of 13,974. The able seamen from the merchant shipping numbered 198 men, and the able seamen from the shore 3,694 men; 4,189 from the shore were only "ordinary," or inferior seamen, and 5,833 were second-class ordinary seamen. Of all these volunteers 1,170 had previously served in the Royal Navy.

service as to be readily available on a sudden demand for the rapid equipment of a fleet.

This latter portion it is universally agreed should be considered as a Naval Reserve.

The more the subject is considered the more apparent it will become that it would be highly dangerous to trust to any burst of patriotism on the breaking out of a war for manning a large fleet. It may be very remarkable, but it is nevertheless true, that notwithstanding the feeling of nationality, the indomitable courage, and the love of country which is inherent in every Englishman's breast,—the evidence of times past must convince us that we cannot reckon upon voluntary enlistment for manning our ships at a short notice.

It is undoubtedly true, that when once engaged in a war the love of glory from excitement increases. But this feeling is of slow growth, and therefore it would be most hazardous to trust to it for a sudden armament, when the delay of a month might produce the most serious consequences.

It is matter of history, that ever since England has become a maritime nation, she has always been obliged to resort to coercion of some sort or other to man her fleets. Before she possessed a Royal Marine, the principal seaports were constrained to furnish and man ships for the service of the State; and great inducements were held out to merchants,—charters granted to corporations,—letters of marque sold or bestowed,—and every encouragement given to fit out privateers to scour the seas and harass the enemy. Since a Royal Navy has been organized and become a standing force for national and colonial defence, we have never been able to man it on the breaking out of a war without adopting compulsory measures, too often accompanied by the infliction of grievous hardships, such as a protracted and unlimited servitude. And although we may all rejoice that such things would not be endured now-a-days, I would still submit that successive governments and recent legislators have, with very doubtful prudence, been far too ready to lend the weight of their authority to the delusion that all compulsory service is at an end before they found themselves in a condition to assure the country that they could safely dispense with it.

Few of us would desire a repetition of the horrors of impressment with all its cruelties and injustice; but surely there are many ways of calling out the masses without the infliction of this evil; and I cannot believe that compulsory enlistment, if necessary, would be so unpopular in the country as some people think, if it were wisely and fairly imposed.

In the course of my duties when raising coast volunteers, I gained some experience that will serve to illustrate this part of my subject. When canvassing the fishing ports, I pointed out to the men that although it was no desire of mine to alarm them or their families, still it was my bounden duty to inform them that the nation was engaged in a serious war of doubtful extent,—that the seamen of our navy were nearly all employed in our fleets abroad,—that our own shores were in

a defenceless condition,—and that therefore, as a matter of course, unless they came forward as volunteers to protect them, the time might shortly arrive when they would be compelled to do so under less advantageous terms than those I now offered;—then why not save themselves from the ballot or some other compulsory measure? To my mind their answer was not unreasonable:—"Let the ballot come, they said; it is then fair for all hands. Why should we unman our boats and run a greater risk than our neighbours of being called out by volunteering, and thereby starve our families;—there are many here who would not enrol, but would stick to their work, and get double price for their fish." When I first visited Brixham, sixty men gave in their names for enrolment, and an influential man amongst them told me,—had you enrolled them at once, you would have got 300 men out of this port;—under the belief that they might be forced to serve in our fleets abroad: but how did matters stand in one short month afterwards, on my return to attest them,—every man had withdrawn his name, all fear of anything like compulsion having passed away.

A similar apprehension of some stringent enactment being put in force, worked with parties in a far higher position than these poor simple-minded fishermen; for on my first visit to Portland I was promised the support of the authorities of the Breakwater, to the extent that they would use their influence with their men to induce them to enrol, in order to save them from the effects of any subsequent pressure. A month afterwards I was told by the same parties,—Oh, we have seen a letter stating that no compulsory measures for raising men were contemplated, and therefore we cannot have our men disturbed, and shall not now advise them to enrol. Not a man joined the force. The great fishing companies would afford me no assistance whatever:—"there is no fear of impressment or 'ballot' now, (they said,) and therefore we cannot allow our pilchard and herring men to enrol, as it might seriously interfere with our fishing." It may be fairly concluded therefore from this, that individual interests will not willingly give way to the exigencies of the state,—no, not although the safety of the country might have been positively endangered by the acts of these influential bodies. True it is, that the Board of Admiralty, by a subsequent circular, attempted to mitigate the evil; but it was too late, the mischief had been done, and the men laughed at the letter when I read it to them.

I would ask, what does all this go to prove, if not that it is a most dangerous doctrine to inculcate that coercive measures cannot, and will not, and ought not to be resorted to under any circumstances? Rather, I say, let the country know and feel that when danger is really at hand they must, and will, and ought to be resorted to if on such positive emergency doubts and difficulties arise on the part of the Government of being able to provide men to man our fleets and protect our shores.

In former wars we knew what we had to trust to, viz., the strong arm of impressment, which in a week would fill our ships with men, a large portion of whom were thoroughbred seamen. There was no

thought of training them, for the reason that we had not trained seamen to contend with. Expert sailors—fellows with their sea-legs—and full of bulldog courage—the natural idiosyncracies of the British seaman, at once gave us immeasurable odds over every other maritime nation. But those days are gone. Steam—the improvement in gunnery—the attention bestowed on maritime power and the increase of naval strength, have brought other nations nearer to our own level on the seas. It behoves us, therefore, to look about us, if we still hope to maintain our supremacy.

It is manifest that to insure this we must always have at hand and ready for service, a considerable number of trained seamen over and above the number required for a peace establishment, and it is equally evident that to maintain so large a force by whatever means it may be devised it can only be accomplished at a considerable cost to the State.

It is difficult to understand why it is, in a country like England, the richest in the world,—where millions are spent on decorative improvements, sanitary measures, luxurious establishments, scientific and philanthropic explorations, and charitable institutions, that the face of the legislature should alone be turned from an adequate outlay to insure the safety of her shores from sudden invasion. The time, however, is fast approaching when the subject will be pressed upon us with irresistible force;—let us devoutly hope not when it is too late.

I firmly believe it will be found in the end to be the cheapest plan to submit at once to a certain expenditure, large though it may appear, in order to be prepared for the worst, than to run the risk of incurring serious calamities by remaining unprepared; or to spend enormous sums, as was the case at the commencement of the last war, for the purpose of overcoming and providing against military and naval deficiencies which undoubtedly ought not to have existed.

It is with such considerations as the foregoing that I would introduce the following remarks on the establishment of a Naval Reserve.

In a small pamphlet* drawn up by me a few months ago on the subject of the Royal Naval Coast Volunteers considered as a Naval Militia, I ventured to state that it would be a fatal mistake to consider and reckon upon that force as forming a part of a Naval Reserve. Strictly speaking, they can no more be confounded with each other than the second battalions of the Queen's regiments with the militia. The Coast Volunteers are indisputably a naval militia for home defence, to be called out and embodied for active service by proclamation only on emergent occasions or a threatened invasion, &c.—at least so the Act of Parliament states. They cannot be sent beyond certain limits, viz., 100 leagues from our own coasts, nor can they be compelled to serve longer than one year—except under peculiar circumstances—and under none for more than two years. Surely a reserve of seamen should be understood to mean a body of men kept in reserve for the general service of the fleet, subject to be sent far or near where their services may be required,—and those services retained as long as a

* Which will finish in our next this series of Capt. Sheringham's papers on the subject of Manning the Navy.—Ed.

war establishment is required. Should hostilities break out, I believe great confusion might arise if we were to man our seagoing ships with any considerable number of Coast Volunteers. For instance, if the crews of a channel fleet were half reserved seamen and half coast volunteers, it is quite clear that the latter must be disembarked if it was found necessary to send the fleet or any portion of it abroad;—to do which, on the spur of the moment, would greatly disorganize the ships —be most unfair to their commanders, and imperil the efficiency of the ships to an alarming degree. The parallel case in the army would be to draft so many companies from a militia regiment to fill up a skeleton regiment in the Queen's service.

In the event of a war, there would be plenty of work cut out for a naval militia, the duties of which should be confined to our sea-board forts—manning our block ships, floating batteries, and gunboats, which description of vessels should be at once distributed along our coasts, as pointed out by Captain Gardner in his recent pamphlet, and their officers and crews told off to them from the royal naval militia. Let the "Reserve," as a general rule, alone be embarked in our sea-going ships, whether employed as a channel fleet or on foreign service; for it might be necessary to have a squadron off Ushant one week and in the Mediterranean the next.

Be all this, however, as it may it cannot be denied that some good and well understood system should be organized, which certainly is not the case at present. Let us assume the number of men and boys, Royal Naval Coast Volunteers included, required (but independent of Marines) to be 65,000,—40,000 for active service afloat, and 10,000 as a war contingent in reserve: thus we should have

For service afloat (peace establishment)	. .	40,000
,, ,, on shore, in reserve	. . .	10,000
,, ,, home defence, R. N. C. V.	. .	15,000

This it may be presumed would be a sufficient force to meet a sudden emergency. Should, however, an additional number of men be required as the war proceeds it is evident that if voluntary enlistment should fail recourse *must* be had to compulsory measures.

It is now pretty well agreed upon that the Reserve can be both economically and efficiently employed in situations under the Crown.

As far back as the year 1847 I ventured to submit such a plan by stating that I had long been impressed with the opinion that it would be attended with great benefit to the service if a large body of naval officers, with a considerable number of men, were constantly attached to our *reserved ships* as the inceptive organization of a considerable fleet;—in fact that we should have not only *reserved ships*, but *reserved officers* and *reserved men*. In addition to the service of the ordinary, which might with advantage be performed by the reserved force (distributed in it to an unlimited extent), I proposed that all *dockyard duty*, whether as *riggers* or *such other labour as could with propriety be imposed upon our sailors, should devolve upon them.*

Again, in the May number of the *Nautical Magazine* for 1852,

when entering more fully into the subject, I repeated my conviction "that the Naval Reserve should constitute a part of the fleet, and that when in reserve the men should be kept as much as possible in contact with their own officers. To effect which I suggested that the "Reserve" should be employed under the crown as seamen riggers in the naval yards, in the reserved ships, in the Admiralty home surveys, in the coast guard, in naval transports, and in the marine department of the Customs. Such were my own views; and I will now adduce the opinions of others on this very important subject, for they *entirely* confirm them.

In the month of August of the same year (1852) a Committee of five experienced officers was appointed to investigate the question of the system of manning the navy. The Committee made their report in February, 1853, having examined 6 Admirals, 14 Captains, 9 Commanders, 6 Lieutenants, 10 civilians, and 28 warrant officers, petty officers and seamen. In p. 21, cap. 70, of their Report, they say,—"As an encouragement to seamen to enter the Royal Navy, and to good conduct therein, we think it desirable that deserving men, who have served not less than ten years, should, in addition to the coast guard and as seamen riggers in the dockyards, be appointed to the following situations, and to all others under Government for which their previous maritime occupation may qualify them:—Revenue vessels; Custom's boatmen; tide waiters; victualling hoys; dockyard transports and other craft; boatmen in dockyards; victualling office; and hospitals. And that all such men be held liable to embark in the event of an emergency under the same conditions as coast guard men."

Again, at p. 26, cap. 104.—"It likewise appears in evidence that a large number of men, amounting to nearly 2,000, are employed in boats and other maritime duties at the Custom's ports. We submit whether a portion of these men may not hereafter be advantageously appointed from the Royal Navy in the same manner and under similar agreement as seamen now entering the coast guard. By this arrangement the duties afloat under the Custom's department would be at least equally well performed, and a large number of men would be available as a Naval Reserve."

Again, at p. 33, cap. 159, 160,—"We therefore venture to submit the expediency of maintaining H. M. Navy at such a numerical force in commission as, independently of the Channel squadron, will admit of 10,000 seamen and boys, exclusive of officers, being retained in England for the protection of the ports and coasts of the United Kingdom, &c., &c.

"The above force might, in the opinion of the Committee, be advantageously distributed as follows:—port flag-ships, guard-ships of the ordinary, steam guard-ships, advanced ships, *Excellent* and her tenders, surveying vessels and vessels employed in protecting the fisheries, seamen riggers in dockyards."

Captain Sulivan, in his pamphlet, published in April, 1858, *Remarks on a Merchant Seaman's Fund, &c.*, says at p. 6,—"In addition to the Coast-guard there are from 2,000 to 3,000 situations under

the Crown which might be filled by our picked seamen who have served six years in the navy, and so add the crews of all lighters and hoys in dock and steam yards, gun wharfs, magazines, &c., messengers and office-keepers in all establishments, and the crews of all Custom-house boats. If these situations were only obtainable through good service in the navy it would be an additional inducement for respectable men to join the service. I proposed this plan to the Manning Committee some years since, and I was informed that the Committee unanimously considered it to be 'sound and good.'"

Again Commander Gardner, of H.M.S. *Hannibal*, in his pamphlet recommending a somewhat similar organization for a reserve at p. 11 says,—"I will now enter into the proposition for forming an additional reserve of superior seamen for the fleet by a new organization of the system of riggers and labourers in our dockyards and ordinaries." He then goes on to detail his plan, and winds up his remarks by stating,—"In conclusion, I believe that by adopting the suggestions for holding a reserve of good seamen in our ports we should be enabled to place a strong force almost instanter in our outer roadsteads at the first symptom of alarm," &c., &c.

It is very gratifying for me to find that my humble suggestions for organizing and retaining a Naval Reserve, submitted eleven years ago (viz. in 1847), and repeated in 1852, are thus acknowledged and recommended by the highest authorities.*

Many parts of the system have already been carried out;—indeed, by subsequent Acts of Parliament and legislative enactments the whole measure has been more or less acted upon. The riggers are established, the Coast-guard brought under the Admiralty have now become a part of the fleet, and every seafaring man employed under the Crown—extending even to those on daily pay,—is subject to be called upon to serve in the Royal Navy in cases of emergency.

Under these circumstances we may well ask—Why, then, are we still without a substantial Reserve? The question is easily answered—*Because we have no well matured and well organized system.*

We shall do well to bring under review what our Reserve really does now consist of,—what number in the aggregate it amounts to,—and where we are to look for the remainder in order to complete the number proposed to be retained as our Reserve, viz. 10,000.

Coast-Guard, 7,000; probable number available for the Reserve	4,000
Seamen riggers and other dockyard labourers . .	2,000
Custom-house boatmen, &c.	1,500

* Captain Connolly, R.N., in a letter addressed to the Editor of the *U. S. G.* (7th of August last), alluding to his own pamphlet on manning the navy, urges the importance of having seamen in the Coast-guard as a Naval Reserve, and that there should be a rotation duty between service in the fleet and in the Coast-guard. Perhaps he was not aware that these ideas originated with Captain Sheringham as long ago as 1847, for we do know that they appeared in the paper to which he alludes in the commencement of his "Suggestions," printed in the vol. of this work for 1852.—Ed. *N. M.*

Thus we find that the number already employed under the Crown with power to embark them as a Naval Reserve amounts to 7,500 men, leaving only 2,500 to be added in order to complete the number. I apprehend that there would be no great difficulty in raising these by a small addition under each of the above heads, and by combining with them, as recommended by the Committee,—first, the surveying crews on home service, which may be estimated at nearly 500 men (if extended to its requisite amount for the proper performance of their duties in H. M. vessels), and, secondly, the crews employed in naval transports, which may be fairly estimated at 1,000 more.

The Report of the Committee states, under this head, at p. 24, cap. 96,—"Considering, in the event of an armament being required, the great importance of having as many seamen available in the Royal Navy as may be compatible with a due regard to economy, it appears to us desirable to employ seamen in the actual service of the Crown instead of hired men in all cases where such a course could be followed without prejudice to the service. It is stated by Mr. Grant, the Comptroller of Victualling and Transports, that there are upon an average about 1,500 who are now employed in hired merchant vessels for the conveyance of troops, the freight of stores, &c., and that this service could be as effectually performed by H. M. ships without any increase of expence. We recommend this subject," &c., &c.

There certainly is no very visible reason why these men, or at least a large portion of them, should not be made an available part of the Reserve. It possibly may not be expedient as a general rule to employ H. M. ships as transports, entailing, as it would, an expensive staff of officers, &c.; but I submit that it is worthy of the consideration of the Admiralty whether some arrangement might not be entered into with the parties who charter these ships to Government, that their crews, or part of them at least, should be reserved seamen, who might be required to sign articles binding themselves to serve in the Royal Navy in the event of a war, or in any case of emergency. As it would be advisable that these men should be thoroughly well trained in gunnery, &c., it would be expedient to embark an efficient naval officer in charge of them, whose duty it should be to act not only as agent afloat, but to keep an accurate list of the men belonging to the Reserve,—to make himself thoroughly acquainted with their characters and capabilities as seamen,—to see that their number was always complete,—and to superintend their drill, which should be punctually attended to at such times as might be compatible with their duties as part of the crew, under the sanction of the captain of the ship. In order to reconcile the men to this extra duty they might be paid, in addition to their wages, a bounty of £5 per annum while in Reserve, and employed in the merchant service, as proposed in my "Suggestions" in the *Naut. Mag.* for May, 1852, p. 242. When the services of the Reserve were required it would be the duty of the officer in charge to give notice to the captain that it was his intention to withdraw the reserve men from the ship within a certain period, in order to afford

him a sufficient time to supply their places if possible before they were drafted.

I entirely believe that some such system as this is not only feasible, but would prove a valuable source from which a large number of efficient seamen might be made available for the Reserve.

If it be conceded that a reserve of seamen should be retained in constant readiness by employing them in all Government situations which are compatible with their habits as seamen, as above recommended, it appears desirable, for the purpose of rendering the organization as perfect as possible—and intelligible to the men themselves, that *they should all be borne on some ship's books,—thus constituting them ostensibly—as they would be in reality—a part of the fleet, let their occupations while in reserve be what they may.* Under such a system, every man in the service would distinctly comprehend under what conditions he was serving, and *that to all intents and purposes he belonged to the fleet,* although his services would be dispensed with in a man-of-war as long, and only so long, as no case of emergency rendered it necessary that he should embark. Indeed, instead of entering the men as at present for that establishment in which they are seeking employment, they should be entered for the Reserve. Thus there would be two modes of entering the navy:—1. For active service afloat. 2. For the Reserve.

Whether or not the rotation system should be adopted in reference to service on shore and afloat, appears still to be a question in abeyance. I can only reiterate the opinion I have so often given,—that if the difficulties are not insurmountable in carrying it out, it would be a measure highly conducive to the efficiency of the service and to the comfort of the men, and I am confirmed in that opinion by the Report of the Manning Committee. For under the head of Rotation of Service Abroad and at Home, it says,—"With reference to that part of their Lordships' instructions which calls our attention to the practicability of adopting measures by which a period of service abroad might be followed by a term of service at home,—'We consider that a maintenance of a large proportion of the naval force at home which we have recommended, will facilitate the above desirable object in a manner that will be both satisfactory to the men and advantageous to the service.'"

With respect to the periodical drill of the Reserve, a subject of no small importance, there seems as yet to be no settled plan, a condition much to be lamented. A want of some regular system must be unsatisfory to the men and prejudicial to the service. It may be presumed that the difficulties, if any, would not be insuperable, of establishing a training muster roll for a certain number of months in the year, by which arrangement every man in the Reserve would know when he would be called upon. Some such system would have the twofold desirable effect,—1st., of greatly mitigating the inconvenience to the men by being withdrawn from their occupations and families, perhaps suddenly, and always at uncertain periods: and, 2ndly, it would guard against any serious interference with the duties of the establish-

ment in which they were serving, by the abstraction of a large and indefinite number of men at one time.

It is obvious that in the event of a sudden armament the Government establishments must not be paralyzed by withdrawing the Reserve without a due preparation being made to supply their places. It is admitted that this can in a great measure be effected by calling out the pensioners, which was suggested by myself in the *Naut. Mag.* May, 1852, p. 243, and recommended in the Committee's Report at p. 30, cap. 136, 137, 138, and 139; but in order to perfect the system and provide as far as possible that the right men should be in their right places, in addition to the suggestions of the Committee, I submit the expediency of having all pensioners duly registered for the situations they are to fill when called out, according to their qualifications; and that there should be not only correct lists of the men's names kept at the different establishments, but also that the nature of their employments should be fully explained to the men themselves at their quarterly musters, and stated on their pension tickets, such as—"pensioner seaman rigger," "pensioner custom-house boatman," "pensioner dockyard craft," &c. It may be found necessary to incur a small expence by the appointment of a competent staff, in order to insure accuracy and punctuality, and it is presumed that these officers might be selected from those on the out-pension of Greenwich Hospital.

In conclusion:—I am fully aware that I may have dealt very inadequately with this all important and most difficult subject; but the space I have already occupied in your Magazine reminds me that there must be a limit to my remarks; and however deficient they may be, I am not without hopes that some of my suggestions may lead to a good practical result. Neither would I part with the subject without expressing my humble tribute of admiration to the many excellent suggestions contained in the Manning Committee's Report. The valuable labours of those experienced officers in my opinion have not been duly appreciated; and had more of those suggestions been carried out, I firmly believe that the question at issue would by this time have been considerably reduced. But, alas, a mischievous and ill-advised economy will ever I fear paralyze the best exertions.

I sincerely hope that all future commissions on so weighty a subject as the consideration of the best means of securing the safety of our country under any adverse circumstances, will throw aside all questions of this kind, will alone search out diligently every weak point in the existing system of organizing a Royal Navy, and firmly name those remedies which in their deliberate judgment are called for, without even a passing word on their cost, leaving the responsibility of failure upon the Government and the country if they neglect to carry them out from any consideration of expence.

W. L. Sheringham, *Captain, R.N.*

To the Editor of the Nautical Magazine.

The Arsenal of Mare Island.

Mare Island, called also Jument Island, is in lat. 38° 6′ N., and 122° 12′ W., in St. Paul Bay, opposite to Luison Bay, into which the River Sacramento falls. These bays may be considered as a continuation of that of San Francisco, which must be entered to reach them.

In 1850 the Federal Government of the United States sent a commission to Mare Island, composed of naval and engineer officers, with the view of establishing a Naval Arsenal there. In accordance with the report of this commission, but not until 1854, did Congress decide on its construction, and works were commenced in October of that year. They are now going on with the greatest rapidity, and in a few years this arsenal will become one of the principal of the Union, and certainly the most important of the whole coasts of the Pacific Ocean. When completed, the number of buildings erected will be twenty-four, among which one will be destined for the construction of all kinds of machinery. This will be rectangular, the two longest sides being 1,160 feet, and the two others 700 feet, in the midst there being a large court, in which will be a reservoir.

The part destined for the forges is already completed, and contains 64: they have tubes from them led under ground to one principal chimney 124 feet in height, in which the draft is effected by means of communication with a steam engine of 40 h.p., destined to give motion to any part of the machinery that requires it. In the middle of all the forges and worked by the same engine is one of Nasmyth's hammers: it is 1,640 pounds weight, and can work the heaviest pieces. There will be four large stores, of which two are covered in already and nearly finished. They will be 400 feet long and 55 feet wide, two stories high, standing on vaulted arches. These buildings will be fire-proof, and are intended for stores of all kinds. Other buildings on the same large scale are to be erected by them for arms and workshops necessary for a maritime arsenal.

The officers' quarters are formed of three separate buildings. The commodore's residence consists of a large building of brick and granite is already finished. On each side of it will be six very handsome houses, also of brick and granite, several of which, already completed, are occupied by officers of the establishment. In front of these houses are esplanades 300 yards long and 100 wide. These are covered with turf and separated by roads paved with coal, which, when once cemented together, it is said will form a durable and solid mass.

A wet dock is already formed, 300 feet long and 150 wide, the bottom having a foundation of 4,500 piles, which support the masonry. The bottom and sides are of granite cemented together by beton.

Besides this there is an inclined rail on which the largest ships can be hauled up for repair by means of an hydraulic power.

A steamer of 2,000 tons belonging to the Panama line, with 500 tons of merchandize on board as well as all her stores and provisions, met with an accident on leaving the bay of San Francisco. She was

sent forthwith to Mare Island, and without landing anything, even one of her passengers or crew, was hauled up on the slip just as she was. In a few hours she was repaired and afloat again on her voyage.

Besides the wet dock and the inclined plane there are a number of works in preparation; among which is another enormous basin, round which are eight inclined rails for hauling up vessels on. This part alone is estimated to cost £60,000. The establishment also includes a rope-walk, 1,380 feet long, at one end of which is a steam-engine in a building 120 feet long by 70 wide, which will make its whole length 1,500 feet.

Attached to the whole a chapel is also to be built (100 feet long by 65 feet wide) for the use of the officers and men of the whole establishment.

A granite jetty, already commenced, and which will be a mile in length on the side which forms the part of the port nearest to the continent, from which the island is separated by an arm of the sea about a quarter of a mile wide, will facilitate the embarking and landing from the largest ships, which may lie alongside of it without any difficulty.

About a mile away from the principal buildings and to the East of the island is the powder manufactory, very nearly finished. It is 136 feet long and 65 feet wide, of brick and granite, and of a solidity to withstand the effect of the heaviest guns.

The cost of the works already effected amounts to £340,000, and those projected are estimated at £6,000,000 more; and although the work will cost an enormous sum and take many years to complete, the Americans consider that it will be the most perfect of the United States and perhaps in the whole world.

The works are carried on with the utmost vigour which they permit and the difficulty of obtaining workmen in a new country admits of.

The geographical position of Mare Island appears in every respect most advantageous. It is open to the whole Pacific Ocean, and entered from the bay of San Francisco by a narrow passage, called the Golden Gate. All the channels leading to it are safe and deep and easy of navigation, and capable besides of being so fortified as to be impregnable. A course of water which runs close to the arsenal by means of an aqueduct will supply abundance of that necessary for its wants as well as that of the shipping.

The port, which is formed naturally by Mare Island and the continent abreast of it, on which stands the little town of Vallejo, is sufficiently extensive to hold all the ships which may have occasion to haul to the jetty abovementioned. This port, which is easy of access and with complete shelter from every wind, has also excellent anchorage.

California and Oregon can supply the timber required for the construction of the largest ships from the keel to the masts; and in three or four months even now several steam ships can be built without having recourse to the Atlantic ports for anything more than the metal for the boilers and machinery.

The defences of the bay and port of San Francisco have already assumed a formidable character. At the entrance of the Golden Gate and on the right (coming from sea) on the most advanced point and completely commanding the passage, stands the Point Battery. This is constructed of enormous blocks of granite, pierced for 164 guns in three tiers, to be of the heaviest calibre. Having passed this point and being abreast of Isle Alcatraz, another fort is constructing, which, when completed, will mount 47 guns and several mortars.

A little further on, Angel Island, in the channel leading to Mare Island, near which a ship must pass, a fort of 50 guns is to be constructed. In fact, on the points named Lima, San Jose, and Presidio, inside the pass of the Golden Gate, between the Point Battery and Isle Alcatraz there will be three batteries *à fleur d'eau* of 50 guns each, and the fire from which will cross each other.

All the guns destined for these batteries are 68, 42, and 32 pounders from the best foundries in the United States. They are already at the place, and require only to be mounted on completion of the works. Up to this present time the Point Battery and the fort on Isle Alcatraz are in course of construction, and they will be completed in the course of the year. Congress has voted up to this present time £220,000 for Point Battery and £170,000 for that of Isle Alcatraz; but it is considered that two or three millions more will be required to complete them.

Atlantic Islands.

The Spanish Government has sent orders to Cadiz to fit out a certain number of ships of war to reinforce their squadron on the Western coast of Africa, with the view of protecting their commerce, and at the same time has directed the formation of an establishment on their own island of Fernando Po. The Chambers of Commerce have been notified of this fact by a circular from the Minister of Marine, who invites them to consider the subject, and to point out to Spanish merchants the numerous advantages they would derive from establishing a trade on the African coast. The ships, which will sail from Cadiz, will embark a certain number of ecclesiastics, who will found a religious mission at Fernando Po, the operations of which will be highly favourable to the Court of Madrid.

The island of Fernando Po, or rather Fernao do Po, is situated in the gulf of Biafra, which forms the interior of the gulf of Guinea. It was discovered with other lands in the same parts in 1472, by a gentleman of the Court of Alphonzo the Fifth, King of Portugal, who named it Belle Isle or Formosa. It was from the first annexed to the possessions of the Court of Lisbon, which held it for nearly three centuries. It was ceded to Spain in 1778, to which country it has

ever since belonged. It is forty miles long and twenty miles broad; the land is lofty, contains some fine forests, and a great number of productions most favourable to commerce. Among these are the sugar cane, cotton, tobacco, manioc, potato, and spices in common use.

The population of the island is composed of Mulattoes, Negroes, and a few Europeans. The island was formerly the resort of a wandering dangerous people, but of late has been much improved, and no great force is required to secure respect among them and preserve order. Labour in husbandry may easily be obtained from the liberated slaves of the African coast.

It has been erroneously stated that the island was formerly ceded by Spain to England. The Spanish Government in 1814 merely gave Great Britain permission to form an establishment at the West end of it, which received the name of Clarence, and is little more than commenced.

For some years two of the houses of this place have exhibited the magnificent woods for building which the island contains. One of them has even established a slipway and built ships. The English, who have received no assistance from the natives, have employed from the Coast Negroes called Kroomen, an industrious and intelligent race, who derive advantage from the pilotage of the rivers of the island, the number of which is considerable.

There is another island, named Annobon, in these parts belonging to Spain, which was discovered by the Portuguese on the 1st of January, 1473, and ceded by them to the Spaniards at the same time as Fernando Po. It is about ten miles in circumference, high, and abounding in fertile valleys surrounding the mountains, ornamented with a rich and perpetual verdure. The population of this island does not exceed 800 or 900; it has the same productions as Fernando Po, and is capable of as much improvement. Unfortunately, it has but one anchorage, which is situated in the northern part of the island.

The same group includes, besides Annobon and Fernando Po, Princes and St. Thomas Isles,—Princes Island was formerly the focus of trade. The English established their principal cruizers there, and the chief town, St. Antonio, has not yet lost its former character. The great drawback which these islands suffer from is their unhealthy climate. Fernando Po still labours under this disadvantage, but some healthy parts are found there, and others, by a well understood system of colonization may be improved. This evil may be overcome, and if the Spaniards can achieve this they will hold a most advantageous position on the Western coast of Africa, where Europern commerce has been for many years actively carried on. All these islands are situated in the Atlantic Ocean, where the English have two well known possessions, viz., Ascension and St. Helena, the latter of which has an imperishable name in history.

The French Government, in order to honour the memory o the Emperor, has sent M. Gautier de Rougement to this island wit[f] the title of Guardian Conservator of the Emperor's tomb. He will have the honourable mission of taking charge of the residence formerly

occupied by Napoleon. The Emperor's house will be renewed and restored at the expense of France.

These places, celebrated in history, will then be consecrated by a durable monument, and preserved in future by an old companion in arms of the Emperor. One cannot but approve of this noble and touching idea. M. Rougement embarked on the 5th of April with his family to proceed to his post in the *Normand* from Southampton.

Moniteur de la Flotte.

The Danish Fleet.

The Danish Fleet at present consists of the following ships of war:

1. Four ships of the line, viz.: The *Skjold*, *Frederick VI.*, and the *Vlademir*, of 84 guns each (they were built in 1828, 1831, and 1833), and the *Danebrog*, of 72 guns (built in 1850).

2. Six frigates: The *Dronning Marie*, of 60 guns, razee; the *Thetis*, *Bellona*, *Harfnan*, *Rota*, and *Torderaskjold*, of 46 to 48 guns each.

3. Three screw frigates, viz.: *Nielsjunt*, 300 h.p., and 42 guns; *Sjolland*, of the same size (building), and another steam frigate at present in course of construction.

4. Four corvettes of 26, 20, 14, and 12 guns.

5. Two screw corvettes, the *Heimdal* and *Thor*, of 260 h.p. each.

6. Four brigs, two schooners and a cutter.

7. Six (paddle) steamers, viz.: The *Holger Danske*, of 560 h.p., and 7 guns; the *Sleswig*, of 240 h.p., and 12 guns (for the service of his Majesty); the *Hecla*, of 200 h.p., and 8 guns; the *Skirner*, of 150 h.p., and 2 guns; the *Ogir*, of 80 h.p., and two steam gunboats.

To the above steamers must be added two other small ships called the *Uffs* and *Hertha;* fifty-seven gunboats, and twenty-seven transports.

In 1857, the mercantile fleet of Sleswig was 1,530 ships, making 53,342 tons. There are also twelve steam-vessels of 722 and 526 h.p.

The Atlantic Telegraph Cable.—*Voyage of H.M.S. Agamemnon.*

[A narrative of the *Agamemnon's* proceedings in laying her half of the Atlantic Cable is so important as a matter of history besides being interesting as a matter of fact, that we preserve in our own pages the following from those of the *Daily News.* By the exertions of all to whom the difficult task was assigned, a duty has been performed in

spite of those difficulties known best to themselves, that will ever be highly creditable to them,—and sincerely do we congratulate them as well as all the world in having accomplished this first feat in laying down deep sea telegraph cables.—ED.]

1. As your readers have already been informed by telegraph, the submarine communication between the Old and the New Worlds is now an accomplished fact. In the face of difficulties and dangers, the magnitude of which cannot be properly appreciated by those not engaged in the work, the engineers employed in this undertaking have, with almost untiring energy, adhered to their all but hopeless task with that perseverance which is sure, sooner or later, to lead to success. There were but few, some twenty days ago, who, after the unsuccessful return of the squadron to Queenstown, would have dared to predict such a speedy and glorious termination to all the trials and difficulties that the promoters of this undertaking have undergone. The final accomplishment of the scheme seemed, indeed, up to the last moment, to hang upon a hair. Many serious difficulties had to be encountered during the six days and a half that the operations lasted, any one of which, had not chance favoured us, might have ruined the expedition and delayed the advance of ocean telegraphs perhaps more than half a century. But the difficult task has now been accomplished, and it but remains for us to accept the benefits which it will undoubtedly confer upon the community.

2. Wonderful as the conception of conveying sensations from continent to continent, across the almost unknown depths of the ocean, may seem to us now, yet in a very little time people will forget the marvel while profiting by the fact, and without remembering the years of anxious toil and discouragement which those who have secured this boon to the community have undergone to achieve success. The wonder will be then, not that the undertaking has been carried out at all, but that it had not been accomplished long before. It has been the custom of mankind to honour the lives and celebrate the deeds of great statesmen, successful warriors, and eminent divines. Indeed, of such materials are the links in the chain of history chiefly composed. But those men who, by patient thought and persevering action, have achieved those victories over matter which secure to the community permanent advantage, very often have their trouble for their reward. It is to be hoped that this may not be the case with those who have been mainly instrumental in bringing this great enterprise to a successful termination.

3. It must be confessed that the prospects of success were very remote when the squadron left Queenstown on the 17th of last month. The amount of cable in the two ships had been reduced by nearly 400 miles, and the occurrence of three separate and most unaccountable breakages was still fresh in the minds of all who had accompanied the first expedition, and there was no reason whatever for supposing that the very same thing might not occur again. The cable might, and evidently did as far as the contractors are concerned, fulfil all the

guaranteed requirements, and the numerous accidents which occurred might be due to the cable having become injured during the gale. This supposition, though it may be gratifying to Messrs. Glass and Co., was no consolation to either the engineers or the shareholders. Under these circumstances, it is not surprising that many regarded the prosecution of the scheme as a waste of shareholders' money. However, in spite of the most vehement opposition, the majority of the Directors determined to despatch the expedition to try their fortune again in mid-ocean before they abandoned the scheme altogether as impracticable.

4. Accordingly, on the morning of Saturday the 17th of July, the *Valorous*, *Gorgon*, and *Niagara*, having completed coaling, steamed away from Queenstown for the rendezvous. The *Agamemnon*, having to wait for Professor W. Thomson, one of the directors, who took charge of the electrical department on board, did not way anchor until two o'clock on the following morning. As the ships left the harbour there was apparently no notice taken of their departure by those on shore, or in the vessels anchored round them; every one seemed impressed with the conviction that we were engaged in a hopeless enterprise, and the squadron seemed rather to have slunk away on some discreditable mission than to have sailed for the accomplishment of a grand national scheme.

5. It was just dawn when the *Agamemnon* got clear of Queenstown Harbour; but, as the wind blew stiffly from the S.W., it was nearly ten o'clock before she rounded the Old Head of Kinsale, a distance of only a few miles. The weather remained fine during the day, and as the *Agamemnon* skirted along the wild and rocky shore of the South-West coast of Ireland those on board had an excellent opportunity of seeing the stupendous rocks which rise from the sea in the most grotesque and fantastic shapes. About five o'clock in the afternoon Cape Clear was passed, and though the coast gradually edged away to the Northward of our course, yet it was nearly dark before we lost sight of the high and rocky mountains which surround Bantry Bay and the shores of the Kenmare River. By Monday morning, the 19th, we had left the land far behind us, and from thence fell into the usual dull monotony of sea life.

6. Of the voyage out there is little to be said. It was not varied by the excitement of continual storms, nor the tedium of perpetual calms, but we had a sufficient admixture of both to render our passage to the rendezvous a very ordinary and uninteresting one; indeed for the past week the barometer remained unusually low, and the numbers of those natural barometers, mother Carey's chickens, that followed in our wake, kept us in continual expectation of heavy weather. With every little breeze of wind the screw was got up, and sail made, so as to husband our coals as much as possible; but it generally soon fell calm again, and obliged our commander reluctantly to get up steam. In consequence of these continued delays and changes from steam to sail, and from sail to steam again, much fuel was expended, and not more than eighty miles of distance made good each day. On

Sunday the 25th, however, the weather changed, and for several days in succession there was an uninterrupted calm. The moon was just at the full, and for several nights it shone with a brilliancy turning the smooth sea into one silvery sheet, which brought out the dark hull and white sails of the ship in strong contrast to the sea and sky, as the vessel lay all but motionless on the water, the very impersonation of solitude and repose. Indeed until the rendezvous was gained we had such a succession of beautiful sunrises, gorgeous sunsets, and tranquil moonlight nights, as would have excited the most enthusiastic admiration of any one but persons situated as we were. But by us such scenes were regarded only as the annoying indications of the calm which delayed our progress and wasted our coals.

7. In spite of the unusual calmness of the weather in general, there were days on which our former unpleasant experiences of the Atlantic were brought forcibly to our recollection, when it blew hard, and the sea ran sufficiently high to reproduce on a minor scale many of the discomforts of which the previous cruize had been so fruitful. These days, however were the exception, and not the rule, and served to show how much more pleasant was the inconvenient calm than the weather which had previously prevailed. By dint, however, of a judicious expenditure of fuel, and a liberal use of the cheaper motive power of sail, the rendezvous was reached on the evening of Wednesday, the 28th of July, just eleven days after our departure from Queenstown. The rest of the squadron were in sight at nightfall, but at such a considerable distance that it was past ten in the morning of Thursday, the 29th, before the *Agamemnon* joined them. We were, as usual, greeted by a perfect storm of questions as to what kept us so much behind our time, and learned that all had some to the conclusion that the ship must have got ashore on leaving Queenstown Harbour. The *Niagara*, it appeared, had arrived on the rendezvous on Friday night, the 23rd; the *Valorous* on Sunday, the 25th; and the *Gorgon* on the afternoon of Tuesday, the 27th. The day was beautifully calm, so no time was to be lost before making the splice; boats were soon lowered from the attendant ships, the two vessels were made fast by a hawser, and the *Niagara* end of the cable conveyed on board the *Agamemnon*. About half-past twelve o'clock the splice was effectually made, but with materials very different. Instead of carefully rounded semicircular boards which had been used to enclose the junctions on previous occasions, it consisted merely of two straight boards nailed over the joining, with the iron rod and leaden plummet attached to the centre. In hoisting it out over the side of the ship, however, the leaden sinker broke short off, and fell overboard, and there being no more convenient weight at hand, a 32lb. shot was fastened to the splice instead, and the whole apparatus was quickly dropped into the sea without any formality, and indeed almost without a spectator, for those on board the ship had witnessed so many beginnings to the telegraphic line, that it was evident that they despaired of there ever being an end to it.

8. The stipulated 200 [? 2,000 or more] fathoms of cable having been

payed out to allow the splice to sink well below the surface, the signal to start was hoisted, the hawser cast loose, and the *Niagara* and *Agamemnon* started for the last time for their opposite destinations. For the first three hours the ships proceeded very slowly, paying out a great quantity of slack; but after the expiration of this time the speed of the *Agamemnon* was increased to about five knots per hour, the cable going at about six, without indicating more than a few hundred pounds of strain upon the dynamometer. Shortly after six o'clock a very large whale was seen approaching the starboard bow at a great speed, rolling and tossing the sea into foam all around, and for the first time we felt the possibility of the supposition that our second mysterious breakage of the cable might have been caused, after all, by one of these animals getting foul of it under water. It appeared as if it were making direct for the cable, and great was the relief of all when the ponderous living mass was seen slowly to pass astern, just grazing the cable where it entered the water, but fortunately without doing any mischief. All seemed to go well up to about eight o'clock; the cable payed out from the hold with an evenness and regularity which showed how carefully and perfectly it had been coiled away; and to guard against accidents which might arise in consequence of the cable having suffered injury during the storm, the indicated strain upon the dynamometer was never allowed to get beyond 1,700 lbs., or less than one quarter what the cable is estimated to bear. Thus far everything looked promising of success. But in such a hazardous work no one knows what a minute may bring forth, for soon after eight an injured portion of the cable was discovered about a mile or two from the portion paying out. Not a moment was lost by Mr. Canning, the engineer on duty, in setting men to work to cobble up the injury as well as time would permit, for the cable was going out at such a rate that the damaged portion would be payed overboard in less than twenty minutes, and former experience had shown us that to check either the speed of the ship or the cable would in all probability be attended by the most fatal results.

9. Just before the lapping was finished, Professor Thomson reported that the electrical continuity of the wire had ceased, but that the insulation was still perfect. Attention was naturally directed to the injured piece as the probable source of the stoppage, and not a moment was lost in cutting the cable at that point, with the intention of making a perfect splice; but, to the consternation of all, the electrical tests applied showed the fault to be overboard, and in all probability some fifty miles from the ship. Not a second was to be lost, for it was evident that the cut portion must be payed overboard in a few minutes, and in the mean time the tedious and difficult operation of making a splice had to be performed. The ship was immediately stopped and no more cable payed out than was absolutely necessary to prevent it breaking. As the stern of the ship was lifted by the waves a scene of the most intense excitement followed. It seemed impossible, even by using the greatest possible speed and paying out the least possible amount of cable, that the junction could be finished before the

part was taken out of the hands of the workman. The main hold presented an extraordinary scene. Nearly all the officers of the ship and of those connected with the expedition stood in groups about the coil, watching (with that intense anxiety which is seldom seen except round foreign gaming tables) the cable as it slowly unwound itself nearer and nearer the joint, while the workmen, directed by Mr. Canning, under whose superintendence the cable was originally manufactured, worked at the splice as only men could work who felt that the life and death of the expedition depended upon their rapidity.

10. But all their speed was to no purpose, as the cable was unwinding within a hundred fathoms, and as a last and desperate resource the cable was stopped altogether, and for a few minutes the ship hung on by the end. Fortunately, however, it was only for a few minutes, as the strain was continually rising above two tons, and it could not hold on much longer, when the splice was finished, the signal made to loose the stopper, and it passed overboard safely enough. When the excitement consequent upon having so narrowly saved the cable had passed away, we woke to the consciousness that the case was still as hopeless as ever, for the electric continuity was still entirely wanting. Preparations were consequently made to pay out as little cable as possible, and to hold on for six hours, in hope that the fault, whatever it might be, might mend itself before cutting the cable and returning to the rendezvous to make another splice. The magnetic needles on the receiving instruments were watched closely for the returning signals, when in a few minutes the last hope was extinguished, by their suddenly indicating "dead earth," which tended to show that the cable had broken from the *Niagara*, or that the insulation had been completely destroyed. In three minutes, however, every one was agreeably surprised by the intelligence that the stoppage had disappeared, and that the signals had again appeared at regular intervals from the *Niagara*.

11. It is needless to say what a load of anxiety this news removed from the minds of every one; but the general confidence in the ultimate success of the operations was much shaken by the occurrence, for all felt that at any minute a similar accident might occur. For some time the paying out continued as usual; but towards the morning another damaged place was discovered in the cable. There was fortunately, however, time to repair it in the hold without in any way interfering with the operations, beyond for a time slightly reducing the speed of the ship.

12. During the morning of Friday the 30th, everything went well; the ship had been kept at the speed of about five knots, the cable was going out at about six, the average angle with the horizon at which it left the ship being about 15°, while the indicated strain upon the dynamometer seldom showed more than 1,600 to 1,700 lbs. Observations made at noon showed that we had made good seventy-eight miles from the starting point since the previous day, with an expenditure, including the loss in lowering the splice and during the subsequent stoppages, of one hundred and thirty-five miles of cable. During the

latter portion of the day the barometer fell considerably, and towards this evening it blew almost a gale of wind from the eastward, dead ahead of our course. As the breeze freshened, the speed of the engines was gradually increased, but the wind more than increased in proportion, so that before the sun went down the *Agamemnon* was going full steam against the wind, and only making a speed of about four knots an hour. During the evening topmasts were lowered, and spars, yards, sails, and indeed everything aloft that could offer resistance to the wind was sent down on deck; but still the ship made but little way, chiefly in consequence of the heavy sea.

13. The enormous quantity of fuel consumed showed us that if the wind lasted we should be reduced to burning masts, spars, and even the decks, to bring the ship into Valentia. It seemed to be our particular ill fortune to meet with head-winds whichever way the ship's head was turned. On our journey out we had been delayed, and obliged to consume an undue proportion of coal, for want of an easterly wind, and now all our fuel was being wasted because of it. However, during the latter part of the day the wind gradually went round to the S.W., which, though it raised a very heavy sea, yet allowed us to husband our small remaining store of fuel.

14. On Saturday, the 31st of July, observations at noon showed us to be in lat. 52° 23′ N., and long. 26° 44′ W., having made good 120 miles of distance from the starting point since noon of the previous day, with a loss of about 27 per cent. of cable. The *Niagara*, as far as could be judged from the amount of cable she had payed out, which, by a previous arrangement, was signalled at every ten miles, kept pace with us, within one or two miles, the whole distance across. During the afternoon of Saturday, the wind again freshened up, and before nightfall it again blew nearly a gale, and a tremendous sea ran before it from the S.W., which made the *Agamemnon* pitch to such an extent that it was thought impossible that the cable could hold on through the night. Indeed, had it not been for the constant care and watchfulness exercised by Mr. Bright, and the two energetic engineers, Mr. Canning and Mr. Clifford, who acted with him, it could not have been done at all. Men were kept at the wheels of the machine to prevent them stopping, as the stern of the ship rose and fell with the sea, for had they done so, the cable must undoubtedly have parted. During Sunday the sea and wind increased, and before the evening it blew a smart gale. Now, indeed, were the energy and activity of all engaged in the operations taxed to the utmost. Mr. Hoar and Mr. Moore, the two engineers who had the charge of the releasing wheels of the dynamometer, had to keep watch and watch alternately every four hours, and while on duty not daring to let their attention be removed from their occupation for one moment, for on their releasing the brakes every time the stern of the ship fell into the trough of the sea entirely depended the safety of the cable, and the result shows how ably they have discharged their duty. Throughout the night there were few who had the least expectation of the cable holding on till morning, and many remained awake listening for the sound that

all most dreaded to hear, viz., the gun which should announce the failure of all our hopes; but still the cable—which in comparison with the ship from which it was payed out, and the gigantic waves among which it was delivered, was but a mere thread—continued to hold on, only leaving a silvery phosphoric line upon the stupendous seas as they rolled on towards the ship.

15. With Sunday morning came no improvement in the weather. Still the sky remained black and stormy to windward, and the constant violent squalls of wind and rain which prevailed during the whole day served to keep up, if not to augment, the height of the waves. But the cable had gone through so much during the night that our confidence in its continuing to hold was much restored. At noon, observations showed us to be in lat. 52° 26′ N., and long. 23° 16′ W., having made good 130 miles from noon of the previous day and about 350 from our starting point in mid ocean. We had passed by the deepest sounding of 2,400 fathoms, and over more than half of the deep water generally, while the amount of cable still remaining in the ship was more than sufficient to carry us to the Irish coast, even supposing the continuance of the bad weather should oblige us to pay out the same amount of slack cable we had been hitherto wasting. Thus far things looked very promising for our ultimate success. But former experience showed us only too plainly that we could never be sure that some accident might not arise until the two ends had been safely landed on the opposite shores.

16. During Sunday night and Monday morning the weather continued as boisterous as ever, and it was only by the most indefatigable exertions of the engineer upon duty that the wheels could be prevented from stopping altogether, as the vessel rose and fell with the sea, and once or twice they did come completely to a standstill, in spite of all that could be done to keep them moving. Fortunately they were again set in motion before the stern of the ship was thrown up by the succeeding wave. The dynamometer occasionally registered 1,700 lbs. as the ship lifted, though it was oftener below 1,000, and was frequently nothing at all, the cable running out as fast as its own weight and the speed of the ship would draw it. But even with all these forces acting unresistingly upon it, the cable never payed itself out at a greater speed than eight knots an hour, and at the time the ship was going at the rate of six to six and a half knots. Subsequently, however, when the speed of the ship was increased to six and a half knots, the cable never ran out so quickly. The average speed maintained by the ship up to this time, and indeed for the whole voyage, was about five and a half knots, the cable, with occasional exceptions, running about 30 per cent. faster.

17. At noon, on Monday, August 2nd, observations showed us to be in lat. 52° 35′ N., long. 19° 48′ W., having made good 127½ miles since noon of the previous day, and which was more than half way to our ultimate destination. During the afternoon an American three-masted barque, which afterwards proved to be the *Chieftain*, was seen standing from the eastward towards us. No notice was

taken of her at first; but when she was within about half a mile of the *Agamemnon* she alter her course, and bore right down across our bows. A collision which might prove fatal to the cable now seemed inevitable, or could only be avoided by the equally hazardous expedient of altering the *Agamemnon's* course. The *Valorous* steamed ahead, and fired a gun for her to heave to, which, as she did not appear to take much notice of, was quickly followed by another from the bows of the *Agamemnon*, and a second and third from the *Valorous;* but still the vessel held on her course, and, as the only resource left to avoid a collision, the course of the *Agamemnon* was altered just in time to pass within a few yards of her. It was evident that our proceedings were a source of the greatest possible astonishment to them, for all her crew crowded upon the deck and rigging. At length they evidently discovered who we were and what we were doing; the crew manned the rigging, and dipping the ensign several times they gave us three hearty cheers. Though the *Agamemnon* was obliged to acknowledge these congratulations in due form, the feelings of annoyance with which we regarded the vessel which, either by the stupidity or carelessness of those on board, was so near adding a fatal and unexpected mishap to the long chapter of accidents which we had already encountered, may easily be imagined. To those below, who of course did not see the ship approaching, the sound of the first gun came like a thunderbolt, for all took it as the signal of the breaking of the cable. The dinner tables were deserted in a moment, and a general rush made up the hatches to the deck; but before reaching it their fears were quickly banished at the report of the succeeding guns, which all knew well could only be caused by a ship in our way, or a man overboard.

18. Throughout the greater portion of Monday morning the electrical signals from the *Niagara* had been getting gradually weaker, until they ceased altogether for nearly three quarters of an hour. Our uneasiness, however, was in some degree lessened by the fact that the stoppage appeared to be a want of continuity, and not any defect in insulation, and there was consequently every reason to suppose that it might arise from faulty connexion on board the *Niagara*. Accordingly, Professor Thomson sent a message to the effect that the signals were too weak to be read; and, as if they had been awaiting such a signal to increase their battery power, the deflexions immediately returned even stronger than they had ever been before. Towards the evening, however, they again declined in force for a short time. With the exception of these little stoppages, the electrical condition of the submerged wire seemed to be much improved. It was evident that the low temperature of the water at the immense depth increased considerably the insulating properties of the gutta percha, while the enormous pressure to which it must have been subjected probably tended to consolidate its texture, and to fill up any air bubbles or slight faults in manufacture which may have existed.

19. The weather during Monday night moderated a little, but still there was a very heavy sea on, which endangered the wire every second

minute. About three o'clock on Tuesday morning all on board were startled from their beds by the loud booming of a gun; every one, without waiting for the performance of the most particular toilet, rushed on deck to ascertain the cause of the disturbance. Contrary to all expectation the cable was safe; but just in the grey light could be seen the *Valorous*, rounded to in the most warlike attitude, firing gun after gun in quick succession toward a large American barque, who, being quite unconscious of our proceedings, was standing right across our stern. Such loud and repeated remonstrances from a large steam-frigate were not to be despised, and evidently without knowing the why or the wherefore, she quickly threw her sails aback and remained hove to. Whether those on board her considered that we were engaged in some filibustering expedition, or regarded our proceedings as a matter of British interference with the American flag, it is impossible to say; but certain it is that, apparently in great trepidation, she remained hove to until we had lost sight of her in the distance. Tuesday was a much finer day than any we had experienced for nearly a week, but still there was a considerable sea running, and our dangers were far from past. Yet the hopes of our ultimate success ran high. We had accomplished nearly the whole of the deep sea portion of the route in safety, and that, too, under the most unfavourable circumstances possible, therefore there was every reason to believe that unless some unforeseen accident should occur, we should accomplish the remainder. Observations at noon placed us in lat. 52° 26′ N., long. 16° 7′ 40″ W., having run 134 miles since the previous day.

20. About five o'clock in the evening the steep submarine mountain which divides the telegraphic platform from the Irish coast was reached, and the sudden shallowing of the water had a very marked effect upon the cable, causing the strain on and the speed of it to lessen every minute. A great deal of slack was payed out to allow for any greater inequalities which might exist, though not discovered by the sounding line. About ten o'clock the shoal water of 250 fathoms was reached. The only remaining anxiety now was the changing from the lower main coil to that upon the upper deck, and this most difficult and dangerous operation was successfully performed between three and four o'clock on Wednesday morning. Wednesday was a beautifully calm day; indeed it was the first on which any one would have thought of making a splice since the day we started from the rendezvous. We therefore congratulated ourselves on having saved a week by commencing operations on the Thursday previous. At noon we were in lat. 52° 11′ N., long. 12° 40′ 2″ W., eighty-nine miles distant from the telegraph station at Valentia. The water was shallow, so that there was no difficulty in paying out. We were almost without any loss by slack, and all looked upon the undertaking as virtually accomplished.

21. At about one o'clock in the morning the second change from the upper deck coil to that upon the orlop deck was safely effected, and shortly after the vessels exchanged signals that they were in 200

fathoms water. As the night advanced the speed of the ship was reduced, as it was known that we were only a short distance from the land, and there would be no advantage in making it before daylight in the morning. About twelve o'clock, however, the Skelligs Light was seen in the distance, and the *Valorous* steamed on ahead to lead us into the coast, firing rockets at intervals to direct us, which were answered from the *Agamemnon;* though, according to the directions of Mr. Moriarty, the Master, the ship, disregarding the *Valorous*, kept her own course, which proved to be the right one in the end.

22. By daylight in the morning of Thursday, the bold and rocky mountains which entirely surround the wild and picturesque neighbourhood of Valentia, rose right before us at a few miles' distance. Never, probably, was the sight of land more welcome, as it brought to a successful termination one of the greatest, but, at the same time, one of the most difficult, enterprises which was ever undertaken. Had it been the dullest and most prosaic landscape on the face of the earth that lay before us, we should have found it a pleasant prospect. But as the sun rose from the estuary of Dingle Bay, tinging with a deep soft purple the lofty summit of the steep mountains which surround its shore, and illuminating the masses of morning vapour which hung upon them, it was a scene which might vie in beauty with anything that could be produced by the most florid imagination of an artist.

23. No one on shore was apparently conscious of our approach, so the *Valorous* steamed ahead to the mouth of the harbour, and both ships made straight for Dowlas Bay, and about six o'clock came to an anchor at the side of Beginnes Island, opposite to Valentia. As soon as the inhabitants became aware of our approach, there was a general sensation in the place, and hundreds of boats crowded round us, their passengers in the greatest state of excitement to hear all about our voyage. The Knight of Kerry was absent in Dingle, but a messenger was immediately despatched for him, and he soon arrived in her Majesty's gunboat *Shamrock*. Soon after our arrival a signal was received from the *Niagara* that they were preparing to land, having payed out 1,030 nautical miles of cable, while the *Agamemnon* had accomplished her portion of the distance with an expenditure of 1,020 miles, making the total length of the wire submerged 2,050 geographical miles. Immediately the ships cast anchor, the paddle-box-boats of the *Valorous* were got ready, and two miles of cable coiled away within for the purpose of landing the end; but it was late in the afternoon before the procession of boats left the ship under a salute of three rounds of small arms from the department of marines on board the *Agamemnon*, under the command of Lieutenant Norris.

24. The progress of the end to the shore was very slow, in consequence of the very stiff wind which blew at the time; but at about three o'clock the end was safely brought on shore at Kingstown, Valentia, by Mr. Bright and Mr. Canning, the chief and second engineers, to whose exertions the success of the undertaking is attribut-

able, and the Knight of Kerry. The end was immediately laid in the trench which had been made to receive it; while a royal salute, making the neighbouring rocks and mountains reverberate, announced that the communication between the Old and New Worlds had been completed. The end was immediately taken into the electrical room by Mr. Whitehouse, and attached to a galvanometer. The first message was received through the entire length.

25. Too much praise cannot be bestowed upon both the officers and crew of the *Agamemnon*, for the hearty way in which they have achieved the arduous and difficult service they have been engaged in, and the admirable manner in which the ship was navigated by Mr. Moriarty and Mr. Libbey, the first and second masters, amid the difficulties of the company's operations. It will in all probability be nearly a fortnight before the instruments are connected up at the termini for the transmission of regular signals. It is unnecessary here to expatiate on the magnitude of the undertaking which has been just completed, and on the great political and social results which are likely to arise from it; but there cannot be but one feeling of universal admiration for the courage and perseverance which has been displayed by Mr. Bright and those who acted under his orders, in encountering the manifold difficulties which beset their path at every step.

[The following, which appeared in the same paper of the 18th, is a worthy conclusion of the subject for the present, to which, however, we shall have occasion to allude in another number.]

Messages to and fro.

Chief Office, 22, Old Broad Street, London.

Sir,—I have the pleasure to inform you that the line from Valentia to Newfoundland is now working satisfactorily both ways. The following message was despatched yesterday evening from the Directors in England to the Directors in America:—

"Europe and America are united by telegraph. Glory to God in the Highest: on earth peace, goodwill towards man."

This message, including the addresses of senders and receivers, occupied thirty-five minutes in transmission, and consisted of thirty-one words. Immediately afterwards a message from her Majesty the Queen to his Excellency the President of the United States, consisting of ninety-nine words, was received by Newfoundland in sixty-seven minutes. Both messages were repeated back to Valentia to test their accuracy, and were found to have been taken with great exactness. Of course, unless permission were given, the contents of her Majesty's despatch cannot be made public.

This morning we have the following message, the last thirty-eight words of which were received in twenty-two minutes, from Mr. Cyrus W. Field, who is at Newfoundland:—

"Cyrus W. Field, Newfoundland, to Directors Atlantic Telegraph Company, London.—Newfoundland, Monday.—Entered Trinity Bay,

noon of the 5th. Landed cable on the 6th. On Thursday morning ship at once to St. John's. Two miles of shore cable, with end ready for splicing.

"When was cable landed at Valentia? Answer by telegraph and forward my letters to New York."

It will thus be seen that the line is now capable of being worked with perfect accuracy, and the company will now proceed, as rapidly as is consistent with the establishment of a proper system, to make the necessary arrangements for opening the communication to the public, in doing which, however, some delay must necessarily occur.

Yours truly,

GEORGE SAWARD,

Secretary and Manager.

To the Editor of the Daily News.

The following message was received yesterday morning from Valentia:—

"We are now receiving from Newfoundland accurately, with perfect signals, at the rate of one hundred words per hour."

THE FETES AT CHERBOURG.

[We avail ourselves of the narrative given by the Special Correspondent of the *Daily News*, for the following brief review of the proceedings at Cherbourg on the occasion of the visit to that place of her Majesty Queen Victoria. It is with pleasure we add that the consideration of the Admiralty in placing two steamers at the disposal of our naval officers to visit Cherbourg, was met by the marked attention of the Emperor in giving orders that they should be allowed access to every part of the scene of the proceedings,—the naval uniform being sufficient passport.]

Cherbourg, August 5th.

Her Majesty the Queen and the Prince Consort, accompanied by the Prince of Wales and the Duke of Cambridge, arrived at Cherbourg, in the royal yacht *Victoria and Albert*, at five minutes past six o'clock yesterday evening.

In attendance upon her Majesty were the Countess of Desart, Lady in Waiting, the Hon. Mary Bulteel, Maid of Honour, the Earl Delawarr, Lord Chamberlain, the Earl of Malmesbury, Foreign Secretary, Sir John Pakington, First Lord of the Admiralty, Colonel the Hon. Sir C. Phipps, Colonel the Hon. A. Hood, Equerry to her Majesty, Captain Du Plat, Equerry to the Prince Consort, Viscount Valletort, in attendance upon the Prince of Wales, Colonel Tyrwhitt and Colonel Chapman, Aides-de-camp to the Duke of Cambridge.

Immediately upon the Queen's arrival Admiral Hamelin, Minister of Marine, was sent on board the royal yacht by the Emperor to congratulate her Majesty upon her arrival.

Earl Cowley and Countess Cowley, Viscount Chelsea, Secretary of Embassy, Mr. Hammond, British Consul, and Mr. Atlee, Private Secretary to Earl Cowley, paid their respects to her Majesty.

Marshal the Duc de Malakoff and Admiral Lord Lyons likewise came on board the *Victoria and Albert.*

At half-past eight o'clock the Emperor and Empress of the French, attended by a numerous suite, arrived on board the royal yacht.

Their Imperial Majesties were received, upon stepping from their barge, by the Prince Consort, and upon coming on deck by the Queen.

The Emperor and Empress returned on shore about ten o'clock.

6th.—The Queen and the Prince Consort, with the Prince of Wales and the Duke of Cambridge, landed at the docks at a quarter before twelve o'clock yesterday. In attendance were the Countess of Desart, the Hon. Mary Bulteel, their Excellencies the Earl and Countess Cowley, Colonel the Hon. A. Hood, Equerry in Waiting, Captain Du Plat, Equerry to the Prince Consort, the Hon. Sir C. Phipps, K.C.B., Viscount Valletort, in attendance upon the Prince of Wales, Colonel Tyrwhitt and Colonel Chapman, C.B., Aides-de-camp to the Duke of Cambridge.

The royal barge was steered by Captain the Hon. J. Denman. As her Majesty left the royal yacht, salutes were fired by the French and English ships of war, and salvoes of artillery from all the forts.

Upon reaching the quay her Majesty was received by the Emperor of the French, who handed her Majesty on shore, and conducted her to the Empress, who stood at the top of the steps.

The imperial and royal party and their suites then entered the carriages of his Imperial Majesty and were conducted to the Prefecture Maritime, where a dejeuner was prepared.

Subsequently their Majesties, with the other royal guests, drove to the Fort de la Carriere, and afterwards inspected the large basin of the docks.

In the evening the Queen, the Prince Consort, the Prince of Wales, and the Duke of Cambridge, with the ladies and gentlemen of the household, dined with the Emperor and Empress on board the French line of battle ship *La Bretagne.* Covers were laid for about seventy persons.

Later in the evening there was a brilliant display of fireworks.

The Queen and Prince returned with the Emperor and Empress, in his Imperial Majesty's barge, to the *Victoria and Albert.*

7th.—Yesterday, at about half-past eleven o'clock, the Emperor and Empress of the French proceeded in their state barge to take leave of the Queen, the Prince Consort, and the other royal personages. Their Imperial Majesties were attended by a numerous suite. After remaining on board the royal yacht the Emperor and Empress took their leave, and proceeded on board the French flag-ship *La*

Bretagne amidst salutes from all the ships, which had previously manned yards.

The *Victoria and Albert* immediately got on their way and steamed out to sea, escorted by the squadron of men-of-war under the command of Admiral Lord Lyons, and followed by the royal yachts.

Triple salutes were fired from the French ships of war, and frequent salvoes of artillery from the forts.

Her Majesty's yacht rounded the Breakwater at twelve minutes past noon.

Wednesday the 4th of August must certainly from henceforth be set down as the most brilliant of red-letter days in the calendar of Cherbourg. For to receive on the same day the most powerful Emperor and the most powerful Queen in the world was an honour which does not often fall to the lot of cities of much greater pretension. And Cherbourg seems to be fully alive to the extent of her good fortune, and has been exulting from an inconveniently early hour in the morning to an equally inconvenient hour in the evening.

Strangers have been pouring in for the whole week by road and rail, and knapsacks and portmanteaus and dusty travellers are stowed away everywhere in this place of many modern improvements, but situated in a very old-fashioned part of France; and therefore when the people take to merry-making they do it in a very old-fashioned sort of way. Cherbourg therefore excels in these old-fashioned ways. But the ships in the harbour display all their colours, and the innumerable yachts in the *rade* exhibit a similar decoration. In the town the people seem to have exhausted their whole stock of draperies, for every house is covered with an infinite variety of colours, arranged in that artistic manner with which the French know how to give effect to the humblest materials. Another marked peculiarity of the whole proceedings is the paucity of military display. There are a few Dragoons and Hussars, and a couple of regiments of the line, but the remainder of the force employed in keeping the streets consists entirely of the seamen of the fleet, who do their duty in that free and easy manner which is peculiar to Jack everywhere, performing some evolutions that are perfectly astonishing, when ordered to fall in or fall out, or wheel, or halt, as the exigency of the moment may require. They are evidently picked men, all light, strong, and active, with now and then a boatswain of terrific beard and stature. It would be difficult to distinguish them from English sailors but for the musket which each carries, and a certain strap with which each has his hat fastened under his chin, and which I don't think English Jack would wear for any possible amount of pay or prize money. The crowd fraternise with them in the most affectionate manner, and the way in which the ladies contrive to coax themselves within the lines is a sore trouble to the tall and venerable gendarmes, who, mounted on horses as tall and venerable as themselves, have the irksome duty of turning out all the pretty bonnets and *mousquetaire* hats which Jack had in his benevolence admitted. The roadway on

each side is densely crowded with working people, and every window —and the windows in a French street are rather numerous—is filled with as brilliant a display of beauty and fashion as one might expect to see on a similar occasion in Paris or London.

Every public preparation had been made at the railway station to give the Emperor a suitable reception, and the station was overlooked by galleries with privileged and unprivileged places, carpetted and ornamented and filled to overflowing,—while two new locomotives, gaily garlanded, stood at the landing place, and these were to be solemnly blessed immediately after the Emperor's arrival. The train was expected at half-past four, but it was five o'clock when a shrill whistle announced its approach. It was a very long one, the number of persons who had been invited by the railway directors to participate in the festivities being something enormous. When the train stopped, the Emperor and Empress saluted the company on both sides, and the cheering was quite as general and hearty as I have been accustomed to hear on similar occasions in England. The Emperor wore a general's uniform and the ribbon of the Legion of Honour, and the Empress a travelling tortelle, at once elegant and simple,—and for the information of all whom it may concern I may add, a crinoline of very reasonable dimensions. Both their Majesties looked exceedingly well, especially the Emperor, who seemed to be in excellent spirits, laughing and chatting and shaking hands with every one in his immediate vicinity. Their Majesties were attended by Count and Countess Walewski, Lord Cowley, Marshal Vaillant, Marshal Magnan, Generals Niel and Fleury, the Duchesse D'Ersling, &c. Their Majesties were received in the first instance by the clergy, who mustered in great force, forming quite a crowd on each side of the altar, and in a few minutes after the solemn prayer and benediction of the engines was commenced by the Bishop of Coutance, assisted by his clergy and a large body of choristers. During the service the Emperor and Empress stood on the right of the altar, the suite remaining at a short distance behind. The Empress knelt frequently during portions of the service, and the Emperor more than once crossed himself with great appearance of devotion. A solemn chant concluded this portion of the day's programme, and immediately after the imperial *cortége* proceeded to the presence chamber, where the Emperor and Empress received a perfect army of public departments.

While this ceremony was going forward, a tremendous salute from the whole French fleet shook the windows and intimated the occurrence of an event of first importance. It was no less than the arrival of the royal squadron of England with her Majesty the Queen, Prince Albert, and the suite, which has been given above. The moment the news was conveyed to the Emperor the dinner party was broken up, and at eight o'clock the imperial carriages were at the door, and his Majesty drove off amid renewed and deafening cheers, as it was understood to pay a private and friendly visit to the royal family of England. In the evening the town was most brilliantly illuminated,

and the crowd was as great as in the afternoon's procession. Every one seemed as happy as possible, and the people kept the peace themselves without the intervention of a single policeman.

The royal escort, consisting of the *Royal Albert*, three decker, *Renown*, *Diadem*, *Euryalus*, *Curaçoa*, and *Racoon*, had arrived off the harbour early in the morning, and formed a double line in the offing, between which the *Victoria and Albert*, and ten little satellites, the *Fairy*, *Banshee*, *Osborne*, *&c.*, sailed up in the morning, and at about seven o'clock a royal salute from the fleet announced that her Majesty's royal yacht had cast anchor in the *rade*. The dinner party on board, which took place immediately afterwards, comprised the Queen and Prince Consort, Duke of Cambridge, Earl and Countess Cowley, the young Princes (two), Earl of Malmesbury, Sir J. Pakington, Earl Delawarr, Sir C. Napier, Lady Desart, and Hon. Miss Bulteel. I have already made you aware by telegraph that subsequently the Emperor and Empress paid her Majesty a visit, and I have now only to add their Imperial Majesties remained on board the yacht for an hour and a half. Her Majesty's trip to the shore this morning must, I suppose, be taken as the return visit.

The good town of Cherbourg was startled from its propriety at noon of Thursday the 5th, by the most tremendous cannonade which it has ever been my lot to listen to. It was in fact a complete bombardment, until at last the whole atmosphere was filled with smoke, and the lively French people, who evidently like the report of gunpowder, danced and jumped about, and clapped their hands in quite a frenzy of pleasurable excitement. The vast rade looked like a flower garden, for the thousand yachts with which it is just now studded all ran up their gayest colours, and the most extraordinary reports got into circulation as to the cause of all this explosive commotion. The fact was that her most gracious Majesty the Queen of Great Britain was just at that moment leaving her royal yacht for a visit to the shore, the landing place being the entrance to the great arsenal. Lord and Lady Cowley had previously gone off to the yacht and had the honour of attending her Majesty to the shore, where the Emperor and Empress, with a magnificent *cortége* of imperial carriages and a military escort, were waiting to receive their illustrious guest. Her Majesty was accompanied by the Prince Consort, and the Commander-in-Chief, and attended by the Earl of Malmesbury, Sir J. Pakington, Earl Delawarr, Lady Desart, and Miss Bulteel. The streets were lined with troops, consisting chiefly of the Douane, and military bands, stationed at intervals, played appropriate music. Although few persons had previously known that the Queen intended to land to day, the streets filled as if by magic, and long before the *cortége* reached the Prefecture de la Marine, every space which was not kept clear by the troops was densely filled with people. The cheering was most enthusiastic, and the people were loud in their encomiums on the gracious deportment of our sovereign. The Queen partook of *déjeûner*, which lasted nearly an hour, when the carriages were again drawn up, and the whole of the illustrious

party proceeded on a promenade through the town, their ultimate destination being Fort Roule, a fortification situated on a high rock at the upper end of the commercial basin, and which commands amongst other things the modest residence of the British Consul. The cheering was incessant as the cavalcade proceeded along, and the crowd seemed puzzled which to demonstrate the most emphatically, their loyalty to their own sovereign or their sentiments of esteem for his illustrious guest. The business of the day would finish with the dinner on board the *Bretagne*, and it is generally understood that the Queen will start on her return to England early in the moring. To-night the fleet will be illuminated, and no doubt the whole of the 50,000 strangers, which the *Journal de Cherbourg* informs us have arrived, will be out to witness what, with fine weather, will be a most magnificent spectacle.

The royal yacht got on her way at exactly twelve this day of Friday the 6th, and with her illustrious passengers sailed slowly out of the *Rade* of Cherbourg. Some time previously a farewell visit was paid by the Emperor and Empress, and subsequently from the deck of the *Bretagne* their Majesties waved a succession of adieux. The saluting was, if possible, more than tremendous ever, salvo after salvo pealing forth from the great guns, filling the whole atmosphere with dense smoke, and stilling the waters with their terrific concussion. But indeed ever since the arrival of her Majesty the town has been suffering from a sort of chronic bombardment, the guns never being silent for many moments together, but when once set going, incapable of leaving off.

To-day Saturday was to have been the day of days in the week's programme, including the benediction and inauguration of the basin, the grand inspection of the *ateliers*, the promenade and the ball in the evening at the Hotel de Ville, but somehow or other the interest in everything has considerably subsided since the departure of the Queen of England, and this, with the intense heat, seems to cast a languor over the place. Their Imperial Majesties left the Marine Prefecture betimes in the morning, and drove round the town amid a considerable amount of cheering, seeming to be the objects of much curiosity, at least to the country visitors, and at twelve o'clock the horses' heads were turned to the Arsenal, where the *cortége* arrived a little before one.

Even at a quarter of a mile from the basin, the work of decoration had commenced; brass guns, brightly polished, were tastefully arranged on pyramids of shells, and colours were draped in trophies as only the French know how to drape them. We were stopped by gendarmes at every ten steps, and turned in some new direction, to come again in courteous collision with the authorities, who seemed to have a very confused idea indeed of printed instructions and official signatures. The avenue was lined by the sailors on each side, if it could be called a line. At the upper end of the basin, right and left, there were galleries erected, in which ladies solely were admitted, care being taken here, as well as everywhere else, to preclude the rougher sex from too near contact with the Emperor. In the centre was the im-

perial pavilion, a very small erection tastefully covered in crimson velvet, and in the front was one of those triumphal arches, which the French know how to make out of a few rough boards and a bit of painted canvas better than any other nation in the world. It looked as solid as if it had been porphyry or Scotch granite, and was decorated something after the manner of the gunmakers' arch at Birmingham, on the occasion of her Majesty's visit, only that the arms, either small or large, were not stuck all over it in quite such abundance and profusion. I never saw a greater variety of uniforms than were clustered round the base of this arch, blue and green, scarlet and grey,—every colour in fact that can be had in cloth, and all of the newest and gayest, in order that full respect might be paid to the Emperor's visit. The ladies were very numerous, and in very elegant morning toilettes, and the young naval officers had a congenial occupation in placing them in their convenient covered gallery, where I almost envied them the protection they enjoyed from the rays of a nearly vertical sun. The ceremonial being mainly religious, there was of course a large contingent of priests, headed by the Bishop of Coutance, a mild, venerable-looking man, who had already recommended himself to the Emperor by the fervour with which he recognised his Majesty's services in the cause of religion and good government, in his address at the Gaze on Wednesday last. The Bishop was in full pontificals, with mitre and crozier, and wearing the gold episcopal cross on his breast, and was attended by long trains of priests and deacons to assist him in the religious service. On the far or eastern side of the basin the beautiful two-decker *Ville de Nantes* (all the French men-of-war are better models than ours) lowered over the basin like an immense eagle ready for its swoop; but her "native element" was as yet to be supplied, and so she could not "glide majestically" into it, after the manner so frequently and with such infinite variety of phraseology described in the newspapers. But *pro tem.* she had been turned to a good purpose. Her quarter-deck was covered with the friends of the Minister of Marine, and her stern gallery crowded with ladies, who must have had the best possible view of everything that took place.

A great sight was evidently expected, or else the interest the French people felt in the completion of the basin. There were gentlemen and workmen, sailors and soldiers, women and children, priests and laymen, all mixed up in a free and easy sort of way, and the soldiers who were placed to keep them from tumbling into the immense chasm, into which they were all excessively fond of peering, were as free and easy as the rest and did their duty without the slightest gruffings or ill-humour. Being mostly young fellows, they seemed to occupy their time mainly in explaining to the pretty Norman girls the nature of the great dock and the purposes for which it was intended.

The gate at which his Majesty entered was devoted exclusively to that purpose, and the end of the dock being cut by three slips, no one passed up the centre slip but the imperial *cortége*. A staircase, covered with crimson cloth, led from the pavilion into the dock, and at

its foot was the inaugural stone with its coins and inscription plate, the fixing of which was to be one of the ceremonies.

When the choristers had chanted, and the Emperor had manipulated, every new proceeding being announced by fresh thunders from the great guns—by the way, I should like to know how much money it has cost to keep 1,200 guns firing all the week—each party retired, and we all waited with commendable patience for the grand rush of the waters which the engineers had promised us on the letting off of a given signal. Their plan was much admired here; but, for my part, I considered it to be very much like Dr. Reid's celebrated ventilation system for the House of Commons, which was superseded at last by simply opening the windows. These gentlemen *du genie* had placed a caisson with sluices at the entrance of the dock, and within it, that is, near the basin, a mound of sand as high as the caisson, and having a large interval between the two. The sand was mined, and the intention was that when the sluices were opened and the interval filled so as that the water began to flow down over the sand into the basin, the mines were to be exploded, and a grand torrent of caissons, sand, and water, was to tumble pell-mell into the dock, to the great astonishment and delight of the spectators. We waited patiently for upwards of an hour; but at last the Emperor and his suite were seen to depart, and this was the signal for a general rush to the gates, while the operation of immersion was really commenced by opening the lower dock gate and allowing the water to flow in in the ordinary fashion. Coming away, we had another convincing although not very pleasant proof of the immensity of the basin, for the gendarmes stationed at the various gates made us walk twice round it before they permitted us to leave. They had been ordered to keep some gate clear for the Emperor; and as they were not very sure which, they hermetically sealed the whole until his Majesty had commenced his inspection of the workshops. The launch of the *Ville de Nantes* followed the filling of the dock, into which she was launched in the presence of the Emperor in the evening.

The *Constitutionnel*, after dwelling on the warmth of the reception given to their Imperial Majesties by the population of Brittany, speaks in the following terms of the excellent effect which will be produced in France by the visit of Queen Victoria:—

"The report had been spread that her Majesty would not land at Cherbourg; but, on the contrary, she visited, with the Emperor Napoleon, the port which had sent forth more than one vessel to the Baltic and the Crimea, that fought by the side of the British fleet, and is now fighting by its side in Chinese waters. By this act of courtesy, good taste, and of sound policy, Queen Victoria proved herself superior, as also did her Government, to the sentiments which a fraction of the English press endeavoured to spread amongst the public. In France, gratitude will be felt towards her gracious Majesty for this manifestation of sincere friendship."

The *Débats*, whose opinions are valuable because thoroughly independent, and seldom expressed without due consideration, says:—

"For the second time within three years the Queen of England has set foot on French soil. We should be inconsistent with ourselves, with our known traditions, with the opinions which we have professed for the last thirty years, if we were not to say that this is an event of happy augury, which promises to maintain and strengthen the alliance between the two countries. This second visit of the Queen to the Emperor Napoleon derives, both from the theatre of the interview and the circumstances which preceded it, an importance and a particular significance which did not belong to the visit of 1855. Regretable incidents, to which we need not further allude, had thrown some clouds over the friendly relations between the two peoples. Susceptibilities traceable to souvenirs of a bygone period, prejudices and suspicions connected with the history of Cherbourg itself, had found a voice in a portion of the English press. Moreover, the absence of any allusion to the Cherbourg fetes in the Queen's speech had been remarked upon. Now that the visit has taken place we think it impossible that any vestige of the unpleasant feeling can remain. The facts speak for themselves, to adopt the happy expression used by the Emperor Napoleon, in proposing the Queen's health, and Prince Albert's answer to the toast proves that the sentiment is reciprocal. The interview at Cherbourg, in the words of the Prince, 'by strengthening the ties which unite the two nations, assures their reciprocal prosperity.' This is the essential point, this it is which, in our opinion, renders the rejoicings at Cherbourg, and the two speeches pronounced on board the *Bretagne*, really interesting."

The *Patrie* says;—

"The Queen of England, with her noble heart, has understood the Emperor's policy. She has baffled all previous calculations and more than realised every noble hope. Certainly there was no lack of malevolent prophets in Europe. First of all, they pretended that the Queen was not coming; then, when the news of the visit was official, they said she would not land. Where are now their predictions? The Queen did come; she did land, and in every detail of her visit she displayed infinite grace. She had the good taste to bring with her Lord Lyons, the one of all the English Admirals who is most liked by the French navy, and a man who is at the head of a numerous party. [This is a fact of which I was not aware.] To all the Queen's politeness the Emperor responded by the most cordial hospitality. We know moreover that in this memorable conjuncture the Emperor desired only to be guarded by his own good right. Our allies landed without passports and responded to the utmost liberty by the utmost sympathy. Is not an alliance thus consolidated serious and sincere? This interview has an immense signification, both as regards the greatness of the two countries and the civilization and liberty of peoples. There has been no treaty signed, it is true; there has been only the

visit of a Queen and the hospitality of an Emperor. But a great event has been accomplished, and we have the peace of Cherbourg."

The Emperor, in proposing the toast of the health of her Majesty and of the Royal Family of England, made a speech, in which he said,—"I am happy to be enabled to express the sentiments by which I am animated upon this occasion of the Queen's visit to Cherbourg. The facts do indeed speak for themselves, and prove that the hostile passions which were excited by some unfortunate incidents have never been able to alter either the friendship which exists between the two Crowns, or the desire of the peoples to remain at peace. I have, therefore, the firm hope that if any attempts were made to revive again the rancours of a former period, such attempts would be foiled by the good sense of the public, as the waves are baffled by yonder break-water, which at this moment serves to protect the squadrons of both empires against the violence of the sea."

The Prince Consort, on behalf of her Majesty, responded to the toast, in doing which he said,—"The Queen is most sensible of the words we have just heard, which will for ever be dear to her. The Queen is doubly happy in having an opportunity, by her presence here, to join the Emperor in endeavouring to draw together as closely as possible the ties of friendship which exist between the two nations. That friendship has their mutual prosperity for its basis, and the blessing of Heaven will not be wanting to confirm it."

WRECKING ACT—*Bahamas—of 1st July*, 1858.

(Concluded from page 442.)

Twenty-fourth.—Any person having signed agreement to serve in a wrecking vessel and shall absent himself either before or during the voyage, shall be subject to penalties provided.

Twenty-fifth.—Any person taking derelict or salved property from a wrecking vessel shall be fined not less that £50 nor more than £500;—or any master refusing to convey such property to Nassau, shall be fined not less than £10 nor more than £50.

Twenty-sixth.—That H.M. naval officers arriving accidentally at the scene of wreck may assume the duties of wreck master at the solicitation of her master provided he does not participate in salvage.

Twenty-seventh.—That whenever it shall appear that any vessel has been wrecked or stranded by collusion between her master and any licensed wreckers, inquiry shall be made before any two justices of the peace, and if no ground for such suspicion shall appear, a certificate to that effect shall be delivered to the party suspected.

Twenty-eighth.—That the said justices shall examine any person who may be able to give account concerning wreck on the following:—

1. Name and description of ship.
2. Names of master and owners.
3. Name of owner of cargo.

4. Port or place from and bound to.
5. Occasion of distress of ship.
6. Services rendered.
7. All other matters as may be considered necessary. These examinations shall be in writing, one copy being sent to the Governor and another as a record to the office of Secretary of the colony.

Twenty ninth.—That in cases where it is suspected that there is evasion of this Act or the existing laws relating to merchant seamen, every such justice shall have the following powers:—

1. He may personally visit any ship or vessel licensed under this Act and inspect any part of her or her equipment, &c., but may not detain her unnecessarily from her voyage.
2. He may enter and inspect any premises which he may think necessary for the purposes of his report.
3. He may summon persons before him and require from them answers or returns to his inquiries.
4. He may enforce the production of all books, papers, or documents which he considers important.
5. He may administer oaths or require a declaration from persons examined by him as to the truth of their statements.
6. He may commit for contempt or other such reason any person as he otherwise would as justice. Witnesses summoned shall be allowed their expences. And persons refusing to appear to a summons, or refusing to give answer or any return, or to produce any document in his possession, or to subscribe to a declaration required of him, shall for each offence incur a penalty of not less than £10 nor more than £50.

Thirtieth.—Persons impeding such justice in the execution of his duty, shall be liable to a penalty of not less than £10 nor more than £50.

Thirty-first.—If there shall appear reasonable ground for considering that any criminal offence has been committed by any person or persons, it shall be lawful for such person to be dealt with by the justice in the same manner as if such person had been brought before him for such offence, proceedings to follow in a similar manner.

Thirty second.—Expences of official investigations to be defrayed by the public treasury provided Home Government defray the other half; and provided that the former do not in one year exceed £150.

Thirty-third.—That any person who shall wilfully destroy any vessel by wreck or fire, or by a false light, or otherwise, or be concerned in so doing, or prevent any person from saving life from any wrecked vessel, shall be guilty of felony, and be imprisoned for any period not less than one year nor more than five.

Thirty-fourth.—Plundering or stealing from a wreck to be felony, and punished by imprisonment with hard labour for not less than six months nor more than five years; where the property stolen or thus embezzled does not exceed in value £5, the party guilty shall be imprisoned with hard labour for any term not exceeding six months.

Thirty-fifth.—Persons employed in saving from wreck embezzling property valued under £10, to be imprisoned without hard labour for not more than three months: if beyond the value of £10, imprisonment not to exceed two years, and be liable to forfeit licence for not more than twelve months, as well as all claim to salvage, provided such property so embezzled amounts to larceny.

Thirty-sixth.—That if the master of wrecked vessel makes oath that he has reason to believe that any part of cargo or materials of wrecked property has been embezzled and more vessels than one have been employed in saving

property, justice of peace to grant one or more search warrants for its discovery.

Thirty-seventh.—That if such goods so embezzled be found on the premises of any person or persons with knowledge and consent of those persons, the goods shall be delivered to the rightful owner and the offender shall forfeit a sum not exceeding £5, and the owner of the premises should he be entitled to salvage to forfeit all claim thereto.

Thirty-eighth.—Selling goods thus unlawfully obtained from a wrecked vessel or one in distress, to render the person so doing liable to a fine of not more than £20, and the goods to be returned to their rightful owner.

Thirty-ninth.—That every felony punishable under this Act, every principal in second degree, and every accessory before the fact, shall be punishable in the same manner as the principal in the first degree: and every accessory to be imprisoned for any term not exceeding two years.

Fortieth.—That all fines under this Act under £10 shall be recovered before a justice of the peace, and when exceeding £10 shall be recovered in the General Court, payment being enforced by levy and sale of goods, or committal to prison: imprisonment before former not to exceed six months, nor in cases of General Court to exceed two years.

Forty-first.—Offences not defined in this Act to be tried in the General Court, which is empowered to suspend licences.

Forty-second.—Superintendance of matters connected with the Act to rest with the Governor and masters of wrecking vessels or boats to be furnished with a copy of the Act.

Forty-third.—That any person convicted under this Act shall forfeit all share of salvage remuneration.

Forty-fourth.—Regards costs in actions.

Forty-fifth.—Gives right of appeal from justice of peace to General Court at Nassau.

Forty-sixth.—Regulates sales of marine stores, thus:—

1. A person selling marine stores shall keep a book in which all such stores shall be entered (excepting such as are purchased at public auction) stating when and person from whom he purchased them and his place of abode: under a penalty for first offence not exceeding £2, and for others afterwards not exceeding £5.

2. He shall not purchase such stores from any one under sixteen years of age, under penalty of £3 for first offence, and not more than £5 for all after.

3. That such book shall be open at all times to the inspection of police, and refusing to show them on demand he shall incur a penalty not exceeding £5.

4. He shall register his name at the police office, and omitting to do so shall incur a penalty not exceeding £5.

Forty-seventh.—The Act to be called the "Licensed Vessels Act 1858."

Forty-eighth.—Annuls former Acts.

Forty-ninth.—This Act shall commence and take effect on the 1st of July, 1858, and continue in force for five years.

Schedules A and B give form of licences.

TABLE LXXVI.

For reducing Spanish Leagues to English, and English Leagues to Spanish.

1 Spanish Legal League = 0·8663250 English League.
1 English League ..... = 1·1542985 Spanish Legal League.

Spanish or English Leags	English Leagues & Dec. Parts.	Spanish Leagues & Dec. Parts	Spanish or English Leags	English Leagues & Dec. Parts	Spanish Leagues & Dec. Parts.	Spansh or English Leages	English Leagues and Decimal Parts	Spanish Leagues and Decimal Parts
1	0·866	1·154	40	34·653	46·172	78	67·573	90·035
2	1·733	2·309	41	35·519	47·326	79	68·439	91·190
3	2·599	3·463	42	36·386	48·481	80	69·306	92·344
4	3·465	4·617	43	37·252	49·635	81	70·172	93·498
5	4·332	5·771	44	38·118	50·789	82	71·039	94·652
6	5·198	6·926	45	38·985	51·943	83	71·905	95·807
7	6·064	8·080	46	39·851	53·098	84	72·771	96·961
8	6·931	9·234	47	40·717	54·252	85	73·638	98·115
9	7·797	10·389	48	41·584	55·406	86	74·504	99·270
10	8·663	11·543	49	42·450	56·561	87	75·370	100·424
11	9·530	12·697	50	43·316	57·715	88	76·237	101·578
12	10·396	13·851	51	44·183	58·869	89	77·103	102·733
13	11·262	15·096	52	45·049	60·024	90	77·969	103·887
14	12·129	16·160	53	45·915	61·178	91	78·837	105·041
15	12·995	17·314	54	46·782	62·332	92	79·702	106·195
16	13·861	18·469	55	47·648	63·486	93	80·568	107·350
17	14·728	19·623	56	48·514	64·641	94	81·435	108·504
18	15·594	20·777	57	49·381	65·795	95	82·301	109·658
19	16·460	21·932	58	50·247	66·949	96	83·167	110·813
20	17·327	23·086	59	51·113	68·104	97	84·034	111·967
21	18·193	24·240	60	51·980	69·258	98	84·900	113·121
22	19·059	25·395	61	52·846	70·412	99	85·766	114·276
23	19·925	26·549	62	53·712	71·567	100	86·633	115·430
24	20·792	27·703	63	54·578	72·721	150	129·949	173 145
25	21·658	28·857	64	55·445	73·875	200	173·265	230·860
26	22·524	30·012	65	56·311	75·029	250	216·581	288·575
27	23·391	31·166	66	57·177	76·184	300	259·898	346·290
28	24·257	32·320	67	58·044	77·338	350	303·214	403·904
29	24·123	33·475	68	58·910	78·492	400	346·530	461·719
30	25·990	34·629	69	59·776	79·647	450	389·846	519·434
31	26·856	35·783	70	60·643	80·801	500	433·163	577·149
32	27·722	36·938	71	61·509	81·955	550	476·479	624·864
33	28·589	38·092	72	62·375	83·109	600	519·796	693·579
34	29·455	39·246	73	63·242	84·264	650	563·111	750·294
35	30·321	40·400	74	64·108	85·418	700	606·428	808·009
36	31·188	41·555	75	64·974	86·572	800	693·060	923·439
37	32·054	42·709	76	65·841	87·727	900	779·693	1038·869
38	32·920	43·863	77	66·707	88·881	1000	866·326	1154·299
39	33·787	45·018						

The Atlantic Cable.

Well,—we have been half electrified already by the glorious achievement of the *Agamemnon* and *Niagara*, although we had anticipated the other half. The great event, at least our part of its accomplishment, may be scanned in our own pages in the words of the engineer. In spite of all difficulties, and they were neither few nor small, the work has been done, and all the hopes of the most sanguine of its supporters are being realized. A short week was all that was required, as we have already said, but it was hardly fair to overload a ship to her upper decks and then expect her to brave the roughest weather. Great credit is due to her Captain, Preedy for his able management of the *Agamemnon;* but credit is due to all concerned, and we must take another opportunity of alluding to that, as we would preserve here the following capital observations from the same paper which published the engineer's journal.

The 5th of August will henceforth be celebrated as the day on which the Old and New World were brought into instantaneous communication, by the triumph of mind over matter. In an age of marvels the most marvellous work of all has been effected. The wildest imagination of the wildest poet never ventured to play with such a wonder as this. The despised men of science, the patient questioners of nature, have found the means of freeing the subtle lightning confined in a few drops of water or a few grains of metal. They have laid a pathway for it to travel through the lowest stillest depths of the Atlantic, far below the influence of wave and storm. The imprisoned spirit, freed from matter by thought, conveys its commands with the rapidity of its liberator.

The same subtle spirit which directed Columbus to the shores of the New World now becomes man's messenger to carry his thoughts from one world to the other. The same power which made the needle point to the pole to lead the mariner over the pathless ocean, now conveys man's messages below its abyss with a rapidity that mocks even the flight of time.

It was nearly two centuries after Marco Polo brought the pole of the magnetic needle for navigation from China, before the adventurous Columbus, trusting to its guidance, discovered the Indies of the West. Science now marches with more rapid strides. The same generation which witnessed the first steamboat tempt the waters in defiance of wind and tide, saw steam unite the Old and New World in hebdomadal communication.

It is hardly seventy years since Madame Galvani observed the convulsions of the frogs she was preparing for her husband's soup, when touched by an electrical conductor. Her accidental observations gave birth to those splendid series of discoveries which, in less than a century, have unfolded such strange pages in the Book of Nature, and which the utilising spirit of the age has already so successfully appropriated to the exigencies of the highest degree of civilisation.

Lord Bacon taught us that the best mode of acquiring a knowledge of the secrets of Nature was to ask her questions, with a humble, diligent, teachable spirit. Threescore years and ten have been devoted to the inquiries—Why does amber when rubbed draw light feathers to itself? Why does the magnet attract iron and point to the poles? Why should a dead frog be apparently brought again to life for an instant if when one metal touches a nerve and another a muscle these two metals be united to a third? The answers to these three questions have reduced all three phenomena to the action of one single cause. All lead to the subtle spirit or power we call Electricity. Though as yet we know not what this electricity is, we have learnt to tame it. It is the sprit of the storm. We see it in the lightning; we hear it in the thunder. We make it our Vulcan to eliminate metals from the earth which swim on

water. We cause it to rend rocks asunder. It is the slave of the metallurgist. We make it reduce the works of an age into instantaneous ruin. It has crumbled Russia's proudest engineering triumph into dust, with the resistless power of the thunderbolt; and now it is our Mercury to carry winged messages from the Old World to the New with lightning speed.

The triumph of the Atlantic Cable is all the greater as previous failures have shown that the work was one of no slight difficulty. When we announced the last failure we did so still sanguine of the ultimate success of the great undertaking. Three hundred and thirty miles of cable had been laid in the lowest depths of the Atlantic. Failure, therefore, presaged success. If three hundred miles could be laid, why should not three thousand, if necessary? Perseverance has been rewarded with its natural results.

The rendezvous was reached by the two vessels on Wednesday, the 28th of July. The next morning the *Niagara's* portion of the cable was spliced to the *Agamemnon's*, on board the latter. By noon the next day, Friday, 265 nautical miles were laid between the two ships. On Saturday the distance between the *Agamemnon* and *Niagara* was increased to 540 miles. On Sunday it was 884, on Tuesday 1,256, and on Wednesday 1,854 miles. At six o'clock in the morning of Thursday, the 5th of August, the *Agamemnon* was anchored in Valentia Harbour. The *Niagara* had safely reached Trinity Bay, Newfoundland. The two ships were united by 2,022 miles of cable, and the Atlantic Telegraph was conveying to both crews the gratifying intelligence that their anxieties were over, and the work done well, without an accident to mar it.

As if to increase the triumph of success, the brief Telegram from Valentia notes that, with the exception of the last day of the operations, the weather has been unfavourable. Thus in one week steam power, guided by human skill, has united Great Britain and America in the electrical communication of one second. The extremely ingenious Telegraph of Professor Hughes, will now enable the Telegraph Clerk in London to print a letter of the alphabet in London, and the same letter, at an interval of one second, on a strip of paper, in good Roman print and good printer's ink, at New York. He may then print letter after letter at intervals of half a second. This is now the possible speed of transmission.

The laying down the cable is not the only triumph. The question is now settled that electrical waves can be sent and made intelligible through more than 2,000 miles of wire submerged in the lowest depths of the ocean. Wise men shook their heads, and certain foreboders of failure calculated the pressure of the ocean on a cable two miles under water. There were ugly phenomena, entitled retardations of submarine currents. Could the electric wave move freely through a wire little thicker, if any, than a lady's bodkin, without being stopped by such gigantic pressure? This was an anxious question. It is now answered by the successful communications between the *Agamemnon* in Valentia Harbour and the *Niagara* in Trinity Bay, Newfoundland.

It is not often we sympathise with any transaction bearing the semblance of gambling, but we must confess that we could not help wishing that the adventurous individual who is said the other day to have bought an Atlantic Telegraph share at £300, had bought a score of them. The success of the Atlantic Telegraph follows immediately after the announcement of the Red Sea Telegraph becoming a possibility. Surely England, with her great Indian empire and its thousand exigencies, will never rest till she has carried her Indian Telegraph from the Land's End to Gibraltar, from Gibraltar to Malta, from Malta to Alexandria, thence by the Red Sea to Bombay. The next step will be to connect Ceylon or Madras with Singapore and the Australian Colonies by an electric wire. England will thus as nearly as possible render herself independent of all foreign interference.

Deep Sea Telegraphy is yet in its infancy, and the Atlantic success is but the birth of a great power, which must speedily bring Great Britain into immediate communication with all her dependencies.

The first exchange of messages by the Atlantic Cable must ever remain one of the proudest achievements of science and art in this country, and with reference to the preceding articles on the cable we now add the two following between her Majesty Queen Victoria and the President of the United States.

The Queen to the President.

The Queen desires to congratulate the President upon the successful completion of this great international work in which the Queen has taken the deepest interest.

The Queen is convinced that the President will join with her in fervently hoping that the Electric Cable, which now connects Great Britain with the United States, will prove an additional link between the two nations, whose friendship is founded upon their common interests and reciprocal esteem.

The Queen has much pleasure in thus directly communicating with the President, and in renewing to him her best wishes for the prosperity of the United States.

The President to the Queen.

To Her Majesty Queen Victoria, Queen of Great Britain.

Washington City.

The President cordially reciprocates the congratulations of her Majesty the Queen on the success of the great international enterprise accomplished by the skill, science, and indomitable energy of the two countries.

It is a triumph more glorious because far more useful to mankind than was ever won by conqueror on the field of battle. May the Atlantic Telegraph under the blessing of heaven prove to be a bond of perpetual peace and friendship between the kindred nations, and an instrument destined by Divine Providence to diffuse religion, civilisation, liberty, and law throughout the world.

In this view will not all the nations of Christendom spontaneously unite in the declaration that it shall be for ever neutral, and that its communications shall be held sacred in passing to the places of their destination even in the midst of hostilities?

James Buchanan.

The New Colony in America.—The name has been changed from New Caledonia to British Columbia—by which it seems to prefix something to an old name was actually necessary even in these times. The reasons why the former name was better let alone we stated in our last, as well as that objections might be taken to one we proposed. Its successor reminds us not only of Columbus, who never was near that part of the world, but also of the noble river Columbia, which *once* formed the boundary line between us and the United States territory, but which we have given away to our busy descendants. To our mind the shorter names are the better when they are applied to geography or hydrography, for on paper an assemblage of two or three to signify a place is evidently superfluous, and covers space to the exclusion of other information. In fact, a repetition of names is inimical to conciseness and precision. In the case before us the single name of "Georgia," instead of New Caledonia, or British Columbia, although perhaps

not free from objections on the part of the critics, would have been full of meaning. It would at least have perpetuated the memory of the great ancestor of our Queen; the discoveries of its coasts in his time by our great circumnavigator, Cook; and would have been plain good English, acceptable not only to our countrymen who are settled in that colony, but intelligible to the native tribes, who have long been accustomed to have dealings with King George's men.

THE CHRONOMETER SAFE.—We noticed in a recent number an invention of Mr. Johnson for preserving chronometers from the effects of foul and damp air and the dirt which is flying about in ships, and of which we entertain the high opinion which we there expressed. But we have misled our readers respecting the address of the inventor, which is not in the Strand, but at No. 9, Wilmington Square, in the North of London.

Sayings and Doings.

JOINTED SHIPS.—An important innovation in steam shipping is now being carried out by the Jointed Ship Company, who are running the *Connector*, a jointed steamer, in the London coal trade. This vessel is built in three distinct sections or compartments, on the plan patented by Mr. M'Sweney. The sections are coupled together by a joint of extreme simplicity and enormous strength, which admits of instantaneous disconnection of any one section from the others when required. One section contains the engine and the crew, and the other two are exclusively cargo sections. On this system the joints are all made to one guage, so that the engine section can be applied to any number of other sections or vessels. The commercial advantages obtained by this novel system of steam shipping are stated by the projectors to be the facility afforded by avoiding the detention of the present costly marine engine and staff during loading and unloading of cargo and repairs of tonnage, as the jointed engine section can always be transferred from one vessel to another joint, as the locomotive is from one train to another. The feature of this plan is that on long steam routes by river, lake, or coast, cargo sections can be picked up, jointed on, and taken forward, or disconnected and left behind, with about as little delay as a railway train can be increased or diminished. A further advantage claimed is that jointed vessels (up to 2,000 tons) can be constructed of so light a draught—say five feet—that their sections may be loaded at inland ports and proceed, by shallow river, lake, or canal, to a seaport, there be jointed to this engine section, and take their cargoes direct over sea, avoiding the expense and delay of transhipment.

The *Connector* has just made a successful voyage to Hartlepool, and is now discharging a cargo of coals from that place in the Regent Canal Dock.

NAVIGATION OF THE INDUS.—We laid before our readers, some time since, a short description of two steam-trains which have been built by Messrs. Vernon and Son, of this town, for the navigation of the River Indus, in India. These steam-trains, we stated, are each of greater length than the *Leviathan*. They are the property of the Oriental Inland Steam Company, of London, who, with the aid of a subsidy from the Hon. East India Company, have undertaken to establish vessels of this kind widely upon the rivers of India.

We are now happy to announce that these vessels, which, we believe, are destined to exert an important influence on the fortunes of the East, have been despatched to their destination. Having been taken to pieces, the barges constituting the train, together with the engines and all other apparatus, have been shipped on board of the splendid new ship *Chilwickbury*, belonging to Messrs. Toulmin, of London, and this vessel has now sailed for Kurrachee with her interesting cargo. A large number of workmen have been sent in the ship to assist in the re-erection of the barges in India. Before the vessel sailed a dinner was given to these workmen by the directors. The men are first-class men, all carefully selected, and they seem to be animated with abundant zeal for carrying out the important work entrusted to their hands.

Liverpool Albion.

At the Liverpool police-court on Monday, the owners of the ship *Shooting Star*, lately returned from Melbourne, were charged by a number of the passengers with having supplied them with bad bread, and an insufficient quantity of provisions. Several other breaches of the Passenger Act were alleged against the owners, but they were all dismissed except the one relating to the bread, and the owners, on admitting the justice of the complaints made by the witnesses, were fine £40 and costs.

The French Maritime authorities appear to be disposed to adopt the system of examination pursued with such good results by our Local Marine Boards. The *Journal du Havre* contains a list of successful candidates at a recent examination held at Cherbourg on the 13th of August on the practice and theory of Navigation. The examination appears to have been held under the direction of the Minister of Marine, and the candidates selected are authorised to take command of merchant vessels on either certificates of service or of seamanship.

It will be recollected that the fine clipper ship *James Baines*, one of Messrs. Baines and Co.'s "Black Ball" fleet, was burnt to the water's edge while lying in the Huskisson Dock, shortly after her return from India, whither she had sailed with troops and stores. The wreck was submitted by auction for public competition. For the hull a first bid of £500 was made, and after some spirited bidding it was knocked down to Mr. Pace for £1,080. It is understood that she is to be rebuilt.

The *Presse* announces that the crew of a French ship, called the *Marie Caroline*, of Nantes, have been murdered, and the ship burned, in the river of Sona-Rano, in the island of Madagascar. It appears that the ship came to the island to engage free labourers for the French colonies, which one of the Madagascar chiefs promised to supply. He then induced the captain to come on shore to receive the labourers, when he treacherously murdered him and obtained possession of the ship, which he burned.

The directors of the South-Eastern Railway have determined on improving the harbour of Folkestone, and of rendering it available for steam-packets at all times of the tide. The plan at present proposed is to erect a jetty of between 300 and 400 feet in length, extending in a S.E. direction, while a corresponding jetty is to be constructed on the site of the existing one on the East, and extended so as to form a safe and commodious harbour for both steamers and sailing vessels.—*Dover Chronicle.*

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

OCTOBER, 1858.

The Barrage of the Nile.

This gigantic work is no less interesting than the marvellous antiquities to be seen further on. It is placed at the very angle of the Delta on the Rosetta and Damietta branches of the river, and the fort is between the two branches. That on the left, or the Rosetta, has sixty-two arches in a total length of 536 yards.

That on the right, or the Damietta, has sixty-five arches, and is 563 yards long. The heads of the works abut against each other. The fort, which is not yet finished, at present employs more than 20,000 workmen, Fellatahs, who pay their tax or impost by their labour, and they are relieved every two months by an another equal number. Two hours were occupied by the visitors in going over a part of the fortifications, which extend over three miles, and in returning to where they landed they followed the bank of the central canal. It will take two years to complete the fortress, which will easily lodge a garrison of two thousand men. It is already partly completed with guns, which, with mortars and all their apparatus, are in their places. Proceeding to Masateric, the ancient Heliopolis, the party visited the place where, according to tradition, the Virgin took refuge on the flight to Egypt, and also the fountain which bears her name.

The Needle stands in the midst of a garden, but is not so handsome as that of Cleopatra at Alexandria. The Virgin's arbour is formed by a magnificent sycamore, some of the leaves of which were gathered

by the party as interesting souvenirs from the tradition attached to them.

Early the next morning a steamboat conducted the party as soon as possible to the pyramids, and at the landing place mules and an escort awaited the visitors and conveyed them after an hour's ride to the foot of the highest pyramid. Some of the officers climbed up it, assisted by the Arabs, while others visited the interior, and at noon the caravan returned to Cairo.

Others of the officers availed themselves in the afternoon of visiting a friend, M. Minie, whom they knew at Alexandria, and who with his family had resided in the house which Napoleon had occupied while on his entry of Cairo. M. Minie is the inventor of the rifle which bears his name. He has been four years in the service of the Viceroy of Egypt, and has already established a foundry and important factories, which work well. Said Pacha refuses him nothing, and the Viceroy intends forming an army and equipping it by the industrial resources of Egypt. The party passed a brief night of a couple of hours on board the steamer, and at four in the morning were on their way to Serapeum.

In passing up the Nile the ancient quarries of Toura were before them, from which nearly all the stone was obtained for the pyramids. M. Mariette was informed that an interesting discovery had been recently made. In removing some heaps of ground which had remained in that condition for ages, the workmen found about six hundred skeletons, each one having by his side the tools with which he worked and removed the stone. All these tools were made of copper. It would thus appear evident that these six hundred unfortunate wretches had been buried for 4,000 years, the victims of one of those remote catastrophes in the annals of time by which human industry has been foiled.

Having arrived at a certain distance up the river the caravan halted, and finding there the animals awaiting, the party continued without stopping. At Mitrahine, a town built in the midst of the ancient Memphis, the guide showed the admiral in a place where some important excavations had been made, the colossal statue of Ramesis, in admirable preservation, which the Viceroy had presented to the English, but which had been left in the place where it was found from want of sufficiently powerful means to remove it. There were also other statues, the inscriptions of which, explained by M. Mariette, assigned to them the most remote antiquity, even to almost fabulous ages. Two ornamented stones, of Jewish sculpture before the time of our Saviour, were seen among the rest

The discovery of Serapeum, at which they now arrived, was made by M. Mariette only four years ago. This gentleman left France for a stay of three or four months, and it is believed that he intended to publish a work of his researches, which could not be otherwise than most interesting. Perhaps he will mention in it the journey which he made with Admiral Clavaud. The admiral has seen these immense grottoes lighted by the *fellah*, the large table prepared in the sarco-

phagus of the bull Apis, and which, notwithstanding its large dimensions, has been entirely covered by a large cloth placed on a mummy. Twelve persons at this table drank to the Viceroy and to France.

Twenty-four sarcophagi in granite, nearly of similar dimensions, and wonderfully polished, are arranged in these enormous caverns. How have they been placed there? No one can tell. They are each formed of a single block of beautiful granite, and some of them weigh sixty to seventy tons and even more. The prying tourist has been here, and to take away a souvenir has made devastation. The corners of the sarcophagi have been chipped. After the visit to Serapeum the party returned to the nearest town, where three mummies and some antique vases had been conveyed. The mummies being opened were found in a state of decomposition, and the vases contained nothing more than eggs of the ibis, which latter were divided among the officers, who were thus well rewarded;—eggs 4,000 years old, and from Serapeum!—*La Flotte.*

Recollections of the Marquesas.

The voyager arriving from the coast of America on the eastern side of Nuku-Heba is struck by the arid and desolate appearance of the islands. He sees, in fact, before him nothing but masses of rugged rocks, the bases of which are washed by the sea and the summits bearing a herbage nearly burnt up by the sun. He may possibly discover some few *arbres de fer*, the lank branches of which are undergoing torture from the wind. Two majestic promontories form the limits of this part of the island, while the eye cannot even discover the smallest vestige of sand. To the North is the Cape Adam and Eve, and to the South is Cape Martin. The South coast, which is just distinguishable, presents the same arid condition. This is right perhaps for the land selected as the place of transportation, and that those convicted in the plot of Lyons, when first they beheld a place of such wild and savage nature, should consider themselves at the threshold of those regions where not even hope can find an entrance.

Happily, as the vessel proceeds westward, the scene changes. As soon as Cape Martin is passed a large bay is entered (Comptroller Bay), where magnificent valleys terminate, and among others that of Typee Vai, which extends to the centre of the island. A little further an inaccessible wall is seen, which must be followed for some miles, as far as the Bay of Tai-o-hai, defended at its entrance by two isolated rocks known by the name of the Two Sentinels. It is here that the French establishment is situated, and the presence of political exiles invested it with importance.

The bay and the five valleys which proceed from it would be well

represented by the outline of the left hand placed flat on paper. The whole of the wrist and the palm of the hand would represent the sea, and the contour of the five fingers would indicate the direction of the valleys enclosed between the heights of the mountains which surround the bay. The French establishment stands to the East,—composed of a fort, which commands the roadstead, a handsome building for the officers' quarters, a huge magazine for provisions, and an elegant dwelling house for the Commandant; which latter is surrounded by a well laid out garden, some kitchen-gardens, and many shady walks of hibiscus, which in this place wear a continual freshness, well appreciated in the ninth parallel of South latitude.

Behind the house, on a small conspicuous plain, exposed to observation, are the little dwellings of the banished. Each family party has its little cottage and ground sufficiently large for gardening. Two other buildings appear to form the lodging of the officer of gens d'armerie commanding the penitentiary and that of the soldiers of the guard. The whole presented an interesting appearance, clean, bright, and agreeable to the eye, but, alas, it was a prison! and those who occupied it had to pass a sorrowful time in the midst of forced idleness, where the days followed each other with a painful monotony. Poor reformers! they had attacked society in the name of universal brotherhood, and they were unable even to preserve concord among each other. They lived in enmity, instead of alleviating the burden of their sorrow by sharing it with each other. Strange contrast! For them, this place was banishment, and for me, absent from France already for some time, it was almost a corner of my country. The glorious colours of Sebastopol were seen waving there; twice in the day the gun of the corvette made the mountains echo with its sound, as in a French roadstead; and when I heard the evening drums they naturally recalled to mind the days of my infancy, when many a time I had followed their music.

At the foot of the fort is the landing place, from whence a path cut in the rock leads to the Place d'Armes; and then another road commences, remarkably well preserved, which continues round the bay parallel to the shore as far as the abode of King Temoana. By following this road the Catholic chapel is discovered on the bank of a rivulet at the entrance of the valley of Troheni. It presents all the simplicity of the primitive church. The chapel is a thatched building, scarcely larger than those occupied by the poor apostolic vicar and his assistants. But there is an air of earnestness in the midst of this poverty and the absence of all resources. Even the want of a belfry is supplied, a tree nearest to the sanctuary lending the charm of novelty which one does not feel in our splendid cathedrals. It is there that one may adore Him who for the sake of preaching humility consented to be born in a stable.

A little further on, on both sides of the road which leads to the blockhouse of the valley of Avao, are groups of little houses belonging to the officers of the garrison and the vessel stationed there. In fact, they are their country houses, where they cultivate gardens

themselves, or pass leisure hours in study, manual exercise, and occasional promenades, by way of passing that entire banishment patiently under which they live, and of which no one seems to know the termination. Continuing along the strand, the house of Temoana is seen, an important man in this country, the chief of some considerable tribes and the faithful subject of France. This brave man, who on great occasions wears a coat with epaulettes, preserves in his own house the customs of his ancestors—that is to say, he dresses himself as little as possible! He is the only native whose face is not tattoed. His wife Vaekehu is an excellent person. Before she became a Catholic she made no scruple of showing to strangers the magnificent tattoing on her body and the lower part of her back. Temoana visited England in his youth, and has only the remembrance of having done so. "It is a country," he said, "in which the people have nothing to eat, while in mine every one has plenty." Such is the only impression which his stay in Europe has left; nevertheless, he has a lively desire to go to France to see the thousands of soldiers manœuvre before the Emperor, of whom he spoke in great admiration and in terms of the most profound respect.

Behind this royal residence are some graves, which must not be forgotten. The mode of burial adopted by the people of the Marquesas is unique, having no parallel anywhere. When a person is at the point of death, his relatives bring his canoe to his side, as it is intended to serve as his coffin. The sick person endeavours to ascertain whether it suits him, and such, among these people, is the contempt of death that this business causes no emotion among them. As soon as the person is dead he is bewailed with loud cries, accompanied by drums, and is then laid in the canoe, which is placed in a corner of the house. Among the survivors, the person who is nearest related to him (generally his wife or one of his daughters) undertakes the task of rubbing him for several hours every day with an oleaginous composition, which ends in completely drying up the body, until it becomes like a skin of parchment over a skeleton. This operation is performed in the presence of every one, each person following his daily occupation. No one pays any attention to her. The person employed in the above extraordinary operation has never been known to take the pains to wash her hands before plunging them into a plate of papoi common to all, a composition of boiled fruit and bread. When the corpse has been reduced to what is considered a satisfactory state, it is enveloped in bands like a mummy, and sometimes suspended in the family house or in a neighbouring hut, but it is more frequently placed in the open air upon two trunks of cocoanut trees fixed in the ground. Care is taken to place by the side of it various utensils of the table, in which the piety of the parents leads them from time to time to place food for the defunct. Here I must say there is in these offerings a remarkable parallel to placing wreaths and chaplets of flowers followed by ourselves. The dead are soon forgotten for the living, but if I am not mistaken the dead inspire

more or less fear. A native never sleeps alone in a house where he knows there is a dead body. After sunset he never passes a grave. If one passes a night among the natives, at the least noise of the wind outside he is sure to hear mentioned the name of the terrible Inpapako.

Among the customs of these people, when a child is born they place in his mouth a mixture of popoi and minced shrimps, in order that he may be strong and may swim well. Another custom of the natives is worth mentioning, having reference to kava. The disgusting manner in which this drink is prepared is too well known to require description. It is well known that the kava is the root of a kind of pepper, of which I would give the scientific name but for appearing pedantic. In the mastication and diluting the result of it with water a beverage is obtained which occasions in those who partake of it a kind of stupor resembling the effects of opium. The natives who drink freely of it are attacked in their old age with a curious infirmity. The skin becomes like that of a reptile, covered with scales. The use of kava is very general in the Marquesas. The men assemble to drink it in little houses, where women cannot enter under pain of death, and before which they are not allowed even to pass. The law of Taboo is still in all its force among the natives of this archipelago, and woe betide him who dares to violate it when declared by a chief or a priest in reference to any place where a designed object is being carried on. A subtle poison, secretly administered, will soon overtake the profane person in cruel revenge of the outraged divinity.

It may not be without interest in terminating this sketch to say a word on the white population of these islands. It is composed of a mixture of Chilians, Peruvians, Mulattoes, Negroes, and English convicts escaped from Sydney, or deserters from ships, who live with and like the natives, marry among them, and are tattoed. In the number of these miscreants the French are in the minority. We do not find there any others than a few old dismissed soldiers, who are nearly become foolish and will never leave the land. They dwell in miserable huts, work as little as possible, and, like lizards, bask in the sun, their increasing age giving them no concern whatever. When their beards become white they have the advantage of selling them to some chief, who in order to possess this ornament (so highly prized among the natives) takes upon himself to provide food and lodging for the person with whom he has contracted for it!

La Flotte.

Voyage of the "Niagara" with the Atlantic Telegraphic Cable.

The Atlantic Cable is at fault! For the purpose for which it was laid it is at present useless! and all the rejoicings at the success of the great enterprise, alas, now lack the *value* of the fact! But the fact remains; its powers are on record, and the proof is established not only of the possibility of laying a cable in so deep a sea as the Atlantic, but that the insularity will also continue perfect at its greatest depth. The injured part, or that where continuity is broken, is said to be beyond two or three hundred miles from the coast of Ireland, and that for the present we must be content with exulting in what has been achieved. There is a fearful precipice of a mile in depth at 160 miles from Valentia; may it not have happened there, and may it not be wise to avoid this hereafter by going further North or South to pass into deep water. However this may be, the fruits of the enterprise have been tasted, and whether the virtue of the submerged cable is ever recovered or not, whether it ever again is made to speak the words of peace and good will between two great nations, it cannot long remain alone in its oosy bed. It cannot, even when in an efficient working state, do a tithe of the work required of it,—and we might well rejoice at the fact that has been established by it, knowing that what has been done by man's hands with the blessing of the Almighty may be done again.

We have already recorded our own half of the great work of depositing the cable, that work which was considered next to impossible, and the narrative abundantly shows the difficulties which were overcome. The other half must not be omitted, or its history will be imperfect, and moreover it is the share which our brethren of America have taken in the good work. It is truly said that those only who underwent the trial know the amount of difficulty which they overcame, and the privations which they endured; but the navy of both countries have performed their share of the work in spite of all difficulties, although the means of doing it have certainly been the most unfavourable to ourselves. The facility with which the *Niagara* got through her part of the work compared with the *Agamemnon*, will be evident in the following interesting narrative.

Thursday, July 29th.—The *Agamemnon* has now taken her position about a hundred fathoms from the stern of the *Niagara*, and the hawser has been passed between the two ships previous to making the splice. Before the commencement of operations, however, Captains Preedy and Aldham came on board of our ship, and Mr. Field and one of the electricians visited the *Agamemnon* to make further arrangements in regard to the work before us. The captains have returned to their ships, the splice is made, and the work of paying out proceeds, while the two ships move so slowly through the water that their motion is hardly perceptible. The rate of the cable is cer-

tainly much faster than that of either of the vessels, for the simple reason that it has to descend to a depth of about two miles, and it will take a considerable time to do that. The announcement comes from the electrician's office soon after the splice has been lowered, that the continuity is perfect; and with this assurance the engineers go on more boldly with the work.

The work of paying out the cable was commenced at one o'clock. The speed of the vessel was gradually increased after sufficient had been lowered over the stern to reach the bottom, and by two o'clock five miles had left the ship, and she had gone two miles from the starting point. The observation taken by the *Agamemnon* and *Niagara* showed the position of both ships as follows:—lat. 52° 9′, long. 32° 29′. To accomplish the work, the former has 1100 nautical miles and 300 tons of coal; while the latter had the same amount of cable and 500 tons of coal. This will give our ship from ten to fifteen days' steaming; while the *Agamemnon* has sufficient for ten days, should she burn at the rate of thirty tons per day. But if we should find that we have not enough to reach the land with, we will, if necessary, burn the spare spars; and should we be still further pressed, we will take down even the bulkheads for fuel. It is not very probable, however, that we shall be reduced to such straits. Mr. Follansbee, our chief engineer, assures us that we shall have sufficient. Let us once get sight of Newfoundland, however, and though every ton of coal in our bunkers were expended, we will contrive to get into Trinity Bay and land the cable.

We have already payed out a little over thirty miles of cable, although it is not yet seven o'clock, and the ship's speed varies from four to five miles per hour. There is a long distance yet, it is true, between this and Newfoundland, and thirty miles is but a very small fraction of 882 miles,—the distance from the point at which we made the splice to the telegraph station at the head of Trinity Bay. The depth of water here, according to the chart of the soundings, is 1,550 fathoms; but the depth, so far as our experience testifies, presents little or no obstacle to the laying of the cable. The sea is smooth, the barometer well up; and if we can only do for the next seven days as well as we have done since one o'clock, we shall be at Newfoundland by the 5th of August, and in New York sometime between the 15th and 20th of the same month. But we have been somewhat too hasty in our calculations, for our ship has just slowed down and the propeller has ceased working for the last ten minutes. There must be something wrong to cause this interruption. Let us take a look at the machine. The cable still goes out, which certainly would not be the case if it had parted. Ah! the continuity! that's it—there's where the difficulty lies. And as the electricians are the only parties who can inform us on that point, we at once go in search of them. A visit to their office explains the whole matter. The continuity is not gone altogether, but is defective—so defective that it is impossible to get a signal through the cable. Still there is not "dead earth" upon it, and all hope, therefore, is not lost. When dead earth,

as it is termed, is on the conductor, then, indeed, the difficulty is beyond remedy, for it shows that the conductor must be broken and is thrown under the influence of terrestrial magnetism. But the continuity is not gone, and although with darkening prospects, we are still safe while it remains, even imperfect as it is.

The old adage that "bad news travels fast," was never more fully realized than in this instance. The sad intelligence was known to every one on board the ship about fifteen minutes after it was announced to Mr. Field, and those who predicted the failure of the expedition fell back upon their prophecy, and hinted in a modest way at their own perception. It would be absurd to say that the occurrence was not discouraging; it was painfully so, for the hopes of some of us had really begun to revive, and we were gaining confidence every hour. Now nothing could be done. We must wait until the continuity should return or take its final departure. And it did return, and with greater strength than ever. At ten minutes past nine p.m., the electrician on duty observed its failing, and at 11.30 he had the gratifying intelligence for us that it was "all right again." The machinery was once more set in motion, the cable was soon going out at the rate of six miles an hour, and the electrical signals were passing between the ships as regularly as if nothing had occurred to interfere with or interrupt the continuity. No explanation could be given as to the cause of the accident that was to be relied upon. It was supposed, however, that it had broken on board the *Agamemnon*, and that the end was secured and spliced before it could get out of the ship.

A system has been devised for transmitting and receiving signals through the cable, from ship to ship, during the progress of paying out. This has been devised by Mr. Laws and Mr. De Sauty, the two gentlemen who have charge of the electrical department on board this ship. It consists in an exchange of currents sent alternately during a period of ten minutes by each ship, and which not only serve to give an accurate test of the continuity and insulation of the conducting wire, but also to give certain signals which may be required to be sent when the ships are far apart.

Friday, 30th.—All through the night the sound of the machinery never ceased, and the continuity remained perfect. At half-past three o'clock this morning the last flake of the forward spar deck coil begins to run out, and considerable anxiety is manifested in regard to the change to that on the forward main deck, which is immediately beneath. Every precaution, however, has been taken to guard against accident, and by a quarter to four the agony is over; the first turn of the new coil has been reached, and the cable is going out in splendid style. The ease with which the line runs out of the ship at this distance from the stern, for we are now about 270 feet from that point, is calculated to infuse new confidence into every one who sees it, but it is, after all, a confidence terribly shaken by vague fears of the future. We have five or six days to run before we get into Trinity Bay, and in that time, which in our state of suspense seems so many

years, what may not occur? We are afraid even to think of success, so often have our hopes been blasted by disappointment; the very thought of the magnitude of the undertaking brings with it a feeling almost akin to discouragement. Why, if three hundred miles have been submerged, is it not possible to lay two or three thousand? This is a question which appears very simple, and which is yet rather difficult to answer. It is easy to say that the breaking of the cable is caused by defective machinery, but who is able to account satisfactorily for the break of continuity which occurred in June last, after forty miles had been paid out of both ships? This it is which raises the gravest doubts in the minds of all, and which makes even the most hopeful apprehensive as to the result. That word "continuity" has created more uneasiness and anxiety than anything connected with the work, simply because it is seemingly beyond the control of scientific skill, and, once gone, cannot be restored by human ingenuity. At any moment we may hear that it has parted, and, sleeping or waking, the fear that it will haunts us like a nightmare. Oh, how we long to see that bleak and barren, but, to us, more desirable coast than any that ever met the gaze of enraptured voyager. What would we not give to be steaming up towards the head of Trinity Bay with the telegraph station in full view! Five or six days yet to run, at the end of which time we may be returning to Queenstown, again to bring the news of disaster and defeat. But we must not think of defeat now; we are bound for Newfoundland, and if Providence favours us, two or three weeks at the farthest will see us entering the bay of New York, after having successfully accomplished the greatest work ever undertaken by man.

But let us see what progress we have made during the last twenty-three hours, for it is now twelve o'clock, and we have been paying out since one yesterday afternoon. The following table shows the distance run according to the different logs therein stated:

By observation	89 miles.
By ship's log	99½ ,,
By engineer's log	102 ,,
By patent log	105·3 ,,

The length of cable payed out, according to the indicator attached to the machine, is 131 miles and 900 fathoms, or a surplus over the distance run, as shown by observation, of 42 miles and 900 fathoms, which is equal to about 48 per cent. This is a ruinous expenditure, and if it should continue at the same rate for the next two or three days, we might as well abandon the undertaking at once, turn our ship's head towards England, and make the best of our way back. It must not be forgotten, however, that in starting a large amount of slack was allowed, so as to prevent an undue strain upon the cable before some fifteen or twenty miles were payed out. Of course it is almost needless to say that we shall be forced into no such expenditure during the next twenty-four hours. Besides, we expect to be able to run out the cable at the rate of seven and eight miles an hour yet,

and experience has proved that the faster it is payed out the loss is proportionally diminished. There is sufficient to allow a surplus of 30 per cent.; and if that should not be enough, we can land the end at the entrance instead of at the head of Trinity Bay, as was proposed in the event of our having sufficient for the purpose. The depth of water during the last twenty-four hours has varied from 1,600 to 1,975 fathoms; but it appears to have no effect upon the laying of the cable,—in fact, the great depth of water is one of the least obstacles against which we have to contend.

The electrician on watch has just reported to Mr. Field that he received a despatch at twenty-one minutes past two from the *Agamemnon*, which is now some 230 miles off, and that they had payed out from that vessel 150 miles; and that at thirty-six minutes past two we inform them by electric signals that we have laid the same length. This shows that she is ahead of us by fifteen minutes, which is equal to a mile and a half.

We have thus far got along most successfully; but the remembrance of that unpleasant incident about the continuity still clings to our minds, and forbids us to indulge in any sanguine expectations. The weather, too, is beginning to look unfavourable; and, what is still worse, the barometer is falling, though slowly. The wind continues to increase towards evening; but up to seven o'clock it has not reached the magnitude of a gale. It is only blowing fresh—what sailors would call a stiff topgallant breeze—and as long as it keeps at that we are all right and have nothing to fear. Nine o'clock, and still no gale; but unless the barometer is astray we shall catch it some time during the night. Ten o'clock has just struck, but strange to say the wind is going down and the sea is following the example. The night is clearing up. Confidence is rising rapidly, and the bids in favour of its success are becoming heavy in the imaginary stock market which has been established on board. When it was reported that the continuity was not so perfect as we could wish, stocks went down with a terrible rush, and there were no bidders at any price. But twenty-four hours decided the matter; the Atlantic Telegraph ran up to 50 per cent., and continued going up till it reached the remarkable figure of 75. The cable is, indeed, the absorbing subject of conversation on board, and other things are only spoken of as they bear some relation to it. Nothing is thought of during the day but cable, and at night I believe two thirds of the crew don't dream of anything else. We have all become superstitious, and the man who has the most auspicious dreams is as eagerly listened to as if he were an infallible oracle.

"I dreamed last night," said one of these, "that we had laid the cable, and there was not a single break in it; and my dreams always come in true, as M—— can tell you; for I told him a thing that he found out had happened exactly at the time revealed to me." This was considered by some as proof positive, while those who looked with contempt at prognostications, auspicious dreams, auguries, omens, and such like, smiled upon the dreamer with indulgent consideration.

They were evidently pleased to listen, and although they would emphatically have contradicted the charge of being superstitious, the gratification which they manifested had somewhat of a leaning in that direction.

Saturday, 31*st*.—We have now one of the finest days for cable laying we have had during this expedition. The coilers who sit on the margin of each flake are amusing themselves in the intervals of their work by manufacturing little balls out of the tar, which has become hardened by exposure to the air, and throwing them down before each turn as it is taken up from the coil. As the cable passes out at the rate of from seven to eight miles an hour it strikes these balls with considerable force while it courses round the circle, sending them before it with still greater speed. The rate at which they run depends to a great extent on their spherical form, and he who makes them roundest is generally the winner. As no bets, however, are offered or made, no pecuniary advantage accrues to any of the parties concerned. Occasionally a lump of chalk, a small potato, or a piece of wax candle, is entered for the race, in which the chalk generally comes out a head. As it is impossible for any accident to occur from this, and as it affords a harmless amusement to the men, without interrupting the work, they are not interfered with. They are always ready at the end of each flake to lead the cable into the centre, and perform the operation so well that a kink is almost a matter of impossibility. It is a pleasure to look upon their earnest eager faces, and observe the care with which they handle the line while passing it from the outer edge of the circle to the cone. Although this operation requires to be repeated about fifty times a day, they always perform it successfully. If they allow a single kink to take place the expedition might be considered at an end, for it would be next to impossible to remedy the damage. Not a man among them who does not know that, and who does not realise the full importance of the duty with which he is intrusted. The reader must by this time be aware that in paying out the cable the greatest caution has to be observed to prevent it from kinking, and as there is a much greater tendency to kink near the cone, which is in the centre of the circle, than as you approach the circumference, the ship is always slowed down about five minutes before the last or outermost turn is taken up. As soon, however, as this critical part of the work is safely performed, word is passed to the engineer to "go ahead," and immediately after the huge propeller is again revolving with its former velocity.

Contrary to the predictions of some, the change from the forward main deck coil to that on the deck immediately below took place at half-past five this afternoon. It was thought that we should not have it all payed out before midnight, but the speed had been somewhat increased during the last twenty-four hours, and the rapidity with which flake after flake passed out satisfied those on watch that the coil would be exhausted long before the time announced. At least an hour before the change was made, the outer boundaries of the circle in which the cable lay was literally crowded with men, and

never was greater interest manifested in any spectacle than that which they exhibited in the proceedings before them. There were serious doubts and misgivings as to the successful performance of this important part of the work, and these only served to increase the feeling of anxiety and suspense with which they silently and breathlessly await the critical moment. The last flake has been reached, and as turn after turn leaves the circle every eye is intently fixed on the cable. Now there are but thirty turns remaining; and, as the first of these is unwound, Mr. Everett, who has been in the circle during the last half hour, gives the order to the engineer on duty to "slow down." In a few moments there is a perceptible diminution in the speed, which continues diminishing till it has reached the rate of about two miles an hour.

"Look out now, men," says Mr. Everett, in his usual quiet, self-possessed way. The men are as thoroughly wide awake as they can be, and are waiting eagerly for the moment when they shall lift the bight of the cable, and deliver it out safely. One of the planks in the side of the cone has been loosened, and just as they are about taking the cable in their hands, it is removed altogether, so that as the last yard passes out of the now empty circle, the line commences paying out from the circle below, or the orlop deck coil, as it is called. The men, who are no other than the coilers, have done their work well, and the applause with which they are greeted by the crowd of admiring spectators is the most gratifying testimony they can receive of the fact. They have hardly passed the cable out of the circle before they are received with as enthusiastic a demonstration of approval as the rules of the navy will permit. Such a clapping of hands was never heard at the Academy of Music, and if they had only been indulged a little, they would have raised such a cheer as would have roused old Neptune from the profoundest depths of his marine dominions.

The hatches, which were covered over in the construction of the circle, are opened, and the daylight is thrown upon the top of the coil, from which the first flake is now being payed out. This is our third day, and since the two ships started from mid-ocean, we have payed out a greater length of cable than was ever laid before. We hardly dare ask ourselves if we shall lay the line the whole distance—it seems too much to hope for—and we dread to think of the future. We count the day not by hours, but by minutes, and retire at night not to sleep, but to think through the tedious and weary moments of the all-absorbing subject. The sound of the machinery has become as familiar to us as that of our own voices, and when it is drowned in any other noise, we listen with eagerness to hear it again.

The barometer is consulted hourly, and its variations watched with a jealous eye, for we can now appreciate fully how much depends on the weather. So far we have been greatly favoured, but who can tell what another day may bring forth; and the weather-wise insist that the barometer never falls so low without a gale. The anticipation of such a thing is certainly not calculated to set one's mind at rest, be-

leaguered as it is by the fear that some untoward accident may happen to the *Agamemnon*, which would cause the rupture of the cable.

At twelve o'clock to-day we were in lat. 51° 5′, long. 38° 28′, having made the following run:—

Distance made good by observation . .	137 miles.
By ship's log	141¼ „
By engineer's log	142¼ „
By patent log.	137·6 „

while the length of cable payed out during the preceding twenty-four hours was 159 miles 843 fathoms, showing a surplus of twenty-two miles over the distance run, which is an expenditure of 17 per cent. The depth of water varied from 1,657 to 2,250 fathoms. Wind E.b.S.E. The *Agamemnon* informed us at a quarter to three o'clock, p.m., by telegraphic signal, that they had payed out 300 miles of cable up to that time.

Sunday, August 1st.—Confidence is growing stronger, and there is considerable speculation as to the time we shall reach Newfoundland. The pilot who is to bring us into Trinity Bay is now in great repute, and is becoming a more important personage every day. His opinion is solicited in regard to the weather, as he is supposed to know something about it in these latitudes, and he is particularly catechised on the navigation of the bay and the formation and character of the coast. We are really beginning to have strong hopes that his services will be called into requisition, and that in the course of a few days more we shall be in sight of land.

The night has passed without accident, the barometer is rising, and the wind has gone round to the N.W., a sure indication that we shall have clear weather. But the sea is not at all so smooth as it was the day before; it is in fact so rough as to favour the belief that there must have been a severe gale a short time since in these latitudes. The condition of the vessel is such as to alarm us greatly for the safety of the cable, should it come on to blow very hard, as the large amount already payed out, and the quantity of coal consumed, have lightened her so much as to render her rather uneasy in a heavy sea. Both wind and sea are nearly abeam, and the rolling motion which the latter creates, brings a strain on the cable which gives rise to the most unpleasant feelings. The sea, too, seems to be getting worse every minute, and strikes the slender wire with all its force. Every surge of the ship affects it, and as it cuts through each wave, it makes a small white line of foam to mark its track. The sight of that thread-like wire battling with the sea, produces a feeling somewhat akin to that with which you would watch the struggles of a drowning man, whom you have not the power of assisting. You can only look on, and trust either that the sea will go down or that the cable may be able to resist the force of the waves successfully. Of the former there is very little prospect, but of the latter there is every reason for hope. The struggle has been going on now for several hours, and there is no more sign of the cable parting than when it commenced.

The electricians report the continuity perfect, and the signals which are received at intervals from the *Agamemnon* show that that vessel is getting along with her part of the work in admirable style. What more can we desire? However improbable it may appear, there are some who seem to think less of their own lives than they do of the tarred line now running over the stern; and there are few who would not risk their own safety to secure that of the cable. This is paramount to all other considerations, aad every one feels that it is so, from the apprentice boy to the captain.

We have made a better run to-day than during any twenty-four hours since we started. At twelve o'clock we were in lat. 50° 32′, long. 41° 55′, having made from 139 to 145 miles, as is shown by the following:—

Distance run by observation . . .	145 miles.
By ship's log	139 „
By engineer's log	142 „
By patent log.	141·7 „

In running this distance we have paid out 164 miles 683 fathoms of cable, which shows a surplus of 19 miles 683 fathoms over the distance run by observation, or about 14 per cent. The depth of the water varied from 2,424 to 1,950 fathoms, and the wind, which blew from W.N.W., freshened very considerably. It did not, however, attain the force of a gale, and what was still more gratifying, began to fall as night approached, while the barometer continued rising.

Monday, 2nd.—There was a very heavy swell, like that after a gale, during the whole of this day, and our ship rolled as she never rolled before, and as we had hardly considered her capable of doing. The cable, however, exhibited no sign of parting, and ran out at an angle with the water that showed it was not affected by a strain greater than the 1,800 pounds which had been put on the brakes. As for the machinery itself, nothing could be more perfect than the way it worked—no jarring, no irregularity of motion, but everything in and about it was as steady and as perfect in its operation as clock work. It has been running four days altogether, and is just as reliable now as when it was set in motion after the splice was lowered in mid-ocean.

During the night the continuity was again affected, and although it was restored and became as strong as ever, yet it was for about three hours a very unpleasant affair. It was subsequently found that the difficulty was caused by a defect of insulation in a part of the wardroom coil, which was cut out in time to prevent any serious consequences. There were only a few on board the ship, however, aware of the occurrence until after the defect was removed and the electrical communication was re-established between the two ships. Both Mr. Laws and Mr. De Santy, the two electricians on board the *Niagara*, were of the opinion that the insulation was broken in some part of the wardroom coil, and on using the tests for the purpose of ascertaining

the precise point, they found that it was about sixty miles from the bottom of that coil, and between three and four hundred miles from the part which was then paying out. The cable was immediately cut at this point, and spliced to a deck coil of ninety miles, which it was intended to reserve for laying in shallow water, and was therefore kept for Trinity Bay. About four o'clock in the morning the continuity was finally restored, and all was going on as well as if nothing had occurred to disturb the confidence we felt in the success of the expedition.

At noon we were in latitude 49° 52′, long. 45° 87′, and had run by observation 154 miles, and by log as follows:—

By ship's log	144 miles.
By engineer's log	141·75 ,,
By patent log.	141·3 ,,

The length of cable laid out was 177 miles 100 fathoms for the preceding twenty-four hours, which is a surplus of 23 miles 100 fathoms over the distance, or 15 per cent. The depth of water was from 2,385 to 1,600 fathoms. Wind North. The signals which have been received from the *Agamemnon* inform us that she is paying out at the rate of seven and eight miles an hour, from which we derive the assurance that she has fine weather, and that, like ourselves, she is making the most of it. The night has set in fine. The barometer continues rising, and although the vessel still rolls considerably, we have had experience enough to tell us there is nothing to be feared from this motion.

Tuesday, 3rd.—This is the anniversary of the day on which Christopher Columbus discovered America—is it to be still further signalized as one of those on which the work of connecting the Old and the New Worlds was accomplished? Heaven grant that it may be so, although it seems almost like presumption to hope; and yet there is a strong undercurrent of confidence that seems to be the precursor of success. Although we are still about 200 miles from land, and a kink in the cable, or a hole running through the gutta percha into the conductor—and through which you could not even force a hair,—would render the labour of years utterly unavailing, we are so confident now, that we are calculating on seeing land to-morrow morning sometime about six o'clock, as the observation which was taken at noon to-day shows that it is not more than 150 miles off.

The great work of this morning was the change from the fore hold coil to that in the wardroom, which are at least 200 feet apart. This took place at eight o'clock in the morning, and as the time was known to all on board there was even a larger crowd assembled to witness it than I observed at any of the other changes. It was considered a most critical time, and, although the operation turned out to be very simple, it was anticipated by some with considerable uneasiness. The splice between the two coils had been made some hours in advance, and men were stationed all along the line of its course from the hold

to the wardroom. Mr. Everett and Mr. Woodhouse were both on hand, the best men had been picked out to pass up the bight or bend when the last turn should be reached, and one man, named Henry Paine, a splicer, was specially appointed to walk forward with the bight to the after or wardroom coil. As the last flake was about to be payed out the ship was slowed down, and by the time the last three or four turns came to to be payed out she could hardly be said to be moving through the water. The line came up more slowly from the hold, until they were nearing the bight, when it could not have been going out faster than half a mile an hour. One more turn and the bight comes up. There is not a sound to be heard from the crowd who are watching it with eager and anxious faces from every point of view. No one speaks or has ventured to speak for the last minute, except the engineers, and they have very little to say, for their orders are conveyed in the most laconic style, and the quick "Aye, aye" of the men show that they understand the full value of time. "Now, men," says Mr. Everett, "look out for the bight," as those in the hold hand it up to the men on the orlop deck, and it is passed from hand to hand till it reaches the platform and long passage which has been built upon the spar deck for this part of the work. Here the bight arrives at last, and Paine takes it in his hand, paying out as he follows the line of the cable to the wardroom coil. How anxiously the men watch him as he walks that terrible distance of two hundred feet, and think that if he should happen to trip or stumble while he holds that bight in his hand, the great enterprise may end in disaster. It is not a difficult task, but how often have things that are so easily performed been defeated by want of coolness. There is, however, such an easy self-possession about the man as he comes slowly after the long black line that inspires confidence. All hands have deserted the decks below, and follow him as he walks aft, and one in his impatience to get a glimpse of him has nearly fallen through the skylight of the engine-room, in which he has smashed several panes of glass in the effort to save himself. "Pick up the pieces," says Paine, in a vein of quiet humour, as he proceeds on his course without interruption, and, coming up to the wheel, which is immediately above the wardroom, he straightens the bight, and the cable begins to run out from the top of the coil on the deck beneath. His work is done, and as the line passes out of his hands, he receives a round of applause from the hands of the spectators, who, but for those terrible navy rules, would have greeted him with a cheer that would have done his heart good. As it is, they must give vent to their feelings in some way, and the exclamations of "Well done!" "That's the fellow!" "By thunder, it's all right!" "Good boy, Paine!" are not a bad compromise, after all. Besides, it might be rather premature at this time to indulge in any triumphant expression of feeling before we are even in sight of land.

The observations taken at noon to-day place us in lat. 49° 17′, long. 49° 23′, showing that we have run since twelve o'clock yesterday, 147 miles. Our run, according to the different logs, is as follows:—

By ship's log	137 miles.
By engineers' log	138½ „
By patent log	134½ „

In making this distance 161 miles 763 fathoms of cable were payed out, which shows a surplus of 14 miles 613 fathoms expended, or an excess of ten per cent. The depth of water varied from 882 to 742 fathoms. Wind N.W.

At half-past two the *Gorgon* made a signal to us, which, translated from the numbers, reads as follows:—

"I congratulate you on your success."

To this the following signal was sent:—

"Accept my best thanks."

The weather was magnificent, and the surface of the ocean was hardly disturbed by a ripple. We saw several icebergs, some of the most gigantic dimensions, rising from an altitude of from fifty to one hundred feet. They were fashioned into a wonderful variety of forms, castles, towers, forts, gothic church spires, columns, and one had a gigantic arch that seemed to rest on columns of emerald. The effect of the sun upon this was magnificent.

The calm that rested on the waters during the day was prolonged into the night, in the subdued darkness of which we can still discover some of the icebergs looming up above the water like immense rocks. There will be little sleeping on board the *Niagara* this night, for early morning will bring the long-wished-for land in sight, and every one will be on the look out.

Wednesday, 4th.—The morning of this day will be memorable in the history of the world, as that on which the *Niagara* first came in sight of the island outpost of the American continent, and bearing to its shores one end of that great electric chain which is to bring the Old World into the closest communion with the New. And what a morning this is—so bright and so clear within a few miles of the shores of a country which has been truly termed the land of fogs! There is not a breath of air, and were it not for its ever heaving pulse, the ocean would be as still and as motionless as the depths of the great plateau itself. As everybody is anxious to see the land, everybody is on the look out. The men in the foretop are not satisfied with that elevation, and have gone up some fifty or sixty feet higher, while the main and mizen masts have each a number of volunteers, and every one of whom expects to be the first to report land. The forecastle has its look-outs too, although there is no prospect of their getting ahead of the others.

About eight, the cheering cry of "Land-ho!" rang through the ship like a clarion note of triumph. Land at last, after six days of such anxiety and suspense as few men ever pass through,—six days of weary watching, of feverish restlessness, and ending in nights that brought no repose. Land at last—yes, there it is, defined boldly and

distinctly against the western horizon. Old friends at home, who believed we could not succeed, and who trembled as they read of that fearful gale and the dangers through which we passed, had you seen the glowing faces and the tears of joy that filled the eyes of all as we gazed upon the glad sight for hours, you too would have felt as we felt. With what deep earnestness we thought then of home, and how we conjured up before our mental vision the glad faces that would welcome us on our arrival.

It is now half-past two o'clock a.m., and we are entering Trinity Bay at a speed of seven and a half knots an hour, paying out the cable at a very slight increase on the same rate. A signal, signifying "All well," has been received from the *Agamemnon*, which must now be on the point of landing her cable in Valentia Bay, Ireland, which is about 1,640 miles from our present position.

A few minutes after five a steamer was reported far in the bay, and soon after she was made out to be the *Porcupine*. In half an hour her commander, Captain Otter, came aboard, and had a consultation with Mr. Field and Captain Hudson. He had, he said, given up all hope of seeing the *Niagara*, but had nevertheless posted lookouts on Bull Island, which commands a view of the bay and a long distance out to sea. The minute he heard of her arrival he sent a telegraphic despatch to St. John's to notify the people there of the fact. Mr. Field, himself, soon after went up to the telegraph station, which is fifteen miles from where our ship now is, with despatches for New York, which will be received there to-night at least an hour earlier than they are sent.

The *Gorgon* hoisted the American flag some hours ago at the fore, and the *Niagara* carries the English at the fore, while the telegraph flag floats from her mizen. Our progress up the bay is rather slow, on account of the condition of the cable already alluded to, and it is now settled that we cannot get to our landing place near the station before to-morrow morning. We are paying out the cable at three miles an hour.

Thursday, 5th.—At ten minutes past two this morning preparations were made for the landing of the cable, and the *Niagara* is brought to an anchor for the purpose. It is still quite dark, and we can only see the outlines of the hills which tower above us on every side, showing that we are in a completely landlocked harbour. We have just received the news from the electricians that a telegraphic despatch or signal has been sent from the *Agamemnon*, informing them that 1,010 miles of cable have been payed out from that ship up to the last hour. The intelligence is peculiarly gratifying at this time, and adds to the enthusiasm which every one feels. The operators have been at work all day and night, and still labour with as much zeal as at the commencement. Nobody has thought of going to bed, except a few who are so exhausted by their long watching as to render rest a matter of imperative necessity. Three of the *Niagara's* boats have been lowered, and two of these are to hold or buoy the cable at some distance from the stern of the vessel, while the third receives a sufficient length to

reach the telegraph station, which is about half a mile from the shore. As the *Niagara* has been brought to anchor, the cable is paid out over the machines with the aid of the little steam engine, which is put in gear with the paying out sheaves. About a mile and a half is lowered and coiled in the boat, and by sunrise everything is ready for the completion of the work.

Before the landing of the cable Captain Hudson notified the captains of the *Gorgon* and *Porcupine*, and about five o'clock the boats of the *Niagara* were ranged in a regular line and connected with a hawser, to tow that on which the cable was coiled to the landing place. The telegraph flag was displayed from the mizen truck, while the English flag was hoisted at the fore, and the American at the mizen peak. A similar compliment was paid to the American flag by the British vessels; and soon after our boats pushed off from the ship we observed others coming from the *Gorgon* and *Porcupine* to participate in the consummation of the great work. All the officers of the *Niagara*, with the exception of those on watch in the ship, were in the boats, the crews of which numbered altogether about sixty men. These, with the crews from the boats of the British ships, and all the officers, English and American, made a total of about one hundred men.

The landing place for the cable is a very picturesque little beach, on which a wharf has been constructed. A road, about the dimensions of a bridle path, has been cut through the forest; and up this road, through bog and mire, you find your way to the telegraph station, about half a mile distant. Alongside of this road, a trench has been dug for the cable, to preserve it from accidents to which it might otherwise be liable.

When the boats arrived at the landing, the officers and men jumped ashore, and Mr. North, first lieutenant of the *Niagara*, presented Captain Hudson with the end of the cable. Captain Otter, of the *Porcupine*, and Commander Dayman, of the *Gorgon*, now took hold of it, and all the officers and men following their example, a procession was formed along the line. As the cable was covered with tar, the handling of it was rather objectionable, but there were none who, under the circumstances, refused to take part in the landing. There were some, it is true, who would not at first put their bare hands to it, and who sought to protect them with gloves or by covering the cable with moss. This movement, however, was rather unpopular; so the gloves were taken off, and although part of the moss adhered to the cable, there was little of it used afterwards. The road or path over which we had to take the cable was a most primitive affair. It led up the side of a hill a couple of hundred feet high, and had been cut out of the thick forest of pines and other evergreens. In some places the turf, which is to be found here on the top of the highest mountains, was so soft with recent rains that you would sink to your ancles in it. The road maker or makers, whoever they were, had evidently done all in their power at the short notice they had to make it passable, and it is enough to say they succeeded to that extent, al-

though we could not help wishing that they had not placed the stepping stones so far apart, and had been a little more liberal in the use of timber. Well, it was up this road we had to march with the cable, and a splendid time we had. It was but reasonable to suppose that the three captains, who headed the procession, would certainly pick out the best parts, and give us the advantage of the stepping stones; but it appeared all the same to them, and they plunged into the boggiest and dirtiest parts with a recklessness and indifference that satisfied us they were about the worst pilots we could have had on land, despite their well known abilities as navigators.

This remarkable procession started at a quarter to six o'clock, and arrived at the telegraph station about twenty minutes after. The ascent of the hill was the worst part of the journey, but when we got to the top the scene which opened before us would have repaid us for a journey of twenty miles over a still worse road. There, beneath us, lay the harbour, shut in by mountains, except at the entrance of Trinity Bay, and there, too, lay the steamers of the two greatest maritime nations in the world. On every side lies an unbroken wilderness, and, if we except the telegraph station, at which we shall soon arrive, not a single habitation to tell that man has ever lived here.

The continuity, without which the cable would be utterly valueless, is as perfect now as it ever was. Mr. D. Laws and Mr. De Sauty, the two chief electricians, who have accompanied us from England, have "tasted" the current, and about a dozen others at the head of the procession have done the same thing. The writer himself is a witness on this point, and will never forget the singular acid taste which it had. Some received a pretty strong shock—so strong that they willingly resigned the chance of repeating the experiment.

About twenty minutes after we started from the beach, we reached the station of the Atlantic telegraph on this side of the ocean, where we found some half dozen of the inmates awaiting our arrival. The station is a large frame building two stories high, and eight windows wide.

On the arrival of the procession the cable is brought up to the house and the end placed in connection with the instrument. The deflection of the needle on the galvanometer gives incontrovertible evidence that the electrical condition of the cable is satisfactory. The question now is how shall we properly celebrate the consummation of the great event? How, but by an acknowledgement to that Providence without whose favour the enterprise must have ended in disaster and defeat? Every one feels that this is all that is necessary to make the celebration complete, and to mark the undertaking as the work of two great Christian nations. When, therefore, together before the telegraph station they understood the purpose for which they were assembled, Captain Hudson took up his position on a pile of boards, the officers and men standing round amid shavings, stumps of trees, pieces of broken furniture, sheets of copper, telegraph batteries, little mounds of lime and mortar, branches of trees, huge boulders, and a long catalogue of other things equally incongruous.

"We have," said the captain, "just accomplished a work which has attracted the attention and enlisted the interest of the whole world. That work," he continued, "has been performed, not by ourselves; there has been an Almighty Hand over us and aiding us; and without the Divine assistance thus extended us, success was impossible. With this conviction firmly impressed upon our minds, it becomes our duty to acknowledge our indebtedness to that overruling Providence who holds the sea in the hollow of his hand. 'Not unto us, Oh Lord! not unto us, but to thy name be all the glory.' I hope the day will never come when, in all our works, we shall refuse to acknowledge the overruling hand of a Divine and Almighty Power. It is he who can rebuke the winds and calm the seas. He works in a mysterious way for his people. His path is on the mighty waters. We have seen His power in the tempest; and when we have called upon him in the time of trouble, He has heard our voice. And yet how ungrateful we are for all his favours, and how soon we forget Him when the trouble passes away like a summer cloud or the morning dew. On a solemn occasion like the present we should feel more particularly our indebtedness to Him, and it is with a feeling of heartfelt gratitude we should acknowledge the many favours which He has bestowed upon us. There are none here, I am sure, whose hearts are not overflowing with feelings of the liveliest gratitude to Him, in view of the great work which has been accomplished through His permission, and who are not willing to join in a prayer of thanksgiving for its successful termination. I will therefore ask you to join me in the following prayer, which is the same, with a few necessary alterations, that was offered for the laying of the cable:—

"O, Eternal Lord God, who alone spreadest out the heavens and rulest the raging of the sea, who has compassed the waters with bounds till day and night come to an end, and whom the winds and the sea obey—look down in mercy, we beseech Thee, upon us, Thy servants, who now approach the throne of grace, and let our prayer ascend before Thee with acceptance. Thou hast commanded and encouraged us in all our ways to acknowledge Thee, and to commit our works to Thee, and Thou hast graciously promised to direct our paths and to prosper our handiwork. We desire now to thank Thee, believing that without Thy help and blessing nothing can prosper or succeed, and we desire humbly to commit all who have been engaged in this undertaking to Thy care, protection, and guidance. It has pleased Thee to enable us to complete what we have been led by Thy providence to undertake, that being begun and carried on in the spirit of prayer and in dependence upon Thee, it may tend to Thy glory, and to the good of all nations, by promoting the increase of unity, peace, and concord. May Thy hand of power and mercy be so acknowledged by all that the language of every heart may be, 'Not unto us, O Lord; not unto us, but unto Thy name give glory;' that so Thy name may be hallowed and magnified in us and by us. Thou hast controlled the winds and the sea by Thy almighty power, and granted us such favourable weather that we were enabled to lay the

cable safely and effectually. Finally, we beseech Thee to implant within us a spirit of humility and childlike dependence upon Thee; and teach us to feel, as well as to say, 'If the Lord will, we shall do this or that.' Hear us, O Lord, and hear us in these our petitions according to thy precious promise, for Jesus Christ's sake."

The "Amen" which followed the conclusion of this prayer showed what a sincere response it received from the hearts of all present and the depth of feeling it excited. "You recollect," proceeded the captain, "what our Saviour told his disciples, that if they had faith, even as a grain of mustard seed, they could move mountains. We have performed a work, or rather we are thankful to God for having performed a work for us, which has been ridiculed by a great many who regarded it as an impossibility. We have been peculiarly favoured in being permitted to be His agents, and we are pleased to acknowledge that it was through His instrumentality the work was performed."

At the close of the foregoing remarks the audience of "cable layers" dispersed, some to amuse themselves in short excursions about the grounds adjoining the station, and others in exploring the mysteries of the building itself. About an hour after, the captain, officers, and men assembled on the beach where the cable had been landed, and where they reembarked for their several ships.

Up to this point everything had been conducted with silence and in a spirit of moderation which some might consider as ill suited to the greatness of the work and the feeling which the occasion might reasonably be supposed to call forth. Had such a scene occurred in the harbour of New York, it would have been impossible to restrain the wild enthusiasm and excitement of the people. And who is there under the circumstances that would desire to do so? But the men who laid that tarred line across one half of the Atlantic, and who had passed six days in anxious watching, in terrible suspense, and in the midst of apprehensions, one day hoping against hope, and the next fearing when the prospect appeared brightest, thinking of the one thing by day and dreaming of the one thing in their short and troubled sleep, until it seemed as if on that slender cable their very lives depended, and the accident that proved fatal to its safety were to put an end to their existence—these men were not devoid of enthusiasm. No, no, there was no want of enthusiasm among them; but it was determined that they should not give vent to it till the work was wholly accomplished—till the cable was landed, till they had carried the end in safety to the telegraph station, and till they had returned thanks to that Providence whose agents they were in the working out of the greatest achievement which has ever been conceived or performed by man. Want of enthusiasm! Oh, had the people of New York—of the United States—of the Two Worlds, heard the wild huzza that went ringing over the hills, chasing the deer from their coverts, sending thousands of startled seabirds out upon the ocean, as if the land no longer afforded them a place of security—had they seen the faces of those men, they would understand what enthusiasm is, and how unjust the suspicion that denied them the possession of an

attribute only second to hope itself. A cheer it could hardly be called; it was one wild prolonged shout of delirious joy, such as might welcome the disenthralment of a nation, or the union of two worlds—a union in which we all participated, you and I and every one of us, and the remembrance of which will live with us to the end. How eagerly we all waited for the word that told us the time had come when we might give vent to the feelings that had been so long restrained. And when the first lieutenant of the *Niagara* called upon us to give three cheers, what tongue could have remained silent, were it even the last sound it could utter?

"Now, men, three cheers," he cried, and the last word had hardly been spoken when the demand was responded to with an outburst that came from the very depth of the heart. "Hurrah, hurrah, hurrah!" each louder and wilder than the last; and as the final cheer burst forth, the echoes took it up and repeated it again and again, till it seemed as if the wilderness around were peopled, and thousands of voices in every valley and on every mountain top joined in the glad shout of rejoicing. But three cheers are not enough—we must give another "for coming up"—that is, for the last pull, for the landing of the cable. And still another is demanded, one which cannot be refused if it were the last cheer we should ever give. It is "One for America and England," and it is called for by Captain Otter, of the *Porcupine*, a gentleman whose earnest labours and whose untiring energy in his share of the work entitle him to the warmest praise. It was Captain Otter who surveyed the Bay of Bulls Arm, and who guided us safely through all the intricacies of the passage the night of our entrance into Trinity Bay. To him and to Captain Dayman, of the *Gorgon*, who acted as our escort and pilot, from mid-ocean to the American terminus of the line, the Atlantic Telegraph Company are largely indebted. It is doubtful if the British Government could have selected from its long list of naval officers two who have proved themselves more capable of performing the work with which they were entrusted, or two who were more earnest in their exertions to promote the success of the great undertaking.

While the boats of the *Niagara* were on their way to that ship, they were cheered by the crews of the *Gorgon* and *Porcupine*, and at twelve o'clock a salute of twenty-one guns was fired from the former vessel.

As a large number of the men on board our ship had been at work all night, those who wished were allowed to "turn in," and there were very few who did not take advantage of the permission, and fewer still who did not enjoy their rest. They had worked hard and well, and took as deep an interest in the success of the work as those who had perhaps a greater stake in it.

Report of the First Voyage of the Missionary Packet "Morning Star"—*to the Caroline, Kings Mills, and Ralick Chain of Islands. By Capt. S. G. Moore.*

(Continued from page 457.)

November 8th.—At daylight passed Namarek, an island lying in the Ralick chain. It is a low coral island, said to be inhabited. At midnight hove to, supposing ourselves to be in the vicinity of the Covel Group, the southernmost island of the Ralick chain, where Dr. Pierson intends to locate. At daylight discovered the group about three miles to the leeward. [The Boston or Covel Group is in lat. 4° 36′ and 168° 48′ by the chart, with Namarek N.b.E. of it about seventy miles,—far out of the track from Strong Island.] By 7h. a.m., there were seventeen canoes off to the ship, manned by from five to ten men each. Some of these men had been to Strong Island, and on recognising Dr. Pierson and others whom they had seen there, they seemed transported with delight.

After breakfast the bell rang for prayers, when Dr. Pierson told the chief that we were going to pray, at which he sprang up on the quarter-rail, and cried out in a stentorian voice, "All keep still, all keep still, the missionary is going to keep Sunday;" at which they all kept silence till we were dismissed. Dr. Pierson informed them that we were coming back in about two moons, when he and Mr. Doane were coming to live with them.

A breeze springing up, we squared away for Pitt Island [about 250 miles E.S.E. of Covel Island]. For two days we had very foul weather. The 12th it cleared up, and we found by observation that the current had drifted us thirty-five miles due South. Pitt Island bore N.E., and the wind being from that quarter, we squared away for Apian, it bearing S.E.b.S. fifty miles. [By the chart it is S.b.E. seventy miles.]

During the night of the 12th we carried short sail, and at 7h. a.m. land was announced from mast-head. We stood along and doubled the S.W. point at noon. From this point to the S.E. extremity is sixteen miles. It is a continuous reef, dotted here and there with small islets, and through this reef Wilkes describes a passage leading into the lagoon. The wind did not permit us to get near enough to see it, and at sunset we stood off shore. I thought it best to give Farana a good berth, supposing that if the wind failed the current would be likely to set me over on Danger Reef, and this proved to be best, for after 12h., midnight, it fell calm, and at daylight we found ourselves twenty-five miles to the leeward. All that day we had light winds and soon no land was in sight. During Saturday night the wind hauled E.S.E., and we stood into the N.E. till 4h. p.m. Sunday, when we tacked South, supposing to head for Mathew Island, for which we kept a sharp look-out during the night. At daylight, Charlotte Island or Apian bore South, which explained the cause of our

not seeing Mathew Island, for again the current had set us ten miles West in sixteen hours.

The currents among the Kingsmills Group are very conflicting. Farther North we had a southerly current, here it is West and S.W., and one day we had a current N.W. Running close along the reef, I saw the passage described by Wilkes, and, lowering away my boat, I went in to examine it. I found anchorage off the mouth of the passage, and, although the situation was exposed, I made signal for the vessel to stand in, thereby hoping to avoid being driven away again by the current. Just at dark we anchored in 22 fathoms, within a stone's cast of the breakers. The tide was setting out furiously, and the wind being N.E., we tailed off shore and lay snugly during the night. The next morning I took a boat and sounded out the passage leading into the lagoon. I found 2½ fathoms low tide. Just inside the passage I found many rocks, some at the water's edge; but, deeming the passage feasible, and being very desirous to get into the lagoon, I determined to proceed.

The wind being fair at this time, and the sun shining bright, we made all haste to get under way. My first arrangement was to get two anchors over the stern, to which we bent hawsers all ready for running. Supposing that if the ship should suddenly encounter a shoal, as she did in Matalanim Harbour, and the anchor should be dropt ahead, she would run over and ground upon it, and perhaps it, if not the rocks, would make a rent in her bottom; but if anchors were suddenly dropt astern they would bring her up in time, and no danger of this kind be encountered.

All being ready, we weighed and stood in. As I before observed, the sun shining bright, and it being astern, I could see from the foretopsail yard all the dangers in my path. By a nice management of the helm, we wound our way along amid rocks and shoals for two miles, when we opened into a beautiful lagoon, the sight of which caused my heart to leap for joy. Mr. Bingham was aloft with me, and we congratulated each other; and we had abundant cause for gratitude to God for this success, for to lay at anchor off the reef we should be compelled to carry supplies in boats five miles across the lagoon, whereas now we lay within about one-fourth of a mile from where he is building his house. The bottom of the lagoon here is composed of beautiful white coral sand. It is fifteen miles long and five broad, with coral patches scattered here and there all through it. The site pitched upon for his residence will be described by himself, so I will just add its position, as found this morning by observation, viz., Apian or Charlotte Island, lat. 1° 52′ 30″ N., long. 174° 4′ 40″ E.

There are now two brigs lying here from Sydney, N.S.W., trading for cocoa-nut oil. They both came in through a passage that was unknown to me, and which is represented by the masters as being a much safer passage than the one through which we came. It is five miles from Wilkes's passage. Captain Richard Randall commands

one of the brigs. He has greatly facilitated our intercourse with the natives.

December 2nd.—Came in with pleasant weather, and I gave orders for getting under way. We all repaired on shore and joined in religious exercises; after which we bid an affectionate farewell to those dear friends who have journeyed with me thousands of miles. Just one year after receiving Mr. and Mrs. Bingham on board I bid them farewell, pleasantly located on their island home. The first day of their going on shore here was the first anniversary of their marriage. Making all sail, we quickly passed out at the southern passage, and soon Apia, with all its interesting associations, sank behind the wave.

3rd.—Strong breeze from S.E., with a heavy swell.

5th.—At noon saw Covel Island right ahead. The breeze freshening, we came up very fast and ran along the South side of the island. There were several fishing canoes off the S.W. side, and as soon as they saw the dove flying at the main, they knew us, and some came alongside, while others hastened off to the shore to convey the glad news of our arrival. After rounding the S.W. point of the reef, we hauled up for the passage, and soon were met by fifteen or twenty canoes, having on board about 150 people, who manifested their joy by every demonstration possible—shouting, dancing, and singing. To see the vessel, with all her sails and colours set, beating up to the passage with a train of fifteen or twenty large proas in her wake, alive with laughing, shouting natives, was a scene that was calculated to awaken the liveliest sensibilities in the heart of both missionaries and seamen. The King was among the first on board, and on being presented to his Majesty, he took my hand and pressed it upon his breast, at the same time placing his upon mine, this being a token of friendship. It being Saturday, I was anxious to find an anchorage, to avoid lying off and on during the Sabbath.

Leaving the vessel, I went in to sound out an anchorage. The passage to the lagoon led in between two islets, flanked by wide reefs, between which I found a depth of twenty-five fathoms, with room sufficient for the vessel to swing clear of the breakers. From this position the bottom fell off at an angle of 45°, the danger therefore being that if we dragged at all it would be off shore. Going on board and seeing all ready, we stood in and dropped both anchors. It being near night I was unable to make any further explorations. Here we were where no vessel ever was before—at least, so says the oldest man on the island—in the mouth of a passage where the tide ran prodigiously, and heavy squalls rising in the E.N.E. The first one that struck us started our anchors, and from this time till Tuesday night I scarcely closed my eyes to sleep; the harsh, grating sound of the anchors, dragging over the rough coral bottom, sounded like distant thunder.

At daylight, Sabbath morn, the wind hauled E.S.E., and then died away, when torrents of rain fell and continued till Monday morning, when it cleared up in fine weather, and, hearing of another anchorage

farther South, I hove up to go in quest of it, but after a faithful search, I found no such anchorage existed.

Through Dr. Pierson, I informed the King of my determination to enter the lagoon, who promised to have men stationed on the reef to haul the vessel through the next day, if the wind continued ahead. During the night the tide set us far around to the East side of the island and we did not get up in time to go in. Thursday morning came bright and clear, and we saw the natives mustering on the reef in great numbers. The wind was light from the East. Taking in all my square sails, and having anchors and lines all ready, we stood in. The tide was flowing. Just as we arrived at the confluence of the two passages I let go an anchor to bring her to, for the purpose of running lines to the reef. There were about 150 men on the reef in readiness for their task, and most nobly did they accomplish it, for she did not touch on either side. After clearing the passage the Rev. Mr. Gulick offered prayer on deck; after which we made all sail, set our colours, and gave three cheers, taking possession of the lagoon. We stood over to the East side of the lagoon, and then up to the anchorage. Here we lay perfectly secure. Boats can go and come at any time. Good water can be procured from Dr. Pierson's well. Their houses are about forty yards apart, situated in a grove of lofty bread-fruit trees, and at this season of the year it is most delightfully cool and pleasant.

Christmas morning commenced heaving short. Getting under way on a lee shore with a strong wind required some caution. Having carried out our kedge, all hands clapt on, and we soon perceived that we were hauling it home. Weighing it, we carried it much farther off. This time it held on, and we proceeded to heave up our anchor. So soon as it cleared the bottom our kedge warp parted, and we were obliged to let go anchor again. I thought it was time now to go to work. Getting up two new coils of four stranded Manila rope that we had brought out from Boston with us, we weighed the kedge the second time, and backed it by another, and carried it out 100 fathoms. There being at this time sixty to seventy natives on board, we hauled the vessel ahead and let her hang till after dinner, being now sure of getting my anchor up so I could fill away and slip my lines. This was handsomely effected, and after getting an offing I sent the officers to weigh the anchors and bring them on board. All being ready and the wind being fair, we squared away and ran through the passage and hove to off the Mission.

The Board of Directors having recommended the first day of January as being about the time of my taking my departure, I wished to spend the intervening six days, if the wind permitted, in running up the whole length of the Ralick chain and establishing the position of its several islands. Covel Island is forty-five miles too far West on the English chart. For forty-eight hours it was very foul weather, and I kept on by the southern islands without seeing them. Sabbath morning came in bright and clear, and we took good observations. It

was clear at noon also, and we found our correct latitude. Having ascertained our position I found that we were at noon about forty miles South of the Menzikoff [no such name], and twenty miles West of the North end of the Mosquito Group [no such name]. We were steering on the wind, heading N.N.W. At 2h. p.m. land was announced two points on our lee bow. After having carefully looked over my figures, and finding no error, I concluded that this land was part of the Menzikoff Group, and that it had been laid down wrong on the chart. Going aloft, I perceived at once that we were approaching a compact, small coral island, not being more than a mile and a half in circumference. Well, is this a discovery? It is not marked down on the latest charts, either English or American. Finley says nothing about it in his description of the islands, and I know that it would be an easy matter for so small an island to be passed by and not seen. We landed on the West side. There were twenty-three inhabitants on the island, men, women, and children. It was covered with a thick growth of pandanus and a few low cocoa-nut trees. The position of the island is lat. 8° 15′ N., long. 167° 25′ E.

At 5h. p.m. we came on board and proceeded on our course. By the course we were steering I expected to be up with the land by midnight. At 12h. midnight we shortened sail and all hands were ordered on the look-out. In half an hour we saw the land,—wore ship off shore; at 3h. a.m. tacked in again, and at daylight was close in. The West end of this group takes the form of a fish-hook. Shoals, reefs, and islets are thrown together promiscuously. I saw one dangerous shoal running off S.E. a great distance. None of these shoals or reefs are laid down on Norie's chart.

As we doubled around the westernmost islet a canoe came off, in which were four natives. They conversed freely with my man Rolua, who shipped with me at Ebon. This Rolua is a native of the Hogolu Islands. He, with two others, now remaining at Ebon, were drifted or blown off, and after many days were spent in fruitless toil to get back, they put before the wind, and the first land they saw was Namareck, seventy miles N.N.W. from Ebon. He says he wants to get back to his native island, and, expecting to go thither next voyage, I believe he will be of essential service to me if he learns to speak English.

Leaving Menzikoff with strong N.E. trades, we stood away toward the *doubtful group* of Kahabia. Seeing no indications of land in this vicinity, the next we sought for was Udia Milai. This island is the north-westernmost of the Ralick chain. It was discovered by Kotzebue in 1825. He says,—"In regard to this island, or group of islands, I can say but little. It was blowing a heavy gale at the time, and I only saw the West side." Was very anxious to explore this group, from this very fact that it is so little known, but it was blowing strong with a heavy sea, and I thought I saw extensive reefs between two islands about eight miles distant from each other. The land trends N.E. and S.W. A long reef ran out northwardly, over which

the sea broke with dreadful violence." Position of N.E. islet: lat. 11° 45′ N., long. 165° 40′ E.

We are now clear of the Ralick chain. It will be necessary for me to stand to the N.N.W. till I get through the N.E. trade-winds, which at this season of the year may reach to the 25th parallel. Favourable winds for making East longitude are expected in about 30° N. Before closing my report of these islands it may perhaps be well to make a few remarks relative to the manners and customs of the people who inhabit them. The two chains, Radack and Ralick (meaning East and West), might be regarded somewhat in the light of a large town, with alleys, streets, and avenues running through it, the inhabitants passing and repassing, engaged in like occupations, seeking the same amusements, and governed by the same laws. A great uniformity of character is observed. Influenced by no seductions, and fearful of no invasions from foreign tribes, they live a peaceful and harmless existence, supported by the same benevolent hand that rears the towering bread-fruit, under whose shady boughs they eat, and sleep, and chant their simple tales, and listen undismayed to the murmurings of old ocean, as he casts his thunders upon the coral strand.

That space of ocean comprehended between the two chains, and stretching from the Bonham Islands, on the South, to the Reinski Karsokorff, on the North, we will call the "Radack Sea." This sea, three hundred miles long and one hundred broad, has been, as yet, but partially explored, and in which it is supposed there exist dangers of a formidable character. How far this may be true of the southern portion I am unable to say; but having made a cautious survey of the northern arm, I am prepared to believe that navigation is endangered more by conflicting currents than by labyrinthine reefs. As may be supposed, among so many islands, there is no regularity to the set of the current. Sweeping up against the coral walls, and turned aside into channels where it is interrupted from the same natural causes that produced its check in the first instance, it is thrown into whirlpools and eddies, with no particular converging point, and hence only calculated to confuse and mislead unwary navigators.

In whatever light we may regard the opinion of men, or with whatever severity frown upon those who oppose us in our estimate of native character, there will always be found, and that too among some of our most enlightened shipmasters, men who, though possessing a considerable share of metaphysical acumen, seem to give place to and foster very many erroneous impressions regarding the character and disposition of those natives, among whom there have occurred those melancholy instances of massacre of which we are often made acquainted. Viewing this subject in its abstract, we cannot but conclude that there exists a substratum in metaphysical science which has been overlooked or not comprehended by them. Acting in concert with preconceived opinions which have no foundation, they often find, and to their cost too, that *man* is *man*, endowed with certain inalienable rights; and when those rights are violated who will dare

dispute their resorting to a most severe retaliation. It is a well known fact that there was a vessel cut off at Covel Island in 1852. We are induced to inquire what were the causes that led to this melancholy event, and our inquiries will lead to a satisfactory explanation in the fact that this vessel was there for the purpose of decoying off females and taking them to California. There arrived in San Francisco, while I was there in 1850, a vessel that had been chartered for this very purpose, bringing many females from different islands, to be sold for an exorbitant passage fee. Though the enormity of these crimes stand out in bold relief, still, where they are resisted and men fall a sacrifice to them, there are those who are quick to cry, "Oh! the wretches, the thieves, the murderers!" In a conversation with a Captain White at Strong Island he learned that I was bound to Covel Island. "Do you go armed?" he inquired. "No, but I have boarding-nettings." "Put them up," said he, "don't trust one of those wretches on board; they are cannibals, and they will be sure to take your ship if they can; I drove them off by displaying my fire-arms."

Let us see how far subsequent events proved the cautionary remarks necessary. The boarding-nettings were put up and triced out In due time Covel Island hove in sight. There comes one of their large proas black with men. The crew are called, and stationed on the defensive fore and aft. Here come five, ten, fifteen more proas. Affairs had now assumed quite a serious posture. Recollecting that I had an old, rusty horse-pistol somewhere below, I was about to go in quest of it, to see if it could be made to stand fire. The head proa had now approached within pistol shot. A powerful man with heaving breast stood foremost among the group. His head was encircled with a wreath of white flowers, and the lobes of his ears enormously distended by ear-rings a foot in circumference, and which were firmly secured by the elasticity of the membrane surrounding them. "There, I know that man," exclaims Dr. Pierson, "let him come on board. He was at Strong Island." The chief had now recognised Dr. Pierson, and commenced shouting to his comrades as they approached in the other proas, and begging to be allowed to come on board. To this I assented, and he and nine others were allowed to come on board, and not the least indecorum was manifested during their stay. Repairing on deck after breakfast, I ordered some boiled rice to be brought up for them. As they gathered around the large dish, something was said that afforded Dr. Pierson some merriment. Inquiring what it was, he informed me that they were canvassing the captain's want of good manners in not supplying them with spoons to eat their rice with! Are these Captain White's cannibals, murderers, degraded savages of the worst description? Yes, here they are as orderly and well behaved as any men on earth. It seems to me that the *Morning Star*, like her great prototype, sheds a benign influence, for, wherever she goes, and savage men congregate beneath the out-spread wings of the peaceful Dove, their fierce natures seem to become tranquilized and subdued.

We have just weathered a heavy gale of wind from N.E. The

wind has come from the eastern board all the passage, driving us up to 36° N. To-day, the 22nd, we have a fine breeze from S.S.W. It is clear and pleasant, and all hands are employed in painting. We have anchored fifteen times, discovered an island, determined the extent and position of Eschultz Group, explored the northern arm of the Radack Sea, were the first to enter Covel Island lagoon; and for the amount of work done our chapter of accidents is small, being one sounding-lead lost and two oars broke.

The Indian Ocean considered with Reference to the Wants of Seamen.

(Continued from p. 421.)

After Pulo-Panjang is passed, the ship should steer S.E. for Pulo-Oby, seventeen leagues beyond it, giving it a good berth in order to avoid the dangers near it.

Pulo-Oby to Manila.—A vessel proceeding from Pulo-Oby to Manila, should pass South of Pulo-Condore, and thence South of Pulo-Sapata; then N.E. until she has reached the parallel of 12° N. lat.; and being then North of all the banks, may make for Manila. To pass the Redang Isles to the coast of Cambodia during the month of March, a ship should get as far East as she can, because at this time of year, near Pulo-Oby, westerly currents prevail. At this season, also, the wind is from N.E. and E.N.E.

Macao to Manila.—Vessels trading between Macao and Manila continue to do so during both monsoons. On leaving Macao with that from the S.W. for Manila,, every possible advantage is taken of the wind veering to S.E. or East, when they get to S.S.W. or South towards the Macclesfield Bank. From thence they are sure of reaching Manila; indeed, unless the wind becomes South or S.S.E., a vessel would reach Manila on one tack, and with the wind from South she would sight Goat Island, and the land South of the bay.

During the N.E. monsoon, when bound to Manila, they pass through the Lema Channel, and keep as far East as possible, making for the N.W. part of Luconia, towards Cape Bolinao. During this season every precaution must be taken against the current setting to leeward. Having reached the latitude of the cape or the coast near it, a ship should keep off it to avoid shoal water, and having passed the Sisters, should continue about four or six leagues from land till she is to the Southward of the islands and the dangers off Point Capones. From thence she would continue along the coast for Manila Bay.

Manila to Macao.—The S.W. monsoon being fair for going from Manila to Macao, a vessel from thence would steer direct for the Great Ladrone, and with the wind at S.W. on approaching the coast of China she may keep this island N.b.E. or North. If the wind

inclines East she should steer for the Great Lema and take that channel.

A vessel leaving Manila Bay for Macao, during the N.E. monsoon, should keep the land as far as Cape Bolinao, and from thence should stand out to sea if the wind permits her to make Northing. But with N.E. and Northerly winds, especially if the vessel is not a good sailer, she should keep along the coast as far as Cape Bojador before making for the coast of China.

Pulo-Sapata to Manila.—During the S.W. monsoon, on leaving Pulo-Sapata for Manila, a vessel should make the parallel of 13° N. lat., by passing outside the shoals in the Eastern part of the China Sea. Having reached the parallel of 12° 30′ or 13°, she would make direct for Goat or Luban Island, which are both about twelve or thirteen leagues S.W. of the bay of Manila. Having passed three or four leagues North of Goat Island, she would steer for Mariveles Island or Corregidor, at the entrance of Manila Bay, keeping nearer the North than the South shore, and when six miles West of Corregidor, she would steer for that island, and pass between it and Tas-de-Foin. From thence it is only eleven leagues to Manila, and eight or nine to Cavite.

Manila to Pulo-Aor.—The N.E. monsoon gives a fair wind for a vessel from Manila to Pulo-Aor and the straits of Malacca and Banca. On leaving the bay she would steer West as far as the parallel of 12° N. lat., and continue this course as long as she is not sure that her longitude is less than 111° E. When she is certain of being sufficiently to the West, she should steer for Pulo-Sapata, allowing for the westerly currents, which at this season are sometimes very strong and set a vessel much out of her reckoning. Should Pulo-Sapata not be seen on reaching its parallel, soundings should be taken, and then a course steered for Pulo-Aor.

Route for the Gulf of Tonquin.—To reach the gulf of Tonquin or the river of that name from where she now is, she would take advantage of the S.W. monsoon, and would keep along the coast of Cochin China, as far as Cape Chonmay, the South point of the gulf, or as far as Tiger Island. Thence she would steer North, passing the West coast of Hainan Island, at a suitable distance according to the soundings, which rapidly decrease as its surrounding banks are approached. These should not be found in less than 14 or 17 fathoms. A ship not making Hainan Island when in latitude 19° N. and in 24 or 26 fathoms water, should steer for the Norway Isles, about thirteen leagues from the entrance of the Tonquin River. In taking this route, when approaching the entrance of the river, she would steer according to the tides, which may greatly retard her course, setting her out of the gulf.

Gulf of Tonquin.—During the N.E. monsoon on leaving the Tonquin River, a ship should steer so as to sight Hainan Island, but should not approach this island from the N.W., and should take care not to get into less water than 17 fathoms on the banks, which extend from eighteen to twenty-one miles from its shores. Easterly winds

often prevail in the gulf during the N.E. monsoon, although off the mouth of the gulf at the same time the true monsoon may be found.

Passage along the Coast of China from South to North.—In making to the Northward against the N.E. monsoon, along the East coast of China, from Macao to the Chusan Isles, there are several routes which we will point out. The first is by working to windward, between Formosa and the coast. The second, passing East of this island and working along its outer shore; and the other, by keeping well out to sea, Eastward of Formosa. This last route Commander Goldsmith says is the best. and he tells us that in eighteen or twenty days a vessel may make the passage by it from Hong Kong to Chusan. This passage against the N.E. monsoon generally produces much injury to sails and rigging, on account of the constant succession of bad weather. There is generally a breeze strong enough to oblige her to double reef, while at the same time she has a heavy sea to encounter.

A ship bound Northward having left Hong Kong during this monsoon, if the wind permits may leave by the Ly-ee-Moon Channel, and pass the Nine-Pin Rock, and work along the coast, under Single Island and the group to the Northward of it. Here the tide, during the syzygies, flows N.E. between one and two miles an hour. The wind is generally from E.N.E., or else comes down along the coast, veering more Northerly when taking its direction, and remaining steady at N.N.E. as soon as the Lamock Islands are passed.

Having passed Single Island and the Acoong-Chow, a remarkable sharp pointed rock, she may stand into Harlem Bay boldly, and pass Mendoza Island. Care should, however, be taken not to approach its South coast at less than three miles from Ty-Sing-Cham or Pedro-Blanco, in order to avoid a dangerous rock, which only shows at low water by a heavy break.

The vessel, if still going North, should keep near the China coast as far as Ma-Ush, in order to profit by the tides and avoid the current, which is constantly setting to the S.W., and when the weather is uncertain, it is even better to anchor under shelter of one of the outer points of the island than to stand out to sea.

In the bay of Ti-Sami, a little West of Hie-Che-Chin, and under the point of Cupehi, there is a good anchorage in 8 or 10 fathoms of water. At night care should be taken to give the edge of the breakers a berth of two miles, for banks and rocks extend from under water, and it must not be approached.

Having reached Cape Ma-Ush, the route to be taken must be decided on, whether it be to continue North along the China coast, or to proceed East of Formosa. Sometimes the coast of China is left before reaching Cape Ma-Ush by a ship taking the outer route East of Formosa. But it is not difficult at any season to round this island to the East, because on the outside of it there is a current flowing North at a rate of two and a half or three miles per hour.

First Route—through the Strait of Formosa.—By the route along the coast of China, a vessel will find some difficulty in getting to the Northward from the Lamock Isles, as far as those called the White

Dogs constant Southerly currents are encountered, which in the middle of the strait, and according to the strength of the monsoon, attain a rate of as much as three miles an hour; a ship would therefore adopt short tacks along the Eastern part of the Lamocks, and then keep as near as possible to the land from the point of Jokako to the environs of Tongsang Bay, the shores of which are the best along the coast, and may be approached without danger. The little group of islands situated North of Rees Channel, forms a shelter from the sea that she may take advantage of; and if at night the ship should be to the East of these islands, it will be wiser to anchor under their lee than to run out to sea in this latitude, where the tides are strong and the direction of the currents very uncertain. In the dark nights, too, when North of these islands, a ship should not stand at all into the bay of Hoo-Tow-Shau, as several vessels have been lost on the rocks off its entrance. We may consider this part, says Captain Mundy, as the only dangerous one in the whole of this route. The rocks, called the Two Brothers, are a good mark to recognize, they are detached from the coast, and have no dangers near them. From thence the ship may keep along the coast towards Red Bay, but there are several single rocks to be avoided, although no dangers have yet been discovered under water, if we except a shoal situated three quarters of a mile from the coast, and three miles South of the anchorage of Red Bay. From this anchorage, in fine weather, Chapel Island will be seen, which in the day time may be passed either to the East or West, taking the necessary precautions to avoid the Merope Shoal.

After having rounded Chapel Island, the islands at the entrance of the port of Amoy will be seen. If the weather is cloudy and the wind fresh from the North, the North coast should be kept on board, and with a smooth sea, which will be always the case with the wind from North or N.E., anchorage may be taken in 30 to 40 fathoms. Continuing to the Northward as near the land as safety will allow, the ship would enter the bay of Lee-o-Loo, passing near Dodd Island, and then into the bay of How-e-Tow, anchoring during the night, or, if obliged to do so, by the tide.

The pagodas of Chinmo and Chin-Chew, both visible at some distance, are good objects to distinguish in this part for rectifying the position. On losing sight of the latter, when Cape Tong-Boo is passed, less sea will be found and the ship may stretch out further from the land up to the isles of Ock-Seu, three barren rocks, under the lee of which there is no shelter except close to them. Having rounded them, the island of Lam-Yit may be hugged close. In these parts, during the whole of the N.E. monsoon, heavy winds are encountered, with squally weather and a strong current to about ten miles from land, so that in order to get to the Northward a ship must again make short tacks for the Three Chimneys, taking care not to go too close to the reef islands or to Cape Double. She would pass West of Isle Turn-about a remarkably good landmark.

To pass this point is perhaps the greatest difficulty of the whole

route, and if the monsoon came with but half its strength, the ship might be driven away South of Ock-Seu, unless she anchored under the lee of one of the islands while the lee tide is running, or else kept entirely under the land. The swell also being heavy, the ship is strained and twisted about by carrying a press of sail.

When she has rounded the Three Chimneys, the first islands seen are the White Dogs, which may be passed on either tack, according to the weather, for Matson Island. But by making short tacks the vessel will keep a smooth sea until passing Chang-Chi. Off the South part of this island there is a good anchorage, which should be made use of by a vessel intending to communicate with Fou-Chow-Fou, but which she would do sooner by boat, leaving the vessel anchored at the White Dogs. If the weather is tolerable, there will be no more swell after passing Chang-Chi, and when the Trio Rocks are passed, the ship would work between the islands of Larne, Alligator, and Tong-Yang, taking great care to avoid the Larne Rock, although it is always visible. Between these islands there is anchorage in 17 or 18 fathoms. In the syzygies the current of tide attains a rate of three miles; but at neaps the tide is not more than one and a half mile per hour. The ebb sets from West, then changes to S.W. and South. In the morning the wind generally veers Northerly.

From the last mentioned group the island of Pih-Seang should be made, and from this as far as Kew-Shan the ship may work up the coast, leaving the different groups of islands in shore of her to the West, until she reaches Hih-Shan. Either by day or night she may stand without fear between these islands and the coast; but when she has reached Patahecock, (elevation 450 feet,) the most Southerly of the Kew-Shan group, she would not pass West of it excepting in the day, as there are dangers in the channel, and the approaches to Cape Montague are not to be trusted.

Between this cape and Patahecock there is a very dangerous rock, which the ship should pass East of, and then work between the sunken Pylades rock and Bear Island. Some rocks, called the Welps, would then be seen, and then the Corkers, a very remarkable group of rocks. They might be rounded on either side and on either tack. If the ship works East of Kew-Shan, she would pass near the Mouse, a low rock, covered at high water.

In this part the tide sets N.W. and S.E.; and good anchorages may be found from 4 to 8 fathoms.

These directions are given in detail because they will afford some idea of the navigation of the China Coast, for it must be remembered that a good passage can only be made by keeping the coast on board.

(To be continued.)

Tidal Drift in the Strait of Dover.

Sir,—The very gratifying reception accorded by you to my former paper on the "Effect of Winds on the Tides in the Strait of Dover and its Vicinity," and the interest which attaches to the subject, together with the importance of a thorough understanding of it, induce me to trespass again upon your valuable pages with a few more practical observations regarding the set of the tidal stream in the same locality.

In order to obtain clearer and more decisive proofs of the actual direction of the preponderating tidal influences, bottles, containing letters addressed to me by the Harbour-Master at Ramsgate, (and carrying a request that the finder will state the time, place, and date at which they were picked up by him, and then forward them to me at the earliest opportunity,) are cast overboard by him and others at different parts of the narrow channels off that port and in the Strait of Dover.

Since the 11th of August last nine of these messengers have been sent adrift to try their fortunes, and four of them have found their way to me.

It is my intention, with your permission, to send you from time to time the results of these "bottle tracks," for the benefit of seamen navigating these dangerous channels; and I think it not improbable that some information as to the phenomena of the tides in this locality will be procured by their means, not only deeply interesting but highly important also.

On the 13th August two bottles were cast overboard: the one by Captain Martin, off Ramsgate, the harbour bearing at the time N.W., two miles distant; the other by Captain Clark, of the *Ondine*, mail packet, Boulogne bearing at noon (which was the time fixed on by previous agreement) South, distant fifteen miles. The flood had just made to the eastward, and high water was due at Ramsgate at 2h. p.m. The results of the cruize of these two little messengers may best be told by quoting the foot note appended to each by the finder or the person to whom they were taken for transmission to me.

That thrown overboard from the *Ondine* bears the following note:—

Ceci a été trouvé sur la plage entre Dunquerke et Nieuport, en Belgique, au hameau de la Paune, pur un pècheur nommé Thomas Prévost, habitant la Paune, ce jour d'hui 28 Aout 1858, a 4 heurs du matin.

Pour Thomas Prevost.

From which it will be seen that fourteen days elapsed ere it was picked up off the coast of Belgium, between Nieuport and Dunquerke.

The other, thrown overboard off Ramsgate by Captain Martin, fell

into the hands of Mr. Phillips, Lloyds' vice-agent at Nieuport, who transmitted it to me with the following notice:—

Nieuport, near Ostend, 28th August, 1858.

Sir,—The enclosed was found in a bottle washed ashore near the village of Lombardzyde, to the eastward of this port, at daylight this morning.

J. PHILLIPS, *Lloyds' Vice-Agent.*

A third bottle was despatched on the 14th August by Captain Martin, Ramsgate Harbour again bearing N.W., three miles distant; time, 1h. p.m.; flood tide just made to the eastward, and high water due at 2h. 40m. p.m.

This letter came in the same envelope which brought the last, with the following note from the same gentleman:—

Sir,—The enclosed has just been brought to me (6h. p.m.) having been picked up in the course of the afternoon at the same place, or very near thereto, where the former one was found this morning.

I may incidentally mention here that this gentleman states that he has in his possession a chart of that part of the Flemish coast drawn for his father by Captain Martin in the year 1822. A curious coincidence, truly, that the very first bottles despatched by the zealous old Harbour-Master, so many years afterwards, should fall into the hands of the son of his old owner.

Now, what do these messengers tell us?

We will take the *Ondine's* first. Boulogne bearing South, fifteen miles distant, she would be in the fairway of the Strait of Dover, not far perhaps from the Varne and Ridge Shoals. The bottle was set adrift upon the young flood, two hours before high water at Ramsgate (which has only ten minutes difference from Dover, the standard port, at full and change). It would therefore be carried along with the flowing tide and half tide for six hours and a half nearly, which, at the rate of three knots of drift per hour, would bring it over towards the Flemish coast nearly upon a line joining the North Foreland and Dunquerke.

But it would seem not to have reached the meeting of the North Sea and half tidal waters. Yet five knots an hour only, under canvas, would have taken it over the boundary and into the northern stream of ebb, and it would have passed on into the German Ocean, progressing still with a fair tide till low water. On the contrary, however, it is taken back with the returning half tidal waters into the Strait of Dover, and during the first eight days encountered moderate weather, winds light from the S.W. generally; the following four days it was under the influence of N.E. fresh gales, and for the remaining period strong N.W. winds.

Atmospheric influences would appear to have counteracted each

other, and the little cruizer was found not far from the position it must have reached upon the first flood,—off Dunquerke.

The other two, perhaps, yield more of interest in following their track. Cast overboad upon the young flood, close inshore, off Ramsgate, they would by high water or shortly after (being carried on by the half tide) reach the confluence of the tides, and, being caught by the outset of the combined streams of the Thames, Medway, and Swale, would be carried away on a tangent towards the coast of Holland.

And no doubt they continued returning to this meeting of the waters day after day, each time making short progress to the eastward, until at length drifted on shore, as shown, by that tendency of the tidal streams, which there can be little doubt has caused the formation of the shoals upon that coast called the Flemish Banks.

The courses they took must have been almost identical, as they were found so close together and within so short a period of each other,—showing with what exactness the tides will produce one uniform result when uninfluenced by atmospheric disturbances of a serious nature.

They were acted upon, of course, by the same winds which affected the *Ondine's* bottle; from which consideration I should at once say that this could not have reached the meeting of the waters, for had it done so, being some miles nearer over to the French coast at starting, it would certainly have been landed a tide or two earlier than the others; instead of which it was found in the offing on the same day not having yet reached the shore.

It may be asked, Why did the second Ramsgate bottle gain so much upon the first, which had twenty-five hours start of it? We do not know for certain that it did gain much! The first was found at daybreak, and might have been landed during the night; the second was picked up at 4h. p.m., nearly. But supposing the second did gain, I think the cause is a very simple one, and the effect very natural, for when the first was returning for the second time to the eastward upon the half tidal flowing water, its successor, being then under the full influence of the outsetting stream from the Thames, would be swept down at much greater speed athwart its course, which would naturally lessen the distance between them, and this effect might continue, although in decreasing ratio, as both gradually receded further from the outsetting influence and approached the Flemish coast.

It would be interesting and important to discover how far this outsetting influence extends. We hope for further development of this interesting subject.

ARTHUR B. MARTIN, F.R.A.S.
Naval Academy, 157, *Leadenhall Street.*

To the Editor of the Nautical Magazine.

MAGELLAN STRAIT AND ITS SPANISH SETTLEMENT IN JULY, 1857.—*Extract of a Letter.*

A succession of very severe gales from the westward detained us in the eastern entrance of the strait for fourteen days, and although many attempts were made during that time, we only succeeded in getting so far to the westward as Gregory Bay.

On the 12th of August we were enabled to leave that anchorage, and the same night reached the Chilian settlement at Sandy Point. This settlement—which is kept up by the Government of Chili more, I believe, with the view of maintaining the right of their flag than from any advantages, commercial or otherwise, which are derived from it—offers no refreshments or supplies of any kind to passing vessels; on the contrary, they are in a manner dependant on what ships may be able to spare them. Formerly, wood was cut and stacked ready for steamers, but the practice has been discontinued; vessels, however, may cut for themselves without making any payment.

The colony is presided over by a captain in the marine corps, who has two subalterns, a surgeon, and forty-five privates under him, and their whole number, including settlers, amounts to one hundred. They are supplied with rations (the bare necessaries of life) twice a year by a Government brig. Very little ground is cleared, and they cultivate scarcely sufficient vegetables for their own use. The Indians pay periodical visits to the settlement and supply it with Guanaca meat, though, I suspect, scantily.

Early on the following morning (the 13th) we left, taking their despatches for Valparaiso. Passed Port Famine, which is now entirely abandoned, and at night anchored in the Bay of San Nicolas, seven miles eastward of Cape Froward, which is a very convenient stopping place, easy of access or egress at any time.

Before daylight on the morning of the 14th we proceeded on, and reached Bonga Bay, in Crooked Reach, by sunset. Here I intended to cut wood, get observations for rates, and swing the ship. The two latter, owing to the boisterous state of the weather and heavy rains which prevailed, we but partially succeeded in; but the observations for magnetic dip were satisfactorily obtained, and the ship filled with wood.

Bonga Bay I do not consider a very desirable anchorage. It is confined, the water very deep, and the surrounding land so high that it is subject to violent squalls. It must, however, be considered safe, though, I should say, far inferior to Port Gallant, where I had intended stopping could I have reached it without losing distance.

On the morning of the 18th we left Bonga Bay, and were so fortunate as to get through Crooked and Long Reaches, and fetch Port Tamar by dark. Here we anchored for the night; and having satisfied myself that we had sufficient fuel on board to steam through Smyth and Sarmiento Channels, I determined to do so and enter the

Pacific by the Gulf of Penas, in the hope of being able to settle on some good stopping places and get more satisfactory observations for local deviation.

At daylight on the 19th the wrecks of two vessels were discovered on the beach. I landed to examine them, and found them to be the remains of two sealers of between 200 and 300 tons burden, which had evidently been driven on shore during an easterly gale, to which the port is quite open. All valuables had been removed, and they were very rotten and partially broken up, having been on the beach, I should judge, more than twelve months. Port Tamar is only suitable, in my opinion, as a stopping place during westerly winds.

Just as we weighed our anchors a fresh wind sprung up from S.E., with very thick weather. This wind is of such rare occurrence, and offered so fair an opportunity of gaining an offing, that I reluctantly decided on giving up the inner route. I was the more induced to do so from the many delays we had already experienced, my great anxiety to get to our working ground with the least delay, and the very great uncertainty at this time of the year of the weather allowing me to carry out my intentions in the narrow channels. The result proved that much time at least was saved, for we were abreast the Gulf of Penas, with an offing of one hundred miles, in two days and a half, whereas it would not have been possible, under the most favourable circumstances, to have made our exit by that gulf in less than ten days, before which time we arrived at Valparaiso.

If I were to offer an opinion on the expediency of a vessel passing through the Strait of Magellan during the winter season from the Atlantic, founded on our own experience, I should certainly say she was likely to make a long one. We were exactly three weeks, but general rules cannot be laid down on isolated cases. Had we arrived in the eastern entrance a fortnight earlier we should have been clear in a week. Had we taken the passage round Cape Horn the ship must have been very much strained, and probably the crew suffered severely. Two large ships arrived here a day after us, having come round the cape, suffered very severely in the heavy westerly gales, and made longer passages than we did.

Under any circumstances, a steamer, of however small power, I think should take the strait. With a powerful steamer, under moderately favourable circumstances, the whole run might be made with ease in forty-eight hours, and all wear and tear saved.

As regards easterly winds, which are said to prevail during the winter season, I am of opinion that unless blowing very strong in the eastern entrance they are not felt in the western parts. The S.E. wind which carried us out made several attempts to blow for three days, but was always checked by westerly winds in the narrow channels before it had gained any strength. It also failed us when we were abreast Cape Pillar, and had we not had steam to get an offing of fifteen miles, we should have been placed in an anxious position, in a heavy confused sea, just at the commencement of a long dark night.

Having gained this offing, we got the S.E. wind again fresh, which carried us a hundred miles off shore.

Admiral Fitzroy's advice to steer West until in the meridian of 80° should never be neglected. Even with a strong southerly wind a vessel should not attempt to run along the coast, but steer West until in that meridian, or even farther West, for winds are certain to follow from that quarter, with which a ship may preserve a safe distance from the land, and generally fetch Valparaiso without a tack.

On Manning the Navy.—*By Captain W. L. Sheringham, R.N.*

(Continued from page 470.)

Sir,—I propose to conclude my remarks on the subject of Manning the Navy by the addition of a few words on the *Royal Naval Coast Volunteers considered as a Naval Militia.*

The reports of the Captains of the Coast Guard Divisional Ships appear to be unanimous in asserting that success has attended the experiment of raising this Naval Force for Home defence as far as it has yet been made, a result which I anticipated would be the case if proper caution was used in selecting suitable men for the service.

In my report to the Admiralty as far back as 1854, I stated that the men raised in the 1st Division, taken in the aggregate, were of a description both morally and physically above the ordinary class met with on the coast,—and, consequently, not only might a very large portion of them be expected to attend when called out for training, but that a moderate amount of drill would render them an efficient and valuable body of men in a case of emergency,—and that I had every hope, after the first training was over and the nature of the service better understood, and when all doubt of a strict fulfilment of the conditions under which they enrolled were removed, the service would be duly appreciated and there would be no difficulty in completing the force to the number it was proposed to raise.

Such is my opinion now, and I am perfectly confident—at least, as far as my own division was concerned—that had I been assisted during the enrolment with a small staff of petty officers, the greater part of the Force would have been raised in two years, for the number of men raised in the 1st Division from February, 18 4, to December, 1856, was 700, something more than one-third. Upwards of 500 presented themselves for training, and of the remaining 200 there were discharged into the Navy, 45; into the Army, 10; by Admiralty order, 9; died, 15; imprisoned, 7; and absent in coasting vessels, 10: leaving only 106 to be accounted for out of the 700.

Many of these finding that for three years they had not been called out for drill, as they were led to expect would be the case, at those times when they were least occupied, and which they looked forward

to as a reward for remaining at home, became disgusted, and very naturally, I think, considered that as the war was at an end they might safely embark on a foreign voyage, for surely 21*s.* a year could scarcely be considered an equivalent for refusing an advantageous offer.

This I know was the case, for many were the bitter complaints made to me by the men that faith had not been kept with them.

My object for entering into this detail is for the purpose, if possible, of removing a misconception very generally entertained that the experiment has failed,—which I for one most emphatically deny, although I must admit from one cause or another has been sadly imperilled. But it is not to be wondered at that the public should be so indifferent as to the success of this great national measure when many officers of high rank were equally so. Neither need we feel surprised at reading in professional journals and hearing in professional clubs mischievous and ill founded statements both as regards the description and number of men enrolled or the probability of their being forthcoming if their services are required. For three years it lay untouched, with few friends willing to save it from the impending destruction which most people thought awaited it.

I trust, however, that the day has now arrived when these misgivings will disappear, and that the Royal Naval Coast Volunteers will take their place in public estimation by the side of its sister service, that invaluable, national, and patriotic Force—the Militia of England.

If, then, it is determined that the measure shall not be abandoned without a fair trial, it still remains to be seen how best it may be maintained in vigour and popularity,—a question the importance of which entitles it not only to the most mature and deliberate consideration, but to much anxious thought and friendly nurture.

My own experience, and that I believe of the officers, who with myself were originally appointed to raise this Force, led to the conclusion that the majority of the Naval Coast Volunteers would not have enrolled but with the view to avoid compulsory service in the Royal Navy. True they expressed themselves willing to give their services to the country at a time of national peril, encouraged as they would be, of course, by pecuniary and other advantages. Hence a due consideration of this important fact will, I think, make it evident, that to render the service really popular, the utmost care must be taken in no way to alarm the prejudices of the men, by a too close combination of that Force with the Queen's Service.

It will be readily admitted, that there must always exist a mutual dependence of one department of the State on another, in order to preserve that harmony and stability so essential to secure good government. But it is no less true that in many of these combinations, the links which connect them should not be too evident,—for very different elements and prejudices may constitute and govern two services, which to outward appearance are perfectly analogous. No better illustration of this fact can be advanced than that of the two

services of the Militia and the Queen's Army; and the question at once suggests itself, whether it is probable that the Militia could be maintained in its present popular and efficient condition, if it were commanded by those officers of the Queen's Service who were retained on the effective strength of the Army subject to be constantly removed, and therefore, as a natural consequence, strangers to the habits of the men, indifferent to their welfare, and ignorant of the condition and the constitution of the Force they were appointed to command.

In the Militia the sympathies of the officers and men are the same,—touch the man and you affect the officer; and hence comes that *esprit-de-corps* which prevails throughout the Service, and really constitutes its stability and popularity. The prejudices against the strict discipline of the Royal Army are considerably mitigated in the Militia; the officers are more conciliating, for they full well know that their credit is at stake for the strength and efficiency of their regiments, and hence every one of them becomes, so to speak, not only a jealous and watchful friend, but a zealous and successful recruiting officer amongst their dependants and neighbours.

Both officers and men of the Militia, when disembodied, return together into civil life; the latter therefore feel that the former still remain their all-sufficient safeguards that their conditions of service shall be strictly fulfilled; that they are ever ready to check any attempt at interference with their prescriptive rights, and the better able to do so as their means and station in life place them beyond the fear of any pressure on the part of the executive.

If all this be acknowledged, then why should not similar results follow a similar organization of the Royal Naval Coast Volunteers? Such an organization would be the sure means of rendering the Force, not only popular with the men, but no less so with the gentlemen of England.

Another important question appears to have been lost sight of, viz., the immense increase of the active list of officers which will be necessary, if the Coast Volunteers are to be officered from that list. At present we have scarcely more than would be required if an extensive war was to break out, to supply the demands of the Fleet. I submit, therefore, that it is not very visible where the officers for 10,000 or 15,000 additional men are to come from, if called out on any sudden emergency. But, I repeat, even if they are forthcoming, Naval officers, subject to be called upon to serve in the Fleet, are not well adapted to serve in a Naval Militia also. Their man-of-war notions and prejudices are always in full force, and they must ever remain more or less unacquainted with the nature and peculiarities of a Militia Force.

It is patent that considerable ignorance prevails at this moment on the subject,—and it can scarcely be otherwise, for the changes that are continually taking place amongst the commanding officers affords them but little opportunity to study their duty, and certainly must considerably destroy their interest in it.

Subaltern officers as a permanent part of the Force there are none, for the officers of the District Ships, whose duty it is to drill the men when embarked, have nothing to do with them when they are out of the ship, and are only too happy when their backs are turned to go over the side. Neither can it be expected that the officers of the Coast Guard can have any particular liking for the Coast Volunteers,—in fact, I believe they hate the name of them,—feeling how much it adds to their already onerous and arduous duties to look after them.

The men of the Naval Coast Volunteers, as the force is at present constituted, will soon find out they have no constant or permanent officers to command them; there will be nothing of that neighbourly connection between them which there is in the Militia; they will perceive that their officers are continually changing, each new set governing them according to their own different view of discipline,—one set of officers checking insubordination by the dangerous parade of bayonets, and threat of corporal punishment; and another, more judiciously, appealing to milder measures, and using the arms of the civil power. But whatever controlling measures may be adopted, the fact will soon be evident that in the government of the Force, martial law, the inherent dread of all civilians, must never be intruded except in very extreme cases, or when the Force is embodied for active service.

This leads once more to a consideration of the present combination of the Naval Coast Volunteers with the Coast Guard,—a measure which there is too much reason to suspect will prove a failure; and what would be still more lamentable, that the failure (should it come to pass) would affect the stability of the whole measure: and the Force may be found to crumble away ere it is scarce mature, for want of a popular class of officers for its command.

We all know that half the men that have been raised and are likely to be raised for this service, are anything but unfriendly to smuggling, and at heart have a strong prejudice against the Coast Guard. I can safely aver, that very few amongst the licensed watermen would have enrolled if I had depended on the assistance of the Coast Guard, even if they had been disposed to have rendered me any. I was told by the men in as many words: "It is of no use your sending the Coast Guard to us, we will have nothing to do with them: they oppress us: they interfere with our pursuits by continually overhauling our boats." And beyond all contradiction, the same feeling of dislike exists among that dogged and unimpressible class, the fishermen.

My most successful argument with these people was, that I had nothing to do with the Coast Guard; and until I could convince them of that fact, not a man of them would come forward, or even listen to what I had to say. I had to impress upon their minds that I was not among them for the purpose either of kidnapping them for the Navy, or of prying into their smuggling habits. My business was to raise a body of men for the defence of the coast, and for that only; and it was not without considerable difficulty that I succeeded eventually in gaining their confidence.

In truth they have naturally an aversion for each other, and I firmly believe the Force will not hold together long—if the Captains of the District Ships depend principally on the Coast Guard to recruit for them. The Commanding Officers should break up their districts into sub-divisions, and appoint a Petty-officer, carefully selected from the Force itself, to every twenty-five men,—which they have the power to do by their instructions unless the clause has been rescinded. They should be required to keep a list of the men in their sub-divisions, and be the recruiting Petty-officer,—the customary allowance made to him for each volunteer he raised on his acceptation and attestation by the Captain, as is the case both in the Army and the Militia.

Perhaps this prejudice against the Coast Guard may not now be so strong. I speak only from my own experience of a year or two past; but this experience leads me to the inevitable conclusion, that if the attempt be made to amalgamate these two services, the Coast Guard and the Coast Volunteers, too closely, the efficiency of both will be thereby impaired, the present confidence of the Coast Volunteers will be lost, and many who are now enrolled will leave the Force as soon as their term of engagement has expired, a fact which we shall very shortly be in a position to ascertain.

It will be no easy matter to persuade these men that every Coast Guard officer and man is not a spy upon them, and will handle those roughly with whom they may have squabbled, or suspected of smuggling propensities, when they get them within their grasp as volunteers. On the other hand, it is no safe measure for the Revenue Department to bring two services, of origin and views so opposite, into close contact. I have heard the remark made, "That it will cut both ways: if we do suffer a little from contamination, it will at all events be a good system of espoinage over the suspected." My reply to this is, It may possibly be so; but let that fact become once known among the Coast Volunteers, and as sure as they are men, away they will go. They will very naturally say, "We want independent officers, who will take care of us, who will watch over our interests, who will see fair play between us and the Government, and who will protect us rather than otherwise from the petty annoyances of those Revenue officers."

This leads us to another very important point of our subject, which cannot be too strongly urged,—the paramount necessity of keeping rigid faith with the men. Already, I fear, some discontent has manifested itself in consequence of calling the men out for training during their busy season, whether as fishermen or boatmen,—it was a solemn promise made to them, that they should not be interfered with at those periods, and it is neither necessary, nor politic, nor just to do so.

The question then which naturally suggests itself is this, "Where are the officers for your Force to come from?" if they are not to belong to the Navy, or the Coast Guard.

My answer to that question is this, and I would emphatically express it, with a full conviction of its great and enduring importance,

satisfied with the efficacy of my proposal, whenever it shall be followed out in its entire principle. Call forth, I say, and bring into useful action, that inherent love of the sea, for which the majority of our countrymen are notorious, whether they be of high or low degree; and let the Coast Volunteers be headed, and led in the service of their country, by the gentlemen of the country, who are qualified, or who may be willing to qualify themselves, for the service, of home pursuits, like themselves, whom they know, and in whom they could strictly confide.

I confidently believe that there would be no lack of officers for so honourable a service among the higher classes of this country. Let them then be enlisted as coadjutors in its defence, and I am impressed with the belief that the Royal Naval Coast Volunteers would soon become the most popular Force that ever was raised in this land.

A glance at the Army List shows that many of the retired officers of the Army are now officers of the Militia, and so might many of the officers for the Coast Volunteers be selected from the reserved lists of the Royal Navy. Those especially, whose habits in command are well known, but who have taken leave of active service. There are many excellent officers among these, well suited for the service, and who would be glad to have the opportunity of distinguishing themselves in so noble and honourable a cause as that of the defence of their own shores. Throw open such appointments to yachtsmen, to officers of the great commercial companies, and to those of the mercantile marine generally,—in a word, from the collier boy to the peer of the realm: then indeed would England possess an efficient "Naval Militia," which after all is, I conclude, the great object in view, instead of a combined service, the success of which must always remain as a subject of doubt and misgiving.

Commissions in the Militia do not proceed from the Horse Guards, —nor should those in the Coast Volunteers depend on the Admiralty. It may be asked, "In whom, then, should this important patronage be vested? Surely not in the Lord Lieutenants?" Perhaps not; but there are Vice-Admirals of Great Britain and Ireland, and why should there not be Rear-Admirals also? who might be unexceptionably professional men of eminence and general importance, selected by the First Lord of the Admiralty, and let the appointments to the Naval Coast Volunteers be entrusted to them, as they safely may be.

In conclusion, I would observe, that difficulties must be expected in commencing and first carrying out the working details of an experiment of so extensive a nature as here proposed. Yet they will not be found insuperable; and it is at all events a subject well entitled to the most careful consideration; and, beyond all doubt, the present is the time for entertaining it.

In fact, the materials are now collecting for an extensive Coast Defence of this country, that can fall under no other designation than that of a "Naval Militia." Its successful and permanent establishment is yet a problem to be solved, requiring the greatest care and circumspection at every step. And, therefore, the question I

would submit for the consideration and decision of men whose judgment and information are superior to mine, is this:—Can that defence be constituted on a firmer basis than on the patriotism of the sons of the soil? or can it have a better model to follow, than that which has stood the test of time and experience, its Sister Service the Militia?

W. L. SHERINGHAM, *Captain, R.N.*

THE ATLANTIC CABLE.

Atlantic Telegraph Company, 22, Old Broad Street, September 21st.

Sir,—I am instructed by the Directors to forward for publication the annexed report from Mr. Varley, the electrician to the Electric and International Telegraph Company. He is one of the gentlemen who has been consulted by the Board in reference to the present state of the Atlantic Cable.

Yours truly,

GEORGE SAWARD, *Secretary.*

To the Editor of the Times.

Report of the State of the Atlantic Telegraph Cable.

London, September 18th.

I arrived at Valentia on the evening of the 5th inst., when I found that no words had for many days been received through the cable from Newfoundland.

On the 6th, 7th, 8th, 9th, and 10th, I tested the cable at intervals in four different ways to ascertain its condition. The following are the results:—

1. There is a fault of great magnitude at a distance of between 245 and 300 statute miles from Valentia, but the locality cannot be more accurately ascertained until a portion of the cable, twenty or thirty miles in length, has been tested against my standard of resistance, and until the log has been consulted to ascertain the amount of slack paid out. I would suggest that the piece of cable at Greenwich be carefully measured and tested against my standard, in order to obtain the most correct estimate of the distance of the fault. Assuming, however, that it is 270 miles, and allowing 22 per cent. for slack, it is possible that the chief defect is in shallow water,—410 fathoms.

2. The copper wire at the faulty place above alluded to does not touch the iron covering of the cable, as is proved by its forming a voltaic element, which gives rise to a continuous positive current from the copper wire varying very little in tension.

3. The insulation of the wire between Valentia and the fault is perfect, or at least contains no defect of sufficient importance to be perceptible, or to materially influence the working were the cable otherwise perfect.

4. The copper wire is continuous, and consequently the cable has not parted. Faint signals, or reversals, are still received from Newfoundland, but the power used will shortly eat away the exposed copper wire in the faulty place by electrolytic decomposition.

The actual resistance of the fault appears to be at least equal to ten miles of the cable, but is most probably greater.

Taking it at its lowest resistance, viz., ten miles, and assuming that Newfoundland is only using 180 cells of Daniels's battery, the strongest current received thence during my stay was only 1-24th part of the force that it should be were there but this one fault. When it is, however, borne in mind that on the other side they are probably using more power, and also that the defect first alluded to probably offers more resistance than that assumed, viz., ten miles, it is evident that there is another and more distant fault, the approximate locality of which I could not pretend to estimate at this end without being able to speak to Newfoundland.

From authentic *data* shown to me at Valentia I am of opinion that there was a fault on board the *Agamemnon*, before the cable was submerged, at a distance of about 560 miles from one end and 640 from the other.

The following are the *data* in question, but on what occasion they were obtained I am unable to state. They were, however, probably taken when the ships were at Queenstown:—

Testing of Coils on Board the Agamemnon, consisting of about 1,200 *Statute Miles of Cable.*

1. When the upper end was disconnected the current entering the cable from a battery was . . . . . 8·5 parts.
2. When upper end was put to earth current entering the cable was . . . . . 10·5 „
3. Current going out of upper end of cable to the earth . . . 5 „
4. When the lower end was disconnected the current entering the cable was . . . . . 8·5 „
5. When lower end to earth . . . . . 10·5 „
6. Current going out of upper end of cable to earth . . . 4·5 „

showing that if there was a fault it was nearer to the upper end, but not far from the middle of the coil.

When 200 miles had been removed from one end of the coil (but from which end I am not at present aware), leaving 1,000 miles, the amounts were—

1.	7·5 parts.	4.	8·5 parts.
2.	10·25 „	5.	11·5 „
3.	6·5 „	6.	6·5 „

indicating that there was a fault, by rough calculation, at about 560 miles from one end, and 640 from the other.

With the 200 miles of cable amounts were—

1.	2 parts.	4.	— parts.
2.	40 ,,	5.	40·5 ,,
3.	39·5 ,,	6.	39·5 ,,

Test of the Entire Cable on Board the Agamemnon and Niagara,—viz., 2,500 *Miles.*

Battery at Agamemnon end.

1. Current entering the cable, the *Niagara* end being disconnected	45 parts.
2. *Niagara* end to earth	49¾ ,,
3. Current flowing out at *Niagara* end to earth	15½ ,,

Battery at Niagara end.

4. Current entering cable, *Agamemnon* end being disconnected	35¾ parts.
5. *Agamemnon* end to earth	37 ,,
6. Current flowing out at *Agamemnon* end to earth	14 ,,

indicating considerable leakage on board the *Agamemnon.*

I am also informed that the currents through the cable, even immediately after it was submerged, were so weak that relays were useless, and that not one perfect message was recorded by them, everything that was received being read from the deflections of a galvanometer.

By comparing the above *data* with those of the new cable now making by Messrs. Glasse and Elliott for the Electric and International Telegraph Company, the amount of current which entered the 1,000 miles of cable when disconnected at one end should not have exceeded 2 or 2·5 parts instead of 7·5 and 8·5 parts.

The inference by rough calculation, therefore, is that there was a fault offering a resistance equal to 1,000 or 1,200 miles of cable situated at a a distance about 560 miles from one end of the 1,200-mile coil on board the *Agamemnon.*

This, however, cannot be the fault first alluded to, situate at about 270 miles from Valentia, but may have been the one which caused such alarm when the ships were 500 miles from Ireland and when the signals ceased altogether and never certainly recovered.

It is not at all improbable that the powerful currents from the large induction coils have impaired the insulation, and that had more moderate power been used the cable would still have been capable of transmitting messages.

To satisfy myself on this point, I attached to the cable a piece of gutta percha-covered wire, having first made a slight incision in the gutta percha to let the water reach the wire; the wire was then bent so as to close up the defect. The defective wire was then placed in a jug of sea water and the latter connected with the "earth." After a few signals had been sent ftom the induction coils into the cable, and, consequently, into the test wire, the electricity burnt through the incision, rapidly burning a hole nearly one-tenth of an inch in diameter.

When the full force of the coils was brought to bear on the test wire by removing them from the cable and allowing the electricity only one channel—viz., that of the test wire, the discharges, as might be expected, burnt a hole in the gutta percha under the water, half an

inch in length, and the burnt gutta percha came floating up to the surface.

The foregoing experiments prove that when there are imperfections in the insulating covering there is very great danger arising from using such intense currents.

The size of the present conducting strand is too small to have worked satisfactorily even had the insulation been sound. With a strand of larger dimensions less intense currents would be required, and both speed and certainty increased.

It is not, however, altogether impossible that some intelligible signals may yet be received through the cable, as stated in my previous communication.

C. F. VARLEY,
Electrician of the Electric and International Telegraph Company.

To the Chairman and Directors of the Atlantic Telegraph Company.

Nautical Notices.

PARTICULARS OF LIGHTS RECENTLY ESTABLISHED.

(Continued from p. 437.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
54. Skaw	57° 44·1′ N., 10° 37·9′ E.	Kattegat	F.	144	17	Est. 1858. Entrance. Bearing E.b.N. round South to N.E.b.N. strong. In lieu of former.
Samso	55° 46·2′ N., 10° 33·4′ E.	Ditto	R.	118	14	Est. 1858. Entrance. Beyond six miles a fixed light will be seen, and will disappear for 11 seconds, then is seen a strong glare for 14 seconds, followed by another darkness of 11 seconds, followed by the fixed light: these changes occurring every 3 minutes. Under six miles eclipses not complete.
55. Hayley Pt.	Australia	Beacons	..	..	..	Howick Island, Barrier Reef.
56. Lundy Island	Lee Rock	.....	..	..	..	Off Shuter Point, W.N.W., seven cables.
57. Cape Cullera, Spain	39° 12·2′ N., 0° 13·5′ W.	Mediterranean	F.	92	15	Est. 1st Aug., '58.
58. Pt. Cudillero	43° 36·2′ N. 6° 9·1′ W.	Atlantic	F.	94	10	Est. 1st Aug., '58. Harbour light.
59. Schoeven B.	51° 47′ N., 3° 27′ E.	North Sea	..	..	..	Beacon ship.
60. Holyhead	Old Harbour	Ex. of Jetty	..	..	..	Harbour *Red light*.
61. N. Hinder	51° 36·7′ N., 2° 34·4′ E.	North Sea	F.	40	11	Est. 23rd Aug., '58. Floating.
62. Maplin S.	Beacons	.....	..	..	..	Showing measured mile.

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

The Cairnsmore Rock.—*China Coast.*

The following extract of a letter gives an account of a dangerous rock on the coast of China just discovered by the loss of the *Cairnsmore*:—

I left this anchorage on the forenoon of the 4th July, in the schooner ***Halcyon***, and proceeded in search of the rock on which the British ship ***Cairnsmore*** was wrecked. Owing to light southerly airs and calms, did not reach the scene of the disaster until the forenoon of the 7th, when we found the rock, with the remains of the wreck still on it, but below water. The foremast was standing, but drooping forward at an inclination of thirty degrees from the perpendicular. A portion of the mainmast was floating with the foreyard and other spars cut away by wreckers,—whose operations our approach put a stop to *pro tem*,— but still attached by portions of the rigging.

The wreck lays with her head W.b.S.½S. On her forecastle we found nine fathoms of water; on her poop six. The rock, which appears to be a perfect pinnacle, rising out of twelve fathoms, penetrated the ship's bottom amidships and broke her back. It is difficult to say the precise depth of water on the head of the rock, as the wreck quite covers it; but I think at low water spring tides not more than eleven feet will be found, possibly less. The lead, in approaching this dangerous rock, can give no warning whatever, as the rock is very small, apparently not more than thirty or forty feet in diameter, and rises very abruptly. The soundings, as given in the Admiralty charts, are perfectly correct, twelve fathoms being found at the very base of the rock. At present a very perceptible tide ripple marks the position of the rock and wreck, but I doubt whether the ripple will be so strong when the latter is removed.

Should it be deemed advisable to place a buoy on this dangerous rock, the strong tides which rush through the channel must be taken into consideration, and moorings of adequate weight provided.

The following are the bearings of the most conspicuous objects seen from the rock, which lies in lat. 30° 42′ 10″ N., long. 122° 34′ 40″ E., very nearly in mid-channel between the Parker Islands and the Saddle Group:—S.E. point of Racehorse Island, South; a small rugged rock close to the S.E. point of Raffles Island, and in a line with the point, S. 59° W.; the northernmost rock of the group off Chesney Island, very conspicuous, N. 59° W.

It would be prudent for vessels navigating this channel to keep on the Saddle Island side; and when going North, the Bit Rock, South of South Saddle Island, they will be to the northward; and going South, when the same rock opens to the northward of the South Saddle, they will be to the southward of this dangerous rock.

Several fishing-boats were working at the wreck when we first saw it, but left on our approach.

We returned to Shanghai after fixing the position of the rock, which agrees very well with that assigned by the master of the *Caterina*.

Total Loss of the British Ship "Rodney," and the Dutch Barque "Olivier Van Noord."

Ship Sea Park, at sea, June 8th.

Sir,—I beg to send you an account of the loss of the English ship, ***Rodney***, of London, and the Dutch barque ***Olivier Van Noord***, both of which went on

shore on Kenn Reef, lat. 21° 9′ S., long. 155° 48′ E., at 4.30 on the morning of the 7th of June, the particulars of which are as follows.

The British ships *Rodney*, *Sea Park*, and *Northumbrian* left Melbourne together on the 22nd of May, for Torres Straits and India. On the 6th inst. we were joined by the Dutch barque to keep company with us through this dangerous passage. All four ships hoisted their longitude at noon of that day, which corresponded to a mile. The course to be steered during the night was then agreed to by all.

When I went to bed at ten p.m. the *Rodney* was the headmost ship, *Northumbrian* a little on her starboard quarter, *Sea Park* right astern, and the Dutchman astern of us; all went on as usual till 4.30 in the morning, when I was awoke by the ship being brought to the wind. I jumped on deck immediately and saw what I supposed was the *Rodney* firing blue lights and rockets as fast as possible. We all felt certain that something must be the matter, but could see no danger. The Dutchman passed under our stern as we rounded to, continuing the same course. After looking most anxiously to leeward for some minutes with opera glasses, I saw a faint line of broken water not a mile off on our lee beam. Not knowing which way the reef might run, the ship's head was very prudently kept to the South and West until day broke, when the wind freshened very considerably. We then discovered two vessels on the reef,—the Dutchman on her beam ends, with her decks to the sea, which was making a clean breach over her; her position was indeed a most awful one; the other, about a quarter of a mile to the eastward of the Dutchman, proved to be the *Rodney*, which was comparatively in an upright position; but the rollers, which were increasing every moment, and broke upon her weather beam, sending the sea high over her lower yards, lifting her for the time and causing her to lurch again to seaward, showed every instant to be most precious, as there was no knowing how long she might hold together. The *Northumbrian* was hove to about two miles to the S.E. of them, rendering every assistance in her power. The *Sea Park* was immediately put about to go down to them, but the current was so strong that she could not weather the reef, which compelled us to make a tack off before we could get near to them. Our quarter boats were all ready for lowering, being efficiently equipped with grapnels, life-buoys, small lines, &c., the crews sitting in them all ready to lower themselves down by Clifford's patent apparatus. About 8h. a.m. they pulled off, but had not proceeded more than half way when they were met by Capt. Bissett, in one of his own boats, pulling towards us. The utmost anxiety was now depicted on every countenance; but as they neared us he stood up, waved his hand, and said, "All saved!" No one who has not experienced it can know the relief conveyed by those two words.

The instant the danger was perceived on board the *Rodney*, Capt. Bissett ordered blue lights and rockets to be fired without intermission; this precaution on his part was, in all probability, the means of preventing the other two ships meeting with a similar fate to his own; the Dutch barque did not understand what the signals meant and stood on.

The *Rodney's* crew behaved with the greatest order and coolness, great credit being due to Capt. Bissett for the successful manner in which he got his boats lowered and all his men into them, without the slightest accident, in so heavy a surf. The *Northumbrian* lowered her boats immediately upon rounding to, going first to the *Rodney*, where they were hailed by Captain Bissett (who was then getting the last of his own people out of the ship) to go to the Dutchman. By this time the tide had ebbed considerably, the breakers becoming more violent every minute, and the ship commencing to fall over similar to the barque. Having saved their own lives the *Rodney's*

men then went to render ano assistance they could to the other wreck. The *Northumbrian's* large boat succeeded in getting close under the Dutchman's quarter, where all the crew had taken refuge, having lost all their boats in endeavouring to launch them, the others lying off ready in case of an accident, during which the *Rodney's* lifeboat, in charge of Mr. Richmond, chief officer, was thrown right upon the reef by a tremendous roller, capsizing all the crew out of her, bruising some of them very much, and filling her with water. They, however, succeeded in launching her to leeward of the Dutchman, and with great difficulty got alongside and relieved the *Northumbrian's* boat, which was overcrowded, having all the Dutch crew on board of her.

The *Northumbrian* took the Dutch crew on board, the *Sea Park* taking the *Rodney's*. At noon the *Rodney* fell over on her beam ends, similar to the Dutchman, the mainmast, mizenmast, and foretopmast going over the side.

The course steered should have taken us fifteen miles to the eastward of the reef, without allowing for any current, which had set us to the eastward twenty miles per day for the two previous days; it must therefore have changed westward, which, indeed, we experienced so forcibly when standing towards the wrecks.

The reef is laid down on the charts very much smaller than it really is. From the view I had of it from aloft, I consider that it extends from twenty to twenty-five miles from S.W. to N.E., and shoal water to leeward of it about seven miles.

The *Rodney* and *Sea Park* were fitted with Forrest's lifeboats and Clifford's patent lowering apparatus, both of which proved most efficient. The Dutchman, as I have already shown, lost all his boats, and had not other ships been in company all his hands would most assuredly have perished, the sea being alive with sharks.

About a mile to the westward of where these two ships went on shore, we observed the wreck of another large vessel, which had been there apparently some months. The anxious inquirer naturally exclaims, "What ship was it? I wonder if her crew were saved." The probability is they were all lost and the ship never more heard of. What cares the owner? She was most likely insured, and after a certain time the policy paid; but where is the crew who perished in that man's service? The chances are a hundred to one that she had neither lifeboats nor Clifford's patent, on board. Neither would the *Rodney* nor *Sea Park* have had them had they not taken emigrants out from England.

The shipowners of Great Britain are in many instances very charitable, subscribing largely to sailors' homes, chapels, schools, &c., but are very loth to adopt improvements on board their ships, which would often be the means of saving life. Emigrants, troops, and passengers, have some protection, for commissioners are appointed to go on board and see that boats are properly fitted, and plenty of them. Why, I ask, have not sailors the same protection? Is it that their lives are considered of less value than other people's?

It is through the press alone that the public of the present day get their grievances redressed. I hope, then, sir, you will pay a visit to our docks, and see for yourself if my statements are not correct. An article on the subject from your able pen will always carry much further weight with it than anything that could be written by

A SAILOR.

To the Editor of the Times.

The Treaty with China.

We have received from a reliable source the following summary of the most important points of the Treaty which was signed at Tien-tsin on the 26th ult. by his Excellency the Earl of Elgin and the Imperial Commissioners Kweiliang and Hwa Shana, and which has since received the ratification of the Emperor. The treaty contains 56 articles:—

Art. 1.—Confirms the treaty of peace at Nankin, and abrogates the supplementary treaty and general regulations.

2.—Provides for the optional appointment of Chinese and British Ministers at the courts of Pekin and St. James.

3.—Contains provisions with respect to the permanent establishment of the British Minister at Pekin, his family and suite.

4.—Makes provision for the travelling, postal, and other arrangements of the Resident Minister.

5.—The British Minister to transact business with the Secretary of State on footing of equality.

6.—The same privileges accorded to Chinese Minister in London.

7.—Provision with reference to Consuls and their official rank.

8.—Christianity, whether Protestant or Roman Catholic, to be tolerated, and its professors protected throughout the empire.

9.—British subjects to be permitted to travel for pleasure or trade to all parts of the interior; arrangements with respect to passports, and cities in the hands of rebels.

10.—Chinkiang to be open to trade within a year from the signing of the Treaty, and three other ports on the Yang-tze-kiang as far as Haukow to be opened, on the evacuation of its shores by the rebels.

11.—The ports of Ninchwang (Manchooria), Tang-chow (gulf of Pecheli), Taiwan (Formosa), Swatow, and Kiung-chow (Hainan), to be opened in addition to present ports.

26.—Tariff to be revised by an Anglo-Chinese Commission appointed for the purpose.

27.—Revision of tariff to be decennial.

28.—An official declaration of the amount of transit duties leviable at inland custom-houses to be published in English and Chinese. The British merchant, however, to be allowed if he chooses to commute the transit dues at an *ad valorem* rate.

29.—Reduction of tonnage dues, and a four months' certificate to vessels engaged in coasting trade.

50.—Official correspondence to be for the future conducted in English on the part of English officials—to be accompanied by a Chinese version for the present—and to be considered the text.

51.—The character I (barbarian) to be suppressed in Chinese official documents.

52.—British ships of war to visit any port in the empire. The commanders to be treated on terms of equality by Chinese officials.

53.—Measures to be concerted for the suppression of piracy.

54.—Favoured nation clause.

55.—Conditions affecting the Canton indemnity question, to be placed in a separate article.

56.—Ratifications are to be exchanged within a year.

North China Herald.

Sayings and Doings.

The first of the new large stone docks which the former Board of Admiralty determined on building at Chatham is now completed, having occupied about three years in its formation. It is nearly 400 feet in length, 93 feet in width, and 40 feet deep. The foundations are laid on beds of concrete, several feet deep, and the dock is built entirely of the best Scotch granite, of which several million cubic feet have been used. The new basin will be opened in the course of a few days.

A full court of the Elder Brethren of the Trinity House has elected Rear-Admiral R. Gordon Deputy Master, in the room of Captain Shepherd, resigned. Captain Shepherd, who succeeded Sir John Pelly in June, 1852, will continue one of the Elder Brethren.

It is said that the French, anticipating the project of Admiral Sartorius, are building an iron vessel, termed a steam ram, propelled by screws, that is to destroy any ship that swims by merely running *into* her. The Admiral considers that 2,500 tons would be quite large enough, while she would be shot proof and would be armed with heavy guns. All wooden ships would of course fall before her and disappear at her bidding, and she would by her velocity, to be obtained by steam and form, overhaul the fastest sailers. There is something in connecting weight to give effect to her blow along with speed to enable her to overtake a ship like "saying and doing."

Prince Alfred underwent a special examination before the Rev. T. Main, Professor at the Royal Naval College, Portsmouth, in the presence of Admiral Sir G. Seymour, K.C.B., Rear-Admiral the Hon. G. Grey, and Captain R. S. Hewlett, of H.M.S. *Excellent*, Captain-Superintendent of the Royal Naval College. The examination lasted during Friday, Saturday, Monday, and the morning of Tuesday, and comprised the subjects of arithmetic, algebra, plane trigonometry, Euclid, sacred history, and history of England, geography, Latin, French, German, and English dictation. His Royal Highness having been declared to have passed satisfactorily in all these several branches, has been appointed a naval cadet, and joined H.M.S. *Euryalus*, Captain J. W. Tarleton, C.B., on Tuesday, 31st August. After a leave of absence for two months, his Royal Highness will rejoin the frigate for permanent service, and will mess and live with the midshipmen on board. Her Majesty has been pleased to appoint Lieutenant Cowell, R.E., governor to the prince, who will accompany him in his voyage.

The slave brig captured by the U.S. man-of-war *Dolphin* arrived at Charleston on the 27th August, in charge of a prize crew. Her name is believed to be the *Echo*, and she hails from Baltimore. She had a crew of twenty men,—half American and half Spaniards. The slaves were 327 in number, the number when they left Africa having been 470, showing a loss during the voyage of forty days, of 143. The filth and stench of the vessel are represented as being perfectly horrible. Shortly after the *Echo's* arrival the Africans were landed and placed in charge of the United States' Marshal. The government had ordered the steam-frigate *Niagara* to convey them back to Africa.

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

NOVEMBER, 1858.

OBSERVATIONS ON TAÏ-WAN OR FORMOZA.—*By Commander G. A. C. Brooker, of H.M.S. "Inflexible," in June,* 1858. *Communicated by the Hydrographer.*

We left Amoy on the 7th of June, 1858, steering for the Pescadore Islands, through which we passed the next day, and arrived off the low land of Taï-wan at 4h. p.m. Port Kok-si-kon is very difficult to make unless Ape Hill can be seen, as there is no guide but a very few detached huts, which appear to be in the water, the sandy beach on which they are built being so low. We obtained the assistance of a fisherman, who pointed out the place off which we anchored about a mile and three quarters, in 5½ fathoms. It is a miserable looking place, consisting of a few wretchedly made huts, inhabited by some poor Chinese, who obtain a livelihood by fishing, when the weather permits. Kok-si-kon *was* the entrance into an inner basin, where junks anchor with safety, and receive the produce of the interior, which is brought down on rafts. Since Mr. Richards, Master of the *Saracen*, surveyed this place, the entrance has been quite blocked up by the constant outpouring of sand from inside, which forming outside causes a heavy surf to break right across the entrance. I had some difficulty in landing, and only found 5 feet where was formerly 2½ to 3 fathoms. The junks now use a passage four miles to the South of Kok-si-kon. If one place fills up, another becomes open, from the ever changing state of the sand.

There is a shoal about a mile off shore between Kok-si-kon and

Fort Zelandia. I believe it is marked on some old chart of Tai-wan, and called the Beloy Shoal. We could only see the water breaking somewhat heavily over it from the mast-head, a strong breeze blowing at the time. It cannot be seen, or rather the sea does not break over it in calm weather. By cross bearings from the North and South sides of it, we placed the shoal in lat. 23° 2′ N., long. 120° 6′ E., bearings from Joss Islet tree clump, N.E.b.E. ½ E.; Fort Zelandia, E.b.S. ¾ S. The shoal is about three quarters of a mile in circumference. We had no opportunity of sounding on it, but I should think there was not more than 10 to 12 feet of water on it. Vessels coming from the northward, bound to Ape Hill, should not approach the shore within three miles, or get into less water than 4½ to 5 fathoms until Fort Zelandia bears East, which will place her well to the southward of the shoal.

On the 10th of June we anchored two and a half miles off the old Dutch fort of Zelandia, which is the best object for knowing one's position when the weather is clear, excepting Ape Hill.

The city of Tai-wan is situated about three miles inland from Fort Zelandia, and can only be approached from the sea by means of a canal, which is very narrow, and we found it nearly blocked up by rafts laden with merchandise. This seems the only means they possess of transporting the goods to the junks. We found a passage in from the sea to the canal between two distinct lines of breakers, being guided in by a fisherman, who willingly pointed out the way. The passage is only used by small boats in fine weather.

We met with every civility from the Mandarins of the city, who promised to assist in prosecuting a search for missing Europeans, although they did not believe any were in that part of the island under Chinese control, as they would have knowledge of it.

Tai-wan is a finer and cleaner city than the generality of those in China. The streets are moderately broad and nicely paved with tiles. Everything has an appearance of cleanliness, a rare quality to be found in Chinese towns. The shops were well filled with the manufactures of China, that are obtained from Amoy in exchange for rice and sugar, which is the principal produce of the island. We found provisions enormously dear, owing to the scarcity of rice; last year's crops were in many places of the island a failure.

We remained a day at Saracen's Head to get correct errors of our chronometers, as that place is fixed by repeated observations made by Mr. Richards. From Ape Hill we continued along the South coast, which gradually becomes hilly, and may be approached with safety to two or three miles. We did not find the coast line as given in the general chart of Formoza to be at all out in this part. At Pong-li we anchored three quarters of a mile off shore. The surf was too heavy for our boats to land; but having obtained a catamaran we landed without difficulty. A walk of five miles, through a country richly cultivated, brought us to the residence of a Chinaman, from whom I had been led to expect important information could be gained respecting the fate of Europeans long missing. With this Bancheong,

who was the Chinaman spoken of, I had a long interview; but all the information that could be obtained from him merely corroborated that which was previously known of shipwrecked foreigners.

To give an idea of the sort of Government that was or is exercised in the island of Formoza, the same Chinaman had under his authority upwards of 5,000 Chinamen, ostensibly to till the land, of which he possesses large tracts in the neighbourhood of the hills, where he resides; but these men are often used to repel the attacks made on him by the official powers of the island, to extort (as he says) large sums of money, because he has a goodly property. More than once the Mandarins have retreated before the formidable show which he has made; so that when we saw him he was living at the foot of the hills, surrounded by his clan, and to all intents and purposes outlawed. From him, as well as from the Mandarins at Tai-wan, I heard the same account of the Aborigines of the island,—of their excessive ferocity and murderous propensities. They inhabit the eastern side, and towards the South Cape, are held in great dread by the Chinese, who scarcely or never venture near the high mountains.

From Pong-li we continued South about eighteen miles, and anchored in the bay of Liang-kiow, in lat. 22° 4′ N., long. 120° 42′ E. It is not known that this bay affords excellent shelter in the N.E. monsoon, good holding ground in 7 and 6 fathoms. The bay is two miles broad and nearly the same in depth. It requires no directions for entering it, as there are no dangers on either side,—a mid course in, and being guided by soundings. Vessels would be glad to run here in a N.E. gale; it affords no protection from any other quarter. During our stay in the bay, of one night, the breeze was strong from the S.W. A sailing ship would have had to stand out to sea. A heavy surf was on the beach, which rendered our landing difficult. There are two villages in the bay, nearly all fishermen. It is here that occasionally the Aborigines come down from their mountain holds, tear up the dead from their graves to extort heavy ransoms from the living relatives.

A few miles South of Liang-kiow several wrecks have been reported to have taken place; but only one is known for certain, which occurred in 1848 or 1849, when all the crew were murdered by the aborigines except three, who were rescued from these savages by the Chinese, and they eventually got back to China.

From Liang-kiow we continued South, rounding the South Cape at some distance, as the weather was hazy and had every appearance of a storm; indeed the barometer fell considerably, and we made all the necessary preparations for a typhoon. To examine an island like Formosa, it should be done when the N.E. monsoon is steady and certain. The western coast is always unsafe in the S.W. monsoon, and if the wind blows with any strength from that quarter, it is impossible to land. The surf is very heavy; even the Chinese fishermen, who use a sort of catamaran made of bamboos, do not venture out when the wind blows strong from the S.W.

The eastern side of the island, from South Cape to Soo-au Bay, is

one unbroken chain of mountains, some of which rise, as it were, abruptly out of the sea to the height of 8,000 feet. At times we were within half a mile of this beautiful looking country. No soundings could be obtained with 100 fathoms. It has been supposed that there were harbours or rivers on the East coast; but nothing of the sort exists. In several places where the densely wooded mountains receded a little, there was an appearance of the bed of a river, which is attributable to the mountain torrents finding their way down to the sea. These places have been marked in the chart as rivers, which would have that appearance after much rain. No sign of a habitation could be seen, and it was by the glimmering of lights, which we saw at night, about one third up the mountains, that we knew they were inhabited.

On the 17th of June we were steaming along the land, as close in as was prudent to go, sounding every half hour, without obtaining any bottom with 60, 80, and 110 fathoms, when in one of the small sandy bays, some people and huts were seen. I pulled towards the shore in the gig, having with me our Chinese interpreter. A heavy surf was breaking on the beach, rendering our landing out of the question without destroying the boat. The people that we saw on shore were a group of aborigines and Chinese, about eleven or twelve of the former and twenty to twenty-five of the latter. To describe the frantic manner in which the aborigines tore along the beach, brandishing their long shining spears, and waving their bowie-like knives, would be impossible. So eager were they to attack us that twice these savages made an attempt to rush through the surf, which, however, was too heavy for them. They then prepared a boat which could stand the surf, and were launching it to come out to us; but now the Chinese interfered and would not allow them to proceed. We hailed them to let the aborigines come on, as we were quite prepared, although no firearms had been shown above the gunwale of the boat. The Chinese were as anxious that we should go away as they were in preventing the savages from launching the boat; for they said if one of the Tche-whan (raw savages) were killed, whole tribes would descend from the mountains and murder all the Chinese. The savages would not hear of conciliation; money and presents were offered them, but nothing would satisfy their savage nature but our lives, to which we strongly objected; and when at last we produced our carbines and a shot was fired over their heads, their eagerness to be at us became considerably less: the shot had the desired object of causing the savages to retire one hundred yards to the rear, whereupon the Chinese, without any hesitation, launched the boat, and came out to us. The Chinese who were among those savages wore the appearance of those we see elsewhere. They spoke with the interpreter at a distance, but appeared to use signs and gestures as well as words in communicating with the aborigines. They have probably been banished from China, and earn their safety by services which their superior intelligence enables them to perform. We learnt that the neighbouring mountains hold about 4,000 aborigines, who live

on potatoes, which they grow on the sides of the hills. They sometimes shoot wild animals with the bow and arrow. These savages had not that weapon with them now.

I sent the boat back with some proclamations offering rewards for missing Europeans; these were explained to the savages, and again presents were offered them; but they broke out into fearful gestures, and threatened to murder the Chinese if we did not go away. We were quite close enough to the beach to observe that the savages are tall and well made, a caste of countenance totally different to the Chinese, it has more of the Malay, by no means prepossessing, and their long loose straight black hair, flying over their shoulders, adds to their naturally wild and ferocious appearance. Their complexion is nearly as light as the Chinese, they were quite naked except a small cloth round the loins, which also served to secure the ugly looking knife which each wore. Our interview with this peculiarly savage race of human beings is quite enough to convince one that any European falling into their hands would be instantly murdered. It would be highly injudicious for a sailing ship to approach near to the eastern side of the island, for if caught in a calm, the swell from the Pacific would set her on shore. The aborigines said they had never seen a ship so close to their shores before, (three quarters of a mile,) and this, the Chinese told us, was the reason why they were so exasperated. They called the place Chock-e-day. We placed it in lat. 24° 6′ N., long. 121° 43′ E.

We continued our course to the northward, keeping close in shore, but we did not see any more of the savage tribes. Forty miles North of Chock-e-day is a place marked on the chart, Soo-au Bay, where the dominion of the aborigines ceases; for we saw several Chinese fishing-boats, some of which came alongside without any hesitation. From them we learnt there was a good anchorage in the bay. Our anticipations were more than realized, for Soo-au Bay is a first rate harbour, affords a good and safe anchorage, being well protected in both monsoons. Fifteen to twenty ships of heavy burthen could easily anchor here. I consider it the only good harbour Formoza possesses. We remained there nearly two days, and while I was away exploring some hills inland, a careful survey was made by the assistant surveyor lent from the *Actæon* for this service. The harbour is easy of access, and may be entered without fear, the water gradually shoaling to 5 fathoms within two and a half cables of the shore. In the centre of the bay is a conspicuous groups of rocks, all above water, with 3 fathoms close to. They should not be approached within a hundred yards. A good anchorage lies between them and Soo-au Village at the head of the bay, where fresh water can easily be procured from a stream which runs through that village. There are also two other good anchorages in the bay off the villages of Pak-hong-o and Lain-hong-o.

Soo-au Bay is quite a mile in width, and a mile and one third in depth; is in lat. 24° 33′ N., long. 121° 53′ E. High water at full and change about ten hours; rise and fall about three feet. Coming

from the North the bay or harbour can readily be found by sighting Steep Island, which is easily recognized by its peculiar shape, giving rise to its name. The Soo-au Rocks bear from this island S.b.W., thirteen miles. Ships should not pass between the North Cape of the bay and Soo-au Rocks, as there is a reef of sunken rocks, which appear to extend nearly out to them. The highest of the Soo-au Rocks is 150 feet, and may be rounded close to.

The place offers an opening for commerce; rice is the only article grown in large quantities; a little tobacco is cultivated, which the Chinese consume themselves. We ascended hills of 1,700 feet, from which we obtained good views of the country. In the rear were the high mountains, inhabited by the aborigines, of whom the Chinese were in great dread. The Chinese have organised a sort of militia for the protection of the wood cutters, who generally penetrate the woods in bodies of 150 to 200. The militia are in advance, and if any of the savages are seen, an instant retreat takes place. The wood which they cut is only used for building their huts and for firewood.

As foreigners had never been seen before, we were naturally objects of great curiosity, and as a matter of course the ship was surrounded with boats. Living among the Chinese is a race of aborigines, called Sick-whan (domesticated savage). Those that we saw were principally women, who live and dress the same as the Chinese, although they speak their own language, which is quite distinct from the Chinese; it sounds something like the Malay, and one would suppose these people sprung from that race. When asked if they knew of their origin, they had not the slighest idea, only they knew they had no Chinese blood in their veins. In appearance they are as different to the Chinese as their language is in sound. The eyes are placed like Europeans, and generally clear, dark, and intelligent; small mouth, with white teeth; the nose is slightly flattened; complexion of the Malay kind, but of a lighter tint or shade; the hair of jet black is worn straight down over the shoulders and kept back from the forehead by a band of red cotton, which has a pleasing effect. Dress is an article that does not trouble them much, a short petticoat comprising the whole, developing an upright and well formed figure. They live in huts similar to those used by the Chinese, very dirty and full of vermin. These interesting people have as much dread of their relatives, the "raw savages," as the Chinese have. Some of the Sick-whan people came on board, and it would be impossible to describe their astonishment when they saw the machinery and the large guns.

Ten or twelve miles North of Soo-au we saw a river running through a large plain. We anchored off the entrance in 9 fathoms, about a mile off shore. We had some difficulty in getting the gig over the bar, there being only three feet; and in coming out we were nearly swamped, the surf being so heavy. Once inside, the river is very smooth, and we carried 9 to 12 feet for some distance. We explored this river, which is called Kaleewan, as far as the boat would go, never getting less than 6 feet of water. There are two other branches

which water the large plain through which it runs. The branch we took was very winding and exceedingly pretty: the banks on either side are highly cultivated. In some places the river was not more than sixty yards wide, at others one hundred and fifty yards. We passed through several villages, some of which are inhabited by the Sick-whan tribes. We received every civility from them, and no small amount of curiosity was shown, as white people had never been seen before. The aborigines never come near them, although they were spoken of with horror. We were invited to enter their huts and smoke, which they appear to practice to a great extent. They all seemed very anxious to know if we had "brought any thing to sell," and would doubtless be very willing to open a trade with foreigners if it were practicable; the main obstacle would be the bar at the mouth of the river; the flat bottom boats of the country can only get in. Wheat, rice, and sugar, are grown in considerable quantities. I obtained this intelligence from a village containing upwards of 1,000 Chinese, and although they had no Mandarin to keep order, everything seemed well conducted.

From this river we continued on to Ki-lung, a very good survey of which has recently been made by Lieut. Preble of the U.S. Navy. As we remained there several days, the assistant surveyor was employed making one as well. On visiting the coal mines, which are about four miles South of Ki-lung, in an exposed bay, I penetrated into one of them, which runs horizontally into the hill. The Chinese had worked in about 250 yards, and were still advancing. The entrance is sixty feet above the level of the sea, and two hundred from the top of the hill. The strata of coal lies between soft sand stone, and its average thickness three feet. The coal is conveyed to the mouth of the mine by means of small buckets, drawn on a flat piece of wood, which acts as a truck. From the constant passage of the buckets the narrow floor of the mine has become quite smooth, rendering the transport of coal easy. In some places there is a little water collected, which oozes through the crevices overhead. The strata takes a direct line or at right angles to the face of the hill. In several places the Chinese had worked to the right and left, but to no great distance. They have twelve or thirteen of these small mines,—if they can be called such,—each is worked by six or seven Chinamen, night and day, and each produces daily twenty to thirty piculs, (seventeen piculs go to a ton,) a small quantity, but the labour is very heavy. I asked them why they did not work the mines broader and have regular trucks with small wheels. They said it would be too expensive, and they were afraid of the top and sides falling in. I have no doubt if the demand for coal was greater the Chinese would furnish the supply equal to it. They use long pointed hammers to break the coal out. We had no difficulty in obtaining one hundred tons, which a Chinaman supplied in two days at the rate of twenty-four dollars per one hundred piculs, or about four dollars a ton. We carefully tested this coal with Welsh, and for keeping

steam it is superior to the Welsh, but the enormous expenditure is the great objection to its use for steaming purposes.

It has long been supposed by the foreign community residing at the different ports in China, that Europeans were detained in slavery in sulphur mines in the northern part of Formoza, and this prevailing report, (which on investigation has arisen without any foundation,) has been reported to the Foreign Office with so much seeming truth, that a man-of-war was ordered to search the island, and if possible obtain a clue to the mystery which has been hanging over so many missing Europeans. Our search up to this point had been fruitless, and as so much faith had been put in the statemests relative to the sulphur mines, I was determined to clear up that part of the mystery by exploring the northern part of the island and visiting these sulphur mines.

Having provided ourselves with a guide, and Chinese Coolies to carry our provisions, I started with an officer and ten marines, besides an English and Chinese interpreter, and also a botanist, the latter having been with us during our cruize round the island, and has made an interesting collection of plants. Our road led through a beautiful country, very hilly, and richly cultivated with rice. At the different villages where we stopped inquiries were made respecting foreigners. We were the first they had ever seen. Early on the second day of our journey, which had become laborious walking, having to ascend hills of a thousand and eighteen hundred feet by a very indifferent road, we arrived at the sulphur mines. We knew of their proximity by the strong smell of sulphur and the noise of the steam issuing from the mines. We found them situated in an uneven space of ground, about half way up some high hills, which were thickly covered with long coarse grass. These mines consist of several gorges of eighty to a hundred feet deep, and occupy a space of a mile in circumference. We went to the bottom, at the risk of being suffocated, for the steam was issuing from many places in the earth with considerable violence. We found the sulphur lying about quite pure; large quantities could easily be obtained; but situated as the mines are, in so hilly a country, with very bad roads leading to them, would render the transport difficult and expensive. The mines had not been worked lately, by order of the Mandarins, who sent soldiers and burnt down the straw huts that were erected near. We were very particular in searching every hut within four or five miles for any relics of foreigners; but nothing of any sort could be found. An old man and his wife, who had lived close to the mines all their lives, were closely questioned. Their answers were given with no hesitation, and I have no reason to doubt the truth of them. The tempting rewards which I offered them would, as they said, make them comfortable for the remainder of their lives, and they would be too glad if they knew of anything about foreigners; we were the first they had ever seen here. As for the aborigines, they had heard of such people being very savage, but they never came so far North.

These were the only mines we could discover on the island, and the only ones spoken of by Chinamen when questioned on the subject. We returned to the ship by a different route. After leaving the sulphur mines we had to ascend a hill of 1,000 feet; a road has been formed by placing some rough stones down in various places; the ascent was almost perpendicular. Our exertions were amply rewarded by the sight that burst upon our view on reaching the top. I never beheld a more beautiful piece of scenery. We were looking down on a vast plain, laid out like a garden, so richly cultivated was it. The rivers of Tamsui and Manka meandering through the plain as far as the eye could see. Clusters of dark green trees were scattered here and there over this bowling green like plain, interspersed with neat looking houses. To the right and left were undulating hills, all in a high state of cultivation. Not far from us was the Tamsui Hill of 2,800 feet. The background was made complete by the immense mountains of the interior, rising up to the height of 12,000 feet. We stood gazing at this magnificent view until the lengthened shadows of the neighbouring hills warned us to be on our way, having good ten miles to walk before we could reach the Tamsui River, where we procured boats and went up the river, the source of which is within a few miles of Ki-lung. We communicated with numerous villages in our way back, but no information of any description could be gained of shipwrecked foreigners.

We got back to the ship in the evening of the third day, rather fatigued and foot sore. In our interesting journey we met with every civility from the Chinese; and indeed in our whole cruize the Chinese always evinced a cordial good feeling towards us; and I cannot but think that if Europeans have fallen into their hands,—we only know of one case,—they would be restored to China without delay; but if they have unhappily fallen into the hands of the aborigines, their fates were soon sealed.

From Ki-lung we went round to Tam-sui, off which we anchored for a few hours only, a strong S.W. wind rendering the anchorage unsafe. There is an ugly bar at the mouth of the river, and only fit for vessels of 11 or 12 feet of water. The Chinese told us there was a passage in of 3½ fathoms, which would be impossible for a stranger to know, as the sands constantly shift. We coasted along the western side as close in as the low land would admit. The unsettled state of the weather prevented our making any definite remarks of the coast. It is very low, and should be approached with great caution, the lead kept constantly going.

After communicating again with the authorities at Tai-wan we returned to Amoy, calling at Makung of the Pescadore Islands on the way, having been nearly four weeks employed in this interesting service.

A Visit to Luzon and Alabat,—*Philippine Islands. By William M'Donald, Commander of the "Samarang."*

Whampoa, September, 1856.

Sir,—I have no excuse to offer for troubling you with the following notes, further than a hope, that should you deem them worthy of publication in your valuable periodical, they may prove of service to others who may have occasion to go on the coast they treat of.

Being in Whampoa in May, 1856, I chartered this ship to a party in Canton to proceed to Manbon, a port on the East side of Luzon, and there load a cargo of timber for Hong Kong or Whampoa. At the same time I was informed by the charterers that very little was known of the place, that no large vessel had ever been there, and no British vessel of any kind.

On overhauling Horsburgh I found that he had little to say about that coast, further than a warning to give it a wide berth. I consulted several friends in both services, (H.M. and Merchant,) and they concurred with me in thinking that little or nothing was known about the place.

Sailed from Hong Kong on June 4th, and had very unsettled weather, variable winds, and low barometer, until the 9th, when we sighted the North end of Luzon, at 6h. a.m. It was then blowing a hard gale from S.S.W.; but as soon as we got under the lee of Cape Banqui, the weather moderated and continued so.* Kept as close as close as possible to the Luzon shore, to avoid being carried to the northward by the strong current which runs along both sides of Luzon, meets amongst the Bashees, and goes with increased velocity along the East side of Formoza. In Horsburgh's chart all the land at this end of Luzon is laid down five miles too far North, but on looking at the Directory I find the positions correct by my observations. This a fault I have frequently noticed in those seas. Charts called Horsburgh's differing as much as ten miles in some instances from his Directory.† This is hardly fair play to the memory of that very superior and indefatigable man.

June 16th, at 6h. a.m. passed Cape Engano within a mile, and immediately on opening the land experienced the northerly current in all its glory. Stood on the starboard tack for a hundred and forty miles, with the wind strong at South, and worked to the southward between that and forty miles from the land. The current decreased the farther we stood to the eastward. One day stood close in shore to see if the current would not be less close to the land; but I repented it, as it was running with great force. Tacked within a mile of the beach, and for the next two hours lost six miles of ground. Warned by that I kept well to the eastward until June 19th, when we sighted the

* On arrival at Hong Kong I found that there had been a heavy typhoon in the sea at that date, on the S.E. quadrant of which we must have been.

† For instance, the St. Esprit Island in the lower part of the China Sea.

Island Pollilo. Winds light and northerly. Stood on for the channel between Pollilo and Cape Ildefonso, which is the safest passage, being clear of all dangers.

A reef about three miles extends from the North end of the island, which is easily avoided. The southern passage appears to be the clearest; but the natives of Manbon informed me afterwards that it is full of reefs, and very dangerous.

June 20th.—Anchored in the bay to the S.W. of Cape Inaquican. It has no name on the charts, but it is a good anchorage, and the soundings run regular for two miles off from 1 to 20 fathoms.

21st., 4h. a.m., up anchor and stood to the South along the shore, between Cabalete and the main land. Obtained very good observations, and found the coast very badly delineated both in Horsburgh's and Spanish charts. All along the Luzon shore, from our last evening's anchorage, there are no soundings under 80 fathoms a mile off shore.

At sundown, and just as I was getting anxious at the prospect of passing the night under canvas in that narrow channel, descried a church in a snug looking bay, which we concluded to be Manbon. The wind coming dead off shore, obliged us to beat for it.

At 8h. p.m. after firing some guns and burning blue lights, succeeded in getting the Commandante off, who persuaded me to anchor for the night, which I did, with the stream anchor in 32 fathoms mud. The Commandante, (Don Francisco Roderiguez, who was also my consignee,) informed me that with daylight we could safely stand in by the lead.

21st.—At 4h. a.m., up anchor, and worked into 4 fathoms, low water, within three quarters of a mile of the Pueblo, and anchored with second bower and twenty fathoms of cable. The soundings are very regular within the bay. The only danger is the coral reef on the North side, which is easily avoided. This day was Sunday, and as the natives are all Catholics, a holiday. But it was doubly a holiday with them which will not be forgotten for years. The whole population of the town, old and young, and people from miles inland, came to see *la fragata Ynglesa* (I hope my Spanish is correct). The decks were crowded the whole day, and the ship surrounded with canoes and boats of all kinds.

At the invitation of the Commandante, I went on shore, accompanied by my wife, to spend the day with his family. On landing, the beach was crowded with the inhabitants of the town, dressed in the gaudiest colours imaginable, who gave us a hearty welcome, both in words and smiles. The women were particularly interested in seeing an English Señora in her country costume, which few of them had ever seen before. They all seemed to vie with each other in showing attentions, handing her flowers, and even kissing her hand. What a striking contrast was such a welcome to the churlish bearing of the Chinese at Whampoa who have a rooted antipathy to all European females.

The natives of this place are a very quiet, well disposed class of people and crime is little known among them. However, Manila being so well known, I need not describe the natives of this place, as they are all the same race. Although the population of Manbon is about 5,000, months pass away without a single soul being put in prison. There is very little trade here, and what there is is principally in cocoa and nepa, two intoxicating preparatians from the cocoanut and nepa trees. Manbon and the adjacent country are very healthy, high ranges of hills surrounding it on all the inland sides, and no unhealthy exhalations from the low land. I saw the corpse of a woman who had died at the age of 108 years, and was informed that there were many in the adjacent country much older. With all due deference to the Spanish Government, it is a pity such a fine island should be in their hands. Were it in the hands of a more energetic nation,—say British or American,—it would in a few years be one of the richest islands in the eastern seas, and without the unhealthy qualities of nearly all the others.

At Manbon it is high-water at seven o'clock, full and change; rise and fall, nine feet. Flood sets South and ebb North. During our stay, had rain towards the close of every day, and much thunder and lightning in the evening. Winds light and variable, and principally from the westward. Average of the thermometer in all July 80°; barometer and aneroid 29·92.

In my letter of instructions from the charterers, a port was mentioned in the island of Alabat, for which it would be advisable to run in the event of bad weather being anticipated. Manbon affording no shelter from the N.E., I was desirous of seeing it as soon as possible after arrival, to make myself acquainted with it in case of requiring to use it. A few days after arrival at Manbon, I started in the cutter for that port. It bears from Manbon E.¼S., thirteen miles. The entrance is rather difficult, being well guarded by coral reefs, but they form the breakwater for the harbour. It is a most beautiful little harbour, and sheltered from every wind that blows. Six large vessels could lie in comfort within it, moored of course. Spars of all kinds, water, and stock (fowls, ducks, and pigs), are to be procured *ad libitum*. Were the facilities of this place more generally known, I am persuaded that many vessels which get dismasted in typhoons whilst coming or going by the Eastern Passage, would put in there and refit, instead of endeavouring to fetch the Chinese ports under jury masts. One thing is certain, it would cost less time and less money,—of course assuming that the hull is not damaged. Labour in abundance at a real per day.

It is a splendid island for timber for shipbuilding purposes. In walking through the jungle I was surprised at the number of gigantic trees. Could permission be obtained from the Spanish Government, or a lease be procured, I am satisfied it would be a mine of wealth to the lessee, and perhaps ere long the name may be as familiar as Moulmein. Malavie is the principal kind, which is not unlike oak, rather

heavier and easier worked, the grain being more regular. The facilities for shipbuilding are also great, a rise and fall of nine feet and a very steep beach, say an angle of 35° or 40°.

We remained at Manbon until August 2nd, loading the ship with a cargo, which consisted of part of the timbers, keel, and planking of a large ship which the Governor of the province and Don Francisco had commenced to build on their own account, but which the Government seized, after all the timbers were cut and shaped, on account of some irregularity. I took away the largest half, and a troublesome cargo it was to stow.

August 2nd, at 6h. a.m., up anchor and started for Hong Kong, accompanied by the *elite* of the place, an excellent brass band, and two gunboats for some miles. After exchanging salutes and three cheers, they left us, and, I make no doubt, with many a heartfelt prayer for our success and safety.

The only Europeans in Manbon are the two Commandants (their respective duties I do not know) and the Padre, who are natives of Old Castile. The two former are married to native half caste ladies, but they all seem to enter into the Indian customs, both in dress and habits. They are, without exception, the most single minded, hospitoble people I ever met with, and we all left them with regret.

Stood up towards Pollilo; wind very light, and continued so for some days.

8th.—Cape Engano in sight, but it is like the cup of Tantalus, no immediate probability of reaching it, as it is dead calm. I find no current now.

27th.—Arrived in Hong Kong, after a tedious passage and a look into the S.E. quadrant of a typhoon.

I am, &c.,

WM. MCDONALD,
Commander of Samarang.

To the Editor of the Nautical Magazine.

DESCRIPTION OF THE AMUR RIVER, WITH PARTICULAR CONSIDERATIONS HYDROGRAPHICAL AND ETHNOGRAPHICAL,—*By Peschtschuroff.*

The Russian Marine Department, which had previously limited its hydrographical researches to the Sea of Ochotsk and Kamschatka, began to extend them, in the year 1847, to the southern part of the Sea of Ochotsk and the mouth of the Amur. Mr. Poplonski, captain in the navy, and Mr. Savin, lieutenant of the corps of pilots, on board the brig *Ochotsk*, described the coast South off Schantar; and the Pilot-Lieutenant Orloff, being in the service of the Russian American Company, continued these researches further eastward on board a

baidare. The brig *Grand Duke Konstantin*, of the Russian American Company, under the command of Mr. Gavriloff, Pilot-Sub-Lieutenant, was the first to investigate the northern part of the Tartarian Gulf. In the year 1849, Captain (now Rear-Admiral) Newelski, on board the transport-ship *Baikal*, investigated the Liman [? estuary] and the mouth of the Amur more closely; and in the following years these researches in the Liman of the Amur were extended both to the North and South, and the Schilka and the Amur itself were examined. The former of these two rivers was explored in 1851 by Captain-Lieutenant (now Rear-Admiral) Kazakewitsch; and of the Amur, into which the steamer *Vostok*, under Captain-Lieutenant Rimski Korsakoff, entered first, Lieutenant Popoff, of the corps of the Topographers, undertook the first topographical survey or examination.

The Amur, the most splendid of the rivers of north-eastern Asia, had already in olden times excited the attention of the conquerors of Siberia. It was the high road for the small detachment of bold Kossacks—companions or followers of Chabaroff—to the eastern frontiers of Asiatic-Russia, where their bold spirits were in hopes of discovering new ways to the enrichment of their beloved country, The first news of the existence of Kamschatka came from these daring men, who embarked on the Sea of Ochotsk with a heroism rarely if ever excelled. Two hundred years later, a handful of Kossacks, beleaguered in Albasin, defended themselves against a Chinese army of nearly 100,000 men, who would not have taken the fortress but for the help of the Jesuit missionaries then residing in Peking. Such expeditions on this large road ceased with the fall of Albasin, the square ramparts of which bear evidence of the encounter of arms to this day. This little band of heroes was brought to the residence of the Celestial Emperor, and there made, in deference to their valour, the Lifeguard of the Body Clan—an honour which has passed to their descendants, who exist still as a small family of Albasinians.

In the year 1854, a powerful expedition for strengthening our [*i.e.* Russian] colonies in the East became necessary. This expedition, under Adjutant-General Muraivieff, went down the Amur, and arrived at its mouth in the middle of the month of July. The failure of the attack by the allied squadrons in the harbour of Petropawlowsk, and of the further defeats of our enemies on the Eastern Ocean, bear witness of the benefit we have derived from the Amur. The immediate result of this expedition was the publication of the first map of the Amur by Lieutenant Popoff. Rapid motion, together with insufficient means, did not permit him to take a proper instrumental survey in order to ascertain the astronomical position of the most important points; but the information collected and very well arranged by him will long remain valuable as an authority upon the maps of this river.

After the return of Count Poutiatine from Japan in the year 1855, the screw steamer *Nadeschda*, of eight horse power, was, with a barque in its wake, placed at the expedition's disposal, and undertook the first voyage up the Amur. This vessel left the port Marunsk on

the 4th July, 1855. On 4th September the steamer was left 400 versts* from Usl-Strelotschnaja, and reached on the 18th that place with the barque, which was tracked along the banks. During this long voyage, a few supplementary notices to Popoff's map were collected, by means of two of Dent's chronometers, one sextant, an artificial horizon, and two small compasses; and by help of these notices was sketched the present map of the Amur, which from its extent, breadth, and depth, its richness in islands and tributary streams, and the width of its mouth, ranks among the largest rivers of the world.

The Amur originates by the junction (near the Staniza, or the watch-post Usl-Strelotschnaja) of two swift rivers, the Schilka and the Argun, and begins its course through a mountainous and wooded country. Finding its way through the bold and bluff sides of the ranges by which it is surrounded, it makes very numerous and irregular curves, and is swollen by a great many mountain rivers. The wild and rough character of the banks of the upper Amur continues to the ruins of Albasin. So far the vegetation displays but a comparatively small variety: firs of all sizes, larch trees, elseberry, shrubs, and sand-willows [? *Sorbus*—A. P.] Such are all the eyes of the traveller behold; and, moreover, the two first named species of forest trees are wantonly destroyed by the Tunguse, when wandering here. The rocks forming the steep banks of the river are covered by a thin layer of moss during both the cold of the winter and the short but ardent heat of the summer. Along the banks sometimes are found meadows and a few valleys, in almost all of which flow brooks, rich in fish, which pour into the Amur those enormous masses of water, that raise its level in two or three days sometimes by two fathoms. Islands, both isolated and in clusters, are met with frequently; but most of them are situated where the banks are much indented, and are separated from the above only at high water. The inundations of the river, which fertilize these islands, are what enable them to bring forth the elseberry shrubs, which furnish, as we shall see, one of the principal means of livelihood to the nomadic tribes.

The ruins of Albasin interrupt for a time these but little attractive banks. Here the hills retire, and between them and the river are fine meadowy plains, the southern half of which is watered by the rivulet Emuri or Albasicha. The rich pastures and the situation, protected from the northern winds, confirm the wise choice of the old Kossacks, who made this place their chief settlement. The site of the town could not possibly have been better selected: it stands on a height commanding all the approaches, protected against cold winds, and in the neighbourhood of both water and wood. The river Albasicha yields besides much fish, which the rapidity and depth render it impossible to procure in the Amur itself.

Off Albasin, the numbers of the islands increase, and look more like an archipelago, such as is to be found often in the middle of the

* The Russian *verst* is 1,166⅔ yards, or 3,500 feet, English, that is, about two-thirds of a mile.

river. This intricate abundance of islands gives to the Amur a peculiar character, not favourable to navigation, but original and picturesque. Here the mountain ranges stand afar from the river, and permit its banks to take a free curve; approaching again from time to time, and running in steep slopes alongside its brilliant bed, only to retire, and, becoming gradually lower, to change into a chain of separated steep hills. This alteration in the direction and situation of the branches of the chief mountain, becomes particularly obvious from the rock Malaga Nadeschda, [*i.e.*, from the point where the Amur turns to the South,] and extends to the River Kamara, where the banks of the Amur are again bordered on both sides by almost uninterrupted mountain ranges.

With the break in the connection of the mountains, a change in the aspect of the country is also observable. Among the fir and larch trees are frequently to be found others well supplied with foliage, the most prominent of which is the birch; but even the former look a little more cheerful. They no more cluster in impenetrable thickets, but appear sparely, and are so little taken care of by the nomade tribes, that there are to be seen on each verst dozens of trees, bereft of their evergreen clothing.

Besides the rock Malaga Nadeschda, there are between the rivers Albasicha and Kamara several by no means inconsiderable hills and cliffs, amongst which the first place is due to the promontories Kasakewitsch and Korsakoff. The rock Malaga Nadeschda is situated below a bar three feet in depth at low water, its half round tower projecting far into the river; and for this reason it was selected to shelter the steamer *Nadeschda*, which was left there, and from which circumstance the rock received its name, (Nadeschda, *hope;* Malaga Nadeschda, *little hope.*) The mountain Zagajan is a short range of white, steep cliffs, which are situated as a crescent round one of the curves formed by the river. The height of these cliffs is about 250 feet; and near the middle of this height is to be seen a dark streak, from which rises a black smoke at several places, where craters have been formed. The Mandschures [? Manchus,] who prepare at this place timber and boards, say these rocks are always smoking, and sometimes in considerable volume.

The capes Kasakewitsch, 52° 1′ N., and Korsakoff, two German miles South from the former, are almost of the same height, about 300 feet. Both are formed by reddish masses of sandstone, and have a very rugged surface. The first of these two capes is remarkable on account of a rock on its S.W. side, separated from the body of the mountain forming the cape, and assuming the shape of a colossal human form with a helmet on its head, seated on one of the steps of the cliff, as if thoughtfully leaning towards the bulky bulwark. The second cape astonishes beholders by the regularity of the half-rounded steps which form the side towards the river, and which are separated from each other by deep clefts. This side shows likewise a well-rounded slope, richly covered with grass. In consequence of the inconsiderable curving of the river between these two capes, an alluvial

deposit has been formed, which has become consolidated by degrees, and is now covered with dense brushwood of the sand-willow.

From the cape Korsakoff to the mouth of the river Kamara, the Amur makes but one somewhat considerable curve, and the mountains appear chiefly on the right bank; on the left bank they approach the river at the cape Bibikoff. In the geography of the Amur, the river Kamara occupies one of the chief positions; for during the winter the nomade tribes assemble on its banks, and there also is the most northerly of the Manchu watchposts, established to overlook the tribes who are subjected to China. This river Kamara has its sources on the same mountain range from which spring the rivers Girel and Gan, the former of which runs from the same side with the Kamara, and flows into the Sungari; the Gan has its source on the opposite side, turns to N.W., and falls into the Argun at Zurachaife. The Kamara runs a considerable way, partly through mountainous, partly through level, lands, and according to the testimony of the Manegres tribe, who roam thereabout, it has, for a ten days' sail inland from the mouth, (which would be nearly equal to 250 versts,) a depth of one fathom. The neighbourhood of the river is rich in moosedeer, wild goats, sables, squirrels, &c., which allure to its banks a great number of Manegres, who have raised their turtes [? tents or huts] to two and three together along the whole navigable part of the river.

In a short review of the Amur tribes we shall again have the opportunity of saying a few words about the Kamara, and now proceed to the banks of the Amur. There the eye of the traveller is first attracted by the cape Bibikoff, resembling the capes Kasakewitsch and Korsakoff, but appearing more favourable from contrast with the adjoining plains. Behind an alluvial narrow bank the wall of the cape rises abruptly to a height of 200 feet; further along it inclines towards the river side, and, forming a curious ridge, rises a graduated bare rock, by which the cape Bibikoff is connected with a lower range of hills, running from it along the left bank of the river. On the right bank of the Amur the mountains commence at a little tributary river South of the watch-post, and continue beyond the Manchu village Dagige (written Dagigo on the map), where they disappear gradually in the Aiguntian plains.

In that part of the Amur just examined by us, *i.e.*, between the rivers Kamara and Seja, the islands appear isolated, as in its higher parts; but in the neighbourhood of the Manchu watch-post Uluss-Samodon, the river makes two considerable curves inward, so that the little isthmus between them is only three-quarters of a verst wide at one place. The vegetation is the same, only the firs are stouter. Under 50° 26′ N., were found, on the alluvial shallows, and on the islands of the right bank, a few pieces of drift coal, but of very inferior quality. This discovery, however, is important, as affording reason to hope that there are deposits of the mineral further up the river. Except a few jurtres [*orig.*, jurten,] of birch bark, and the two watch-posts Kamarsk and Uluss-Samodon, there are between the

river Kamara and the village Dagige only a few houses, which were empty when we were there, and served probably as an abode in winter to the half-settled tribes, who, during the summer are out hunting and fishing.

The river Seja is the limit of the mountain-country; from hence begin the long plains along both banks of the Amur, which are on the right interrupted slightly by a few isolated hills, and on the left are, as far as the eye can reach, perfectly level. Except a few trees on the banks of the river, behind which the villages of the Manchus are concealed, no wood is found on this large space; and, notwithstanding the comparatively dense population, the flocks of cattle, and the cultivated fields, one regrets the country left behind, where was met at every step, a rock, a valley, or a joyous murmuring rivulet. The Manchu villages begin at the river Seja, and at first form a line along the left bank of the river; then, before the town Aigunt, they change to the right bank, and touch almost this town, which is likewise called Sachalin-Ula-Choton (Sachaljan-Ula-Choten on the map) or Cheilundzantschen.

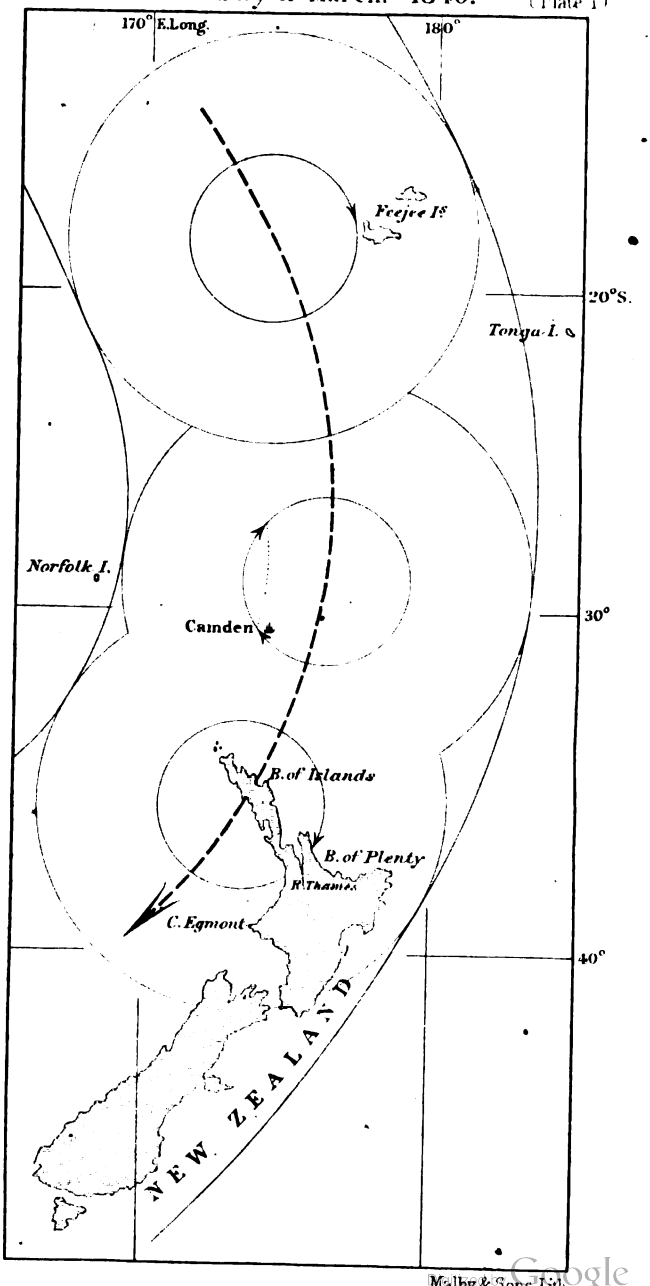
The reader must not imagine that Aigunt contains straight and regular streets formed of cleanly houses,—such attributes of an European town are not to be found here; it is a small place, surrounded with pallisades, with a citadel and a few mud cottages, which, however, are symmetrically enough arranged. Northwards from the town, on the bank of the river, are some long Sarais, and in their neighbourhood the vessels are anchored and drawn on the bank. Probably this place serves the whole Chinese-Amurian fleet as a harbour and head-quarters. The fleet consists, by our calculation, of twelve large one-masted boats, which are fit for navigation, and of which we met six on our way to Kiso or Marunsk. Eighteen of such boats were without masts, and seventeen of them, not being serviceable, are drawn on shore.

Below Aigunt continue the villages, but fifty versts further on, they become more scarce, and cease at last altogether, at the beginning of a new archipelago when the river turns to the East. The labyrinthical archipelago commencing here occupies an uninterrupted space of nearly 200 versts. The banks of the river remain low, and only insignificant hills show themselves, covered with such trees as pines, oaks, and elms; the latter occurring frequently and in great number on several of the higher islands. The trees attain sometimes a considerable size, and yield very good timber for shipping purposes.

Approaching the river Burija, the elevations become more frequent; the Amur forms one river and takes wide curves. The river Burija enters the Amur from the left side at two mouths, in lat. 49° 23′ N., and long. 8° 42′ 33″ E. from Greenwich. This river seems to be but little frequented by the population of the Amur banks; at least we were not able to collect any information about it from the Daurians and Manchus whom we encountered. Situated half-way up the Amur, the length of which is 1,500 miles, [? German or English,] and in one

SOUTH PACIFIC HURRICANES.

February & March. 1840. (Plate I.)



Malby & Sons, Lith.

of the best localities, the river Burija must excite particular attention in the colonization of the country, and there will probably in time rise one of the first Amur towns near the top of its principal mouth.

From the river Burija to the cape Sberbiegeff, that is to the beginning of the faster current of the Amur, where it finds its way through a rocky frame, the banks are high, but woodless. On all sides are to be seen, at greater or lesser distances, hills, which sometimes approach the bank closely and form sandy slopes; the higher, being densely covered with vegetation, offer so many agricultural advantages, that even the Daurians, whose chief occupation is the chase, have on them established little farms.

(To be continued.)

On the Hurricanes of the South Pacific Ocean.—No. I.

By Thomas Dobson, B.A., of the Royal Naval Schools, Greenwich Hospital.

The materials for the following attempt to determine the nature of the hurricanes of the South Pacific Ocean, and more especially the general direction of their progressive motion, were collected principally during a residence of six years in the seaports of Australia, Tasmania, and New Zealand.

Through the kind offices of Sir W. Denison at Hobart Town, and of the Hydrographer of the Admiralty at London, I have had the opportunity of examining the log books of many of the vessels of war which have been in the Australian seas. At Hobart Town, Auckland, and Sydney, I met with several missionaries who have resided many years on those inter-tropical islands where hurricanes are always destructive, and often the precursors of a general famine, and are consequently recorded with care in the diary of the missionary. To this source I am indebted for some most useful notices of storms. The log books of the missionary vessels, the *Camden*, the *John Wesley*. and the *John Williams;* as well as those of many merchant vessels, have been carefully examined; and the files of the colonial newspapers, the meteorological records of the various colonial observatories and lighthouses consulted when requisite.

That the hurricanes of the South Pacific Ocean are cyclones, and follow the law of rotation peculiar to the cyclones of the southern hemisphere, are results that I confidently anticipated before undertaking this investigation; but as the details of storm after storm were examined, the more and more clearly it appeared that the initial progressive motion of each was to the eastward. This striking anomaly*

* Surely this is no anomaly. The principle of curving round and assuming an easterly course seems to be the same as in the Indian Ocean in the neighbourhood of Mauritius, only 5° further South.—Ed.

is most apparent in the case of the storms that pass over the Navigator Islands and Rarotonga.

I shall first consider a class of storms that proceed to the southward in February and March along a track that follows closely the bend of the eastern coast of Australia, and finally passes over New Zealand.

In the Narrative of the American Exploring Expedition, Commodore Wilkes gives the following account of a storm at the Feejee Islands.

"At the Feejee group, from November to April, the winds prevail from the E.N.E. to the S.E. quarter, at times blowing a fresh trade wind. From November to April northerly winds are often experienced, and in February and March heavy gales are frequent. They usually begin at the N.E., pass round to the North and N.W., from which quarters they blow with most violence; then, hauling to the westward, they moderate.

"A very heavy gale was experienced from the 22nd to the 25th of February, 1840. The only data I could get to be at all depended upon, were from Captain Engleston, whose ship was lying under Toba Peak, on the North shore of Vitilevu. The gale began from the N.E., with heavy rain, on the morning of the 22nd. During the night and the morning of the 23rd, it was more to the North, increasing with heavy gusts. They let go a third anchor, and sent down the topmasts and lower yards. On the 24th the gale was the same with much rain; the wind hauling to the westward at midnight of the 25th. It became N.W. in the morning, and began to moderate; the wind hauling gradually to the southward, when it cleared off. This gale was not felt at Tonga, although they had strong winds there at the time."

The wind here veers continuously from N.E. through North and N.W. to the southward of West. If this storm, therefore, was a cyclone, the centre passed on the West of Vitilevu, and proceeded in a direction a little to the eastward of South; its eastern margin just grazing the Tonga Islands.

These inferences are fully confirmed by the following extract from the Journal of Captain Morgan, now of the missionary brig *John Williams*, who was at that time between the Feejee Islands and New Zealand, in the *Camden*, bound from Sydney to Tutuilah.

"1840, Feb. 27th, lat. 31° 45′ S., long. 171° 52′ E.; wind shifted suddenly from North to S.W., and then to S.E."

"28th, Friday.—Increasing breeze from eastward; barometer falling gradually. Midnight, under double reefed topsail and foresail. Lat. 31° S., long. 174° 7′ E."

"29th, Saturday, wind increased from S.E. till 10h. a.m., when it blew a perfect gale,—yea, a hurricane. Barometer 28·40. Took in all sail and lay on our side; kept the pumps sucking; the water came up the skin into the cabins between decks. The sea stove the whale boat, triced up in the rigging, and we were forced to cut her away. At noon it began to abate a little, and at 2h. p.m. the gale

had subsided. Sent down top gallant yards, with fore top gallant mast. At 7h. p.m. wore round, the wind at S.W., set maintop and foresail, steering N.E."

"March 1st.—A light S.E. wind. I have known it to blow as hard, but never harder; we could not look to windward for a second at a time."

Mr. G. A. Lundie, a passenger by the *Camden*, in a work entitled *Missionary Life in Samao*, published in 1849, says:—

"A few days since, we met a fearful ard long-continued hurricane. Friday (28th) was a day of rough and restless calm; the barometer fell gradually. In the evening a fresh breeze set in, increasing gradually till 4h. a.m. (29th). Lay to under small sail, to keep the vessel from rolling. Eight a.m., without a stitch of canvas, at the mercy of the fierce wind and infuriated waves. The lee bulwarks and nearly half the deck under the boiling waters; the day time darkness rendered more dismal by the burning of a solitary lamp. Boat, bulwarks, &c., carried away. At 11h. 45m. a.m. the mercury began to rise; at 1h. p.m. the rain had ceased, but the wind had not perceptibly abated. The sun shone out at 4h. p.m., the wind subsided, and continued to abate till Sunday morning."

The shift of wind from S.E. to S.W. shows that the centre lay to the eastward of the *Camden*, and was proceeding nearly due South towards New Zealand.

H.M.S. *Herald* was at that time lying at anchor in Waitemata Harbour (River Thames, New Zealand.) On the morning of the 29th of February, the wind was S.E., of force 3 to 4; barometer 29·94. At 9h. 15m. p.m. it blew a heavy gale, increasing to a hurricane (12) from East at midnight; the mercury having gradually sunk to 28·90. At 2h. a.m. of the 1st of March, while still blowing a hurricane, the wind veered in tremendous gusts from E.b.N. to N.N.E.; barometer 28·75; after which the mercury rose to 29·85 at 10h. p.m.; and ranged between 29·80 and 29·87 during the two following days. Froom noon to midnight of the 1st the wind was North (11, 8, 4); throughout the 2nd N.W. (4); and during the 3rd N.W. and West (4, 3).

It is evident that at 2h. a.m. of the 1st of March, the centre of the cyclone lay very near to, and on the West of the *Herald*, and was travelling towards the S.S.W.

The distance from Vitilevu to Waitemata on a great circle is 1,150 miles; so that making an allowance of 150 miles for the curvature of the track to the eastward, its length may be assmued to be 1,300 miles; which had been traversed from between noon of the 24th of February and 2h. a.m. of the 1st of March; *i.e.* in 134 hours, giving a mean velocity of progression of about ten miles an hour.

The Narrative of Commodore Wilkes contains a good description of the storm at New Zealand:—

"On the 29th of February, 1840, there was a violent gale at the Bay of Islands, New Zealand, said by the missionaries to have been

the severest they had experienced, with perhaps the exception of one, which took place shortly after their arrival. Many vessels suffered great damage. The *Thom*, of Sag Harbour, which sailed a few days before, bound home, was obliged to put back in consequence of the damage received, and was condemned as unseaworthy; as was also the *Tuscan*, an English whaler. The barque *Nimrod* arrived, having lost her topmast; several coasters were missing, and supposed to have been lost. Most of the vessels lying off Kororarika dragged their anchors. The *Harriet* was driven ashore at Tipoona; she parted her cables during the night, and next morning was found a complete wreck; the crew barely escaped with their lives. On land, fences were carried away, houses and grounds deluged, and the extensive embankment of the missionary establishment at Pahia, nearly demolished. The tide rose six feet beyond its usual mark, during the night of Saturday. This gale was experienced at the Thames, on board H.M.S. *Herald*, one hundred and forty miles to the South; also by the *Flying Fish*, off Cook Straits, on the East; and by the barque *Achilles* to the North. Mr. Hale was a passenger in the *Achilles*, and took barometrical observations and notes, from which it appears that the change took place, at the two northern and two southern positions, in opposite directions, proving that the gale was a rotatory one; and that its centre must have passed between the Bay of Islands and the River Thames. The greatest force of the gale was between 1h. a.m. and 3h. a.m. of the 1st of March. At the Bay of Islands a *calm* was observed by Mr. Dana and others, which lasted fifteen minutes, after which the wind rapidly hauled round to the westward, and blew with increased violence."

"On board the *Herald* the barometer fell to 28·75; and as the gale was experienced first to the northward and eastward, it is certain that it came from that quarter, and passed over New Zealand in a S.W. direction. The width of its track was about five hundred miles."

On the 29th of February the *Flying Fish* was in 40° S., and 175° 30′ E. At noon the wind hauled to S.E., and by midnight blew a most violent gale, hauling to the eastward till about 8h. p.m. (March 1st), when its violence moderated.

In a note to page 61 of the *Sailor's Horn Book of Storms*, Mr. Piddington, speaking of this storm, says:—

"Its track to the south-westward, or perhaps S.S.W., after crossing the island, I am enabled perhaps to corroborate from a log in my possession of the *Adelaide*, which vessel, between the 1st and 2nd of March, about 3° 30′ due West of Cape Egmont, experienced a smart gale, commencing at about E.b.S. or E.S.E. and veering to S.b.E., reducing her to close reefs, with a heavy cross sea. This, roughly calculated, gives three hundred and forty miles for thirty-six hours, or about ten miles per hour."

There is probably a misprint here, for the change of wind from E.S.E. to S.b.E. would indicate a progressive motion towards the S.E.½S., instead of S.S.W.

From letters to the editor of the *Sydney Morning Herald*, and various paragraphs, we are enabled to judge of the effects of the storm on the coasts of New Zealand.

A letter, dated Kororarika, Bay of Islands, March 11th, 1840, states,—

"We suffered dreadfully here from a hurricane on the night of the 29th of February; all our boats were knocked to pieces, palings blown away, and we expected every moment that our houses would have taken flight. Never was such a night. The natives were up the entire night saving their canoes. Several persons were obliged to open their doors to let the sea rush through. It was a terrible night. Had it lasted two hours more, it would have swept everything before it. Every ship drove. The *Herald* lay snug, but had two of her boats swamped, and lost all their gear. The *Tuscan* and *Tobacco Plant*, American whalers, have come in in such a leaky state, that they will have to be condemned. The *Harriet*, of Sydney, was totally wrecked in the gale; she drove on the rocks off the mouth of the Kiri-kiri, with both anchors down ahead."

There were lost in the Bay of Plenty:—the schooner *Falcon*, crew saved; the *Felix*, crew lost; the *Ulietea*, crew saved; the *Industry*, crew saved; and the schooner *Trent*, by stranding in the River Thames. Thirty-eight boats were lost in the Bay of Islands. The *Navarino*, from Kaipara, is a total wreck. During the hurricane a heavy flood inundated the site of the proposed capital of the New Zealand Colonization Company.

From *Wakefield's Adventures in New Zealand*, we learn that the wind was North, with rain, at Wellington, from the 23rd to the 27th of February, 1840, followed by a heavy S.E. gale from the 1st of March to noon of the 4th, and great floods at the Hutt.

At Whakatane, in the Bay of Plenty, in 1854, I met with Mr. P. Tapsell, who commanded the *Falcon*, schooner, of 190 tons, when she was lost. He was proceeding at the time to Maketu, to take in a cargo of flax. On the 29th of February, the wind was from the East, with a very heavy swell from North. Midnight.—Wind shifted round to the North, with a very heavy sea, which broke clean over the fore-yard and filled the hold. Let go the second anchor; the chain parted, and the vessel struck on the beach at Tumoo. The natives from the Pa immediately plundered and stripped her. At Whakatane, I was told that the sea dashed over the great sandbank that skirts the beach, even up to the Pa, and that several of the large isolated rocks off the coast were thrown down.

This cyclone passed to the southward of Tasmania, for it is remarked in the *Colonial Times*, a Hobart Town newspaper, of March 3rd, 1840, that—

"Nothing could have been finer than the weather during the past week. The temperature moderate and steady, neither hot winds during the day, nor chilling dews in the night. It is most improbable, then, that atmospherical causes can at all contribute to the exist-

ing fatal malignant fever. Barometer at 12h. to-day, 30·01°; thermometer, in shade, 64°."

The *Vincennes* was in 50° S. and 135° E., and had no storm.

The consideration of this storm may tend to account for the occurrence of the well known Tonga or "Souther" so much dreaded by all New Zealand coasters.

The Whale of the Californian Coast.

A memoir compiled from observations made at the offices of the Consuls at San Francisco by the commanders of whale ships and deposited at the Chamber of Commerce in that town, gives some curious details on the nature of the whales which are captured on the coasts of California. This memoir contains a series of facts collected during a period of fifteen years.

The whales which frequent these coasts do not form a distinct species in natural history, but are distinguished by a peculiar character, by some modifications in the colour of the skin, and the proportions of certain organs. The body has rather an elongated elliptic form; the skin is darker and more shining, and the head is an enormous mass, which is estimated at a little more than a fourth of the whole animal. They are also longer than the common whale and frequently more than eighty feet long. One killed in 1856 measured fully one hundred and two feet.

The organs of sense in the Californian whales are finer than in the others, and that of hearing, which scarcely belongs to the others, is extremely fine. The eye is also larger and more piercing. They are longer lived than the others, and have two at a birth, a circumstance which very rarely occurs with others. The young whales are generally thirty or thirty-five feet long; they stay by the mother and defend her when she is attacked, and have been observed, when too weak to be of service to her, to expose themselves to the whalers with the view of exciting their attention, so that their mother may escape. The physical difference between these whales and the ordinary ones have even a greater difference of character. The Californian whale not only defends itself vigorously, but frequently attacks his assailants. He does not disdain to resort to stratagem in addition to his physical strength. In 1857 one of these animals having been unsuccessfully harpooned, feigning death under the severity of his wounds, allowed two of the whaler's boats to approach him, and as soon as they were close to him rallied up and capsized the boats. Both the boats' crews, which had come to dispose of him, believing him to be dead, perished under the effects of his revenge. Many other instances of the kind might be cited proving how dangerous this whale is, and how cau-

tiously he should be dealt with. Great is the number of seamen who perish every season by this whale, and his destructive propensities, therefore, cannot be too well known. It is with this view that we insert the present notice, for he has made a deep impression on the maritime community of San Francisco.

Whale fishing was practised by the ancients. According to Oppian, Xenocrates, Pliny, and Strabo, and some others of the ancient authors, it was followed by the Tyrians, Greeks, Romans, and people who dwelt on the shores of the Arabian Gulf. It was also in vogue among the Chinese, and at the end of the ninth century was a principal branch of maritime commerce. At the same time in Europe the people of the North, and principally of Iceland, Norway, and Finland, fished with success on the coast of Flanders, Lapland, and Greenland. But the Basque fishermen surpassed them in tact and courage. In the bay of Biscay they had long pursued the whale fishery, and about the fifteenth and sixteenth centuries extended their fishery to the shores of Canada and Greenland. The mariners of Brittany and Normandy, Annis and Guyenne, shared with the Basque fishermen considerable profit in the whale fishery. Towards the end of the seventeenth century the whale ships of Holland began to assume importance. Their success roused the spirit of the English, who in 1598, joined them with their concurrence, sent several ships to the Greenland fishery, and eventually, by their industry, became the leaders in it.

We shall see in a future paper the enormous developement which the subject has assumed at the present time.

The Indian Ocean considered with Reference to the Wants of Seamen.

(Concluded from page 510).

Second and Third Routes,—East of Formosa.—A ship adopting the second route, East of Formosa, on leaving the Lema Isles would keep the coast, as above stated, taking advantage of every favourable circumstance to make Easting. At the same time she would avoid the adverse current, which she would find out at sea, by keeping by day in the tranquil waters of those bays, which are safe; and if the wind is too strong, it would be wise, when near a good anchorage, to keep it, until it becomes less. In fact, she would make to the Eastward when the wind admits, and get shelter from the land when it is unfair. This is, in reality, the most difficult part of the passage, and requires constant attention.

The ship having reached far enough along the coast, that is, when, according to some commanders, she has reached Ma-Urh, she would make for the S.E. point of Formosa. With the wind at N.E. some

commanders would leave the coast of China before reaching this cape; but however this may be, having doubled it the ship may then, according to the wind, pass either East or West of the Meia-co-sima group.

This second route has the advantage of a favourable current, setting strongly to the Northward of Formosa. When the wind at sea hauls to the Eastward of North, which is generally followed again by strong winds from N.W., the ship would adopt the most favourable tack. But she should by all means avoid the land until she is North of Kew-Shaw, and then if desired may find a good anchorage under shelter of these islands.

Mr. Foster, in alluding to these routes, says, that the currents of the strait of Formosa should deter any ship from taking the first route, and that the route outside Formosa, or to the East, is generally more advantageous during the N.E. monsoon. He also adds, that even leaving Amoy for the Chusan Isles a vessel should pass East of Formosa unless she is unable to work out of the strait. It is an opinion that should be followed.

From India to the East Coast of Australia.—From the routes previously given it will be easy to select that which should be followed by a ship bound from the different ports of the Indian Ocean to Port Jackson on the East coast of Australia. There are two which we shall content ourselves by pointing out.

North Route.—The first is the North route, by passing through Torres Strait. This might be adopted from the beginning of September to the end of March, the period of the N.W. monsoon in those latitudes: the other the South route, by which a ship passes to the South of Australia and through Bass Strait, is adopted from March to September, when the S.E. monsoon prevails in Torres Strait.

The navigation of Torres Strait belongs to that of the Pacific Ocean, and is of a local character.

For the Southern route it will be easy to deduce directions from those we have previously given. The ship from a place in the Northern part of the Indian Ocean, should endeavour to gain as speedily as possible the zone of the trade winds, and should cross this zone as soon as she can by an oblique course inclining to the West coast of Australia. She would then keep along the South coast for Bass Strait.

If she is from the Cape of Good Hope she would take the same route as that described as the great East passage to China.

From China to the East Coast of Australia.—A ship leaving Canton, during the S.W. monsoon, for the East coast of Australia, the shortest route generally is the Eastern one by entering the Pacific Ocean South of Formosa; she would then make sufficient Easting to enable her to stand across the trade winds from N.E. and S.E., so as to find herself to the East of the port of Australia to which she is bound by the time she has gained its latitude. This route presents no other difficulties than those of sailing among theislands of the Pacific Ocean.

This will be, however, very tedious and difficult work in the N.E. monsoon; for the ship must take the Pacific by the strait South of Formosa, and then work to the Eastward and Northward against the N.E. trades, and look for the variables to the North of the parallel of 30° N., with which she may get to the Eastward, therefore on leaving the China Sea she should get out of the trade winds as fast as possible. As a rule she would stand as far as the meridian of 165° E. before running South.

But during the N.E. monsoon, that is, from September to February, a ship would find it more advantageous to keep in the China Sea, and would avoid a great deal of bad weather, besides making a quicker passage. She should pass East of the Great Natuna, and then take the Carimata Channel, and would next make for the East point of Madura, and pass between Pondy and Galion Islands, if deciding to take Bally Strait. It is, however, preferable to take that of Lombock, and more so still to adopt Allass Strait.

A ship leaving these straits should stand to the Southward, profiting by the changes of wind, which in this season are generally S.S.W. and S.S.E. in the space between the limit of the trade winds and the Eastern straits. The ship should therefore make a long stretch even Westerly to cross the zone of the trade winds, and get into the variables of the Southern hemisphere, and when she has reached them she will soon make up her Easting. In March and April she may pass through Bass Strait, or, if preferred, South of Tasmania, as Easterly winds prevail in that strait during these two months. At all other times Bass Strait would be adopted as the most direct and shortest route.

Ports on the East of Australia to India,—Southern Route.—A ship leaving Port Jackson or any port on the East coast of Australia for India, may take the route through Bass Strait or round the South coast of Tasmania, when commencing her voyage between the beginning of September and the first of March. In January, February, and March, near Tasmania, she will find S.E. winds more prevalent than during all the other months. She will profit by these winds in making to the Westward, but must give a wide berth to the Australian coast, in order not to lose by a change of the wind, and not to be caught too near the shore by heavy S.W. squalls, which prevail at this period.

Some vessels bound to Europe also take this route during the winter months, June, July, and August. It is true they suffer much from bad weather, but the passage is not impossible even during this season. As much as possible she would endeavour to reach the trade winds, and when found would shape the most convenient course for the port to which she is bound. Under favourable circumstances a passage from Port Jackson to Bengal may be effected in two months; some vessels have been fifty days in going from Bass Strait to False Bay; but during the summer months (October, November, and December) the best passages have been made.

Northern Routes, through Torres Straits.—From March to Sep

tember the passage from Port Jackson to Bengal or ports of the inland seas, is made through Torres Strait. In this route the ship runs to the Northward along the coast of Australia as far as Sandy Cape; and then takes the inner passage. A ship taking the outer passage on leaving Port Jackson would make the best of her way to the meridian of 155° and should then pass West of Howe and Middleton Islands; then stand on to the North, keeping a look out for Wreck Reef and the Bampton Shoals, the Minerva, Bellona, Ball, and Kenn Reefs, &c.; which must be passed between Lamb and Bass Islands, all lying between the parallels of 24° and 20° S. lat. Great care must also be taken to allow for a N.W. current, or Westerly, of at least one mile an hour, sometimes more. When Wreck Reef is passed, the course should be shaped so as to pass about sixty miles East of the Diana Bank for Torres Strait.

Port Jackson to India, East of New Guinea.—The best route for a ship bound to India or China from Port Jackson, not taking the Southern route by Bass Strait, nor the Northern by Torres Strait, will be to pass East of New Guinea and take Pitt Passage, and then cross the Java Sea or take the strait of Ombay. But this route, like the Northern route, should only be taken from March to September, that is, when the S.E. monsoon prevails South of the equator. On leaving Port Jackson or Tasmania she would make to the Eastward, keeping also a little North till she reaches the meridian of 160° E.; then stand to the Northward, keeping nearly on this meridian, and passing away East of Howe and Middleton Islands, Wreck Reef, and the Cato Shoals.

Capt. Bristow considers it preferable, on leaving Port Jackson, to stand to the Northward as far as the latitude of Sandy Cape, passing West of the abovementioned dangers. A ship would thus pass New Caledonia in the East, taking great care to avoid the dangers of those latitudes, and then steer for Cape St. George, the South point of New Ireland.

If desiring to enter the St. George Channel and Pitt Passage, the ship should keep well in to the coast of New Guinea, to avoid the Easterly currents and light N.W. winds that are frequently found North of the equator, and which set vessels out to sea. Having therefore reached the meridian of 134°, she would keep near the coast of New Guinea when approaching Pitt Channel in the S.E. monsoon from March to September.

Instead of taking the St. George Channel the ship may use that between New Britain and King William Cape, passing on either side of Rooke Island; from thence she would steer so as to pass between Lottin and Loupee Islands, or this last may be rounded on the West, according to circumstances. She would then continue along the coast of New Guinea, passing North of the off-lying islands from the Astrolabe Bay as far as Isle Dumont Durville, and continue along the coast as far as the point of this name. From this point she would stand on so as to pass North of the Traitor Islands, Mysory, and Providence, and then make the coast of New Guinea at Cape Mamori, steering along the coast as far as Cape Good Hope, and then make for

Pitt Passage through Dampier Strait. This route is shorter and more direct than that by St. George Channel, and there are fewer dangers to guard against in it.

The ship having reached Pitt Passage through Dampier Strait, or by any that appears more suitable, would be guided by the general directions previously given for proceeding to China through Pitt Passage, passing East of the Philippine Islands.

When the N.W. monsoon prevails South of the equator, a ship bound for India should not keep near the coast of New Guinea as above directed. In November, December, and January, it is better to get to the Northward as far as latitude 5° N., near which the N.E. trade may be expected. At this season, also, the ship would pass South of Mindanao, through Basselan Strait, and cross the Sooloo Sea, and then enter the China Sea by the strait of Balabac, North of the isles of Benguey and Balambangam. Then crossing the China Sea she would take the strait of Malacca. This route is doubtless the best for India during the N.E. monsoon from the East coast of Australia or Tasmania.

Eastern Routes for China or India, from the East Coast of Australia.—A ship from the same coasts bound to China or India, while the N.W. monsoon prevails South of the line, (from September to March,) and not adopting the Southern route by Bass Strait, would encounter heavy winds if she takes the Eastern route, that is, a route still more Easterly than the last mentioned. In this case either one of two routes is generally adopted; the first passing West of New Caledonia, the New Hebrides, and the Santa Cruz Islands, and East of the Solomon Isles. The second passing East of New Caledonia, the New Hebrides, and Santa Cruz Islands. These two routes are nearly the same as those given for the Great Eastern passage from the Cape of Good Hope to China.

First Eastern Route.—A ship adopting the first of these routes on leaving Port Jackson, would steer E.N.E. to profit by the regular breezes prevailing out at sea, and having reached the meridian of 160° E. long., would then pass to the Eastward and Northward of Howe and Middleton Isles; and as off New Caledonia S.W. winds are often found, it must not be approached too close. After rounding this island to the Westward the ship would continue Northward, keeping on the meridian of 164°, so as to enter the channel between the islands of Santa Cruz and the Solomon Islands. This group being passed, if in the first months of the monsoon the ship is to be in China, a Northerly course should be adopted to cross the Caroline Archipelago, having cleared which a course must then be shaped for Guano Island, reaching which one of the channels of the Marianne Islands would be taken for the Bashee Islands Channel.

In case the ship should not reach the Solomon Isles till after January, when the N.E. monsoon is less strong in the China Sea, the ship may pass between the islands of Guap and Goulon, or between this latter and the Pellew Isles. From thence she would round the N.E.

point of Luconia, and take the most suitable channel for crossing the strait of Formosa and reaching China.

Second Eastern Route.—The second Eastern route from the Eastern coast of Australia or Tasmania to China is longer than the foregoing; but has not so many dangers to avoid, besides possessing the advantage of more regular winds than those found West of New Caledonia and the New Hebrides. But in passing to windward of these islands the Westerly currents found in crossing the zone of the S.E. trade winds must be carefully provided for.

On leaving port it will be best to make Norfolk Island, or else to pass a short distance West of it, and then make for Isle Matthew, which may be seen at the distance of twenty-four miles. The ship would then pass East of New Caledonia, the New Hebrides, and the neighbouring isles, leaving those of Viti to the Eastward, and giving the New Hebrides a good berth, would keep on the meridian of 171° or 172°. If the ship cannot round Erronan Island, the Easternmost of the latter, the channel separating it from Tanna may be taken, from whence she would steer North as far as latitude 13° S. If the New Hebrides have not been sighted the ship must endeavour to make Tipokia Isle, or Fataka, and then continue her Northern course to cross the equator between 160° and 168° E. As the current generally sets strong to the Westward, the ship should endeavour to reach the Carolines on the meridian of 163°, and if she has crossed the line in 160° or 162° E., she should endeavour to cross this archipelago between the meridians of 154° and 153°. On leaving the Carolines, she would pass South of the Mariannes, or through one of the channels formed by these islands, and then make for the Channel South of Formosa to enter the China Sea.

In the tracks abovementioned should any unforeseen circumstance prevent a ship from reaching China before the end of the N.E. monsoon, when she is North of the equator the latter part of the route should be changed. She should then pass South of Mindanao and take Basselan Strait; she may also in this case cross the Philippines, taking Panaon or Surigao Strait, or that of St. Bernardino. The first is North of Mindanao, the second North of Samar. By the first the Sooloo Sea, is entered; by the second the China Sea is entered North of Mindoro. She may also pass South of this last island, taking the strait of Mindoro. In entering the China Sea from the Pacific Ocean the strait of St. Bernardino is generally preferred to that of Surigao.

[The foregoing paper and those which have preceded it on the same subject are collected into a small volume, published by Potter, 31, Poultry, with the title *Directions for Navigating the Indian Ocean, China and Australian Seas,* accompanied by charts.]

Lake Baikal.

A recent communication to the Academy of Sciences at St. Petersburgh, gives some new and interesting details on Lake Baikal. This lake, called also the Sea of Baikal or the Holy Sea, is situated in the district of Ibkourtsk, in Siberia, not far from the frontier of China. Its name is grafted into the Yakoutch language, in which the word "bai," signifies rich, and the word "kal," means lake, which two would form rich lake. The Russians formerly called it *Valiko ozero* or great lake. At present, independent of the name Baikal, by which it is scientifically known, it is called *Sviatore More* or Holy Sea, derived from a rock of the isle of Alkhon on which the Bowiairites offered sacrifices, and for which they had a religious respect, because they believed that the island was the residence of an inferior divinity named Begdzi.

This rock of granite is six feet high and fifty in circumference. The island on which it is situated is 54 miles long and 34 wide. It affords numerous sources of riches. It yields excellent timber for building, and is inhabited by a Mongolian tribe, named Bargou Bouriaites, who cultivate the ground, rear excellent cattle, fish, and hunt principally wolves, hares, and squirrels, of which there are an enormous quantity there. This island is the largest in the whole lake. The others are, Isle Malezis, that of Anses, that of Phoques, and three others called Tchivirkouskie. There are many other small ones besides without names, and which are only frequented by fishermen and hunters, and then only at certain times of the year.

The navigation of the lake is very dangerous, on account of its numerous rocks and reefs. It is much subject to bad weather, and the boatmen are careful not to expose themselves when the weather is threatening to Northward. The lake is so deep that even close to the shore the lead does not find bottom at 150 fathoms, and at a distance from it there are parts where no bottom has yet been found.

The water of the lake has a periodical rise, which has some analogy to the tides of the sea. It abounds in fish, even to sturgeon, of which it is reported to have plenty. The sea sponge is also found there, forming an important branch of commerce to the people of its shores. The water of the lake is very pure and fresh, a circumstance which admits of whole forests of trees, which were formerly above water, being plainly visible at a great depth in it, and the mountainous ground on which they stand. The phenomenon which is the most curious of any presented by this interesting part, is that vegetation continues to florish under water most magnificently. The trees, instead of perishing, continue to increase every year.

Baikal is surrounded by high mountains, and is the receptacle of a great number of rivers. Among the most considerable are the Bargousine, the Selenga, the Snejania, the Slioudereka, the Boulkaia, and above a hundred minor streams and torrents, formed by inexhaustible sources in the mountains. The lake, notwithstanding the great quan-

tity of water which it receives, has no other outlet than the River Angara Inferior, which, from close calculations, diminishes in respect of the quantity of water in it rather than increases. A kind of bitumen is cast on the borders of the lake here and there by the water, to which the name of mountain tar has been given, and which is used as a cure by the people for certain maladies.

The lake is not generally frozen until Christmas, and is open again the May after, having a surface of many miles of sheer ice. When it is not frozen it sometimes undergoes some extraordinary movements: its surface is violently agitated in a light breeze and when the wind is strong it has no effect on it. It sometimes undergoes an internal ebullition, and again, although the surface may be quiet, the vessels on it undergo a heaving motion fore and aft. In bad weather waves have been seen to rise to the height of 200 feet. The lake has been formed by a volcanic subsidence in the same manner as the Caspian Sea. It presents a series of extraordinary phenomena, which for some years have been the subjects of observation, among which are those above-mentioned.

Cape Comorin.

The continent of India is terminated in the South by a fine headland or cape, on one side of which (that of the Indian Ocean) is the Malabar coast, and on the other (the Gulf of Bengal) the extremity of the coast of Coromandel. The natives give to this cape the name of Kamari or Kanyamure, and it is known all over the world by the name of Cape Comorin. It stands at the entrance of the Gulf of Manaar, and near to Palk Strait, which separates the Island of Ceylon from the continent.

Cape Comorin also terminates the immense chain of the Ghauts. These mountains, which extend throughout the whole surface of India, are divided into two distinct branches. The first comprises the western Ghauts, which extend from the sources of the Godvery to Cape Comorin; and the second, the eastern Ghauts, which cross different provinces and stop at Krichna. These two branches have each several important ramifications, the principal of which are the Neilgherry Hills, the Berar and the Vindhia Mountains. Recent explorations have shown that the great mountains of Ceylon are branches of the Ghauts, which from Cape Comorin are interrupted by a distance of several miles, occupied by the sea, thus presenting a curious geological phœnomenon in the physical constitution of the globe.

The summit of Cape Comorin is 4,592 feet above the level of the sea. It is formed by an extensive plain, covered with trees and meadows, across which a magnificent course of water falls into the

sea, forming beautiful cascades, and presenting altogether a picture of nature under one of her most splendid aspects.

This promontory, the most unique in the world is considered in the Indian theogony as the residence of the goddess Pauvati, who reigns over mountains. She has a temple here, constructed of marble, to which the natives from around make pilgrimages, and sacrifice to the deity. It is known in the country by the name of Kromari, from whence comes the name of Cape Comorin. She has also several other temples excavated in the rock, in which pilgrims make their stations. On one of the most picturesque hills of the country is also seen the little church which St. Francis dedicated to the Virgin in 1550, two years before he died. Two priests, much beloved by the natives, keep it in order and perform the office of worship. This church, surmounted by a stone cross, is conspicuous from the sea, but Cape Comorin is surrounded by rocks and numerous dangers which render it difficult of access.

The Malabar or Malebar country, which now forms a district of the Madras Presidency, extends from Tovela, near Cape Comorin, as far as Cape Dilly. It is bounded on the East by the Ghauts, and on the West by the sea. It was formerly an independent country of great importance.

The coast of Malabar has undergone numerous physical revolutions, of which it yet bears traces. Thus it is now ascertained that the Isle of Vapi, situated to the North of Cochin, has been separated from the land. The natives state that the waters, which in the rainy season come down from the Ghauts, in 1341 burst the dykes of the River Cochin, and rushed with such violence that they destroyed a town and formed an island, a river, a lake, and a port capable of receiving the largest vessels. Up to the present time every year presents extraordinary phœnomena. In the months of August and September the water washed away entire hills of sand. Again, the torrents from the hills and the sea seemed to strive against each other. When these torrents, the effects of the rains, are in full force, they open a course for themselves and clear the strand of the sea of those obstacles which are thrown upon it. It also rolls back into the interior, forming rivers, ponds, lakes, water courses, islets, and fields of new ground, and the natives, in the midst of these contentions of nature, are obliged to retreat as fast as possible.

The Malabar coast is inhabited by Hindoos, who have preserved all the traditions and customs of the primitive race. Their religion, as to practice, differs essentially from that of the natives on the banks of the Ganges. Their manners are also very different from those of the other people of India. The nobles are hereditary among them, and call themselves Nairs; and a large number of the princes who descend from the caste of the warriors are called Tchatrias or Naiaques. An odd custom that has been preserved among the Nairs, and which seems to be proof against the inroads of time, consists in the right which these ladies have (though they have each a husband) to invite to their bed, at the time of certain feasts, any individual male among

the nobility, the husband having no power to prevent it. But if a lady admits that liberty to an individual of another caste, they are both burned alive. Formerly the women of Malabar burned themselves at the tombs of their husbands. The English have put a stop to this barbarous practice, which is only found in some parts of the interior of the mountains, where improvements have not yet penetrated. Sometimes widows who reside on the coast, and are under the immediate surveillance of the English authorities, retire to a village of the Ghauts celebrated for the observance of this barbarous practice, taking the embalmed bodies of their husbands with them. The funeral pile is there formed: on which they mount, amidst the plaudits of a stupid and fanatical crowd. This was done in 1853 by the widow of one of the most esteemed and richest natives of Calcutta. She went to Baravay, some miles from that place, where there was an Indian temple, built in the fifteenth century, and in the presence of the priests and the whole population, with their shouts and plaudits ringing in her ears, she threw herself in the flames on the body of her husband.

The Malabars are not so deeply coloured as the Tamoals; the darkest are the Maquois, or fishermen, and the Paravas, or weavers, of the coast. The inhabitants of the mountains and plantations and those on the banks of rivers are the whitest.

A race of Israelites, called white Jews of Cochin, has been attracted by the charms of commerce into the country. They pretend to have been there before the common era, and to have formerly possessed a little kingdom governed by the princes of their religion.

Malabar is a rich country: the produce of its soil consists of the most estimable articles of commerce.

The Report on the Danube.

The *Moniteur de la Flotte* says:—

The imperial paper has just published the report of the International Commission at Paris on the question of the improvement of the mouths of the Danube. This important report, of 98 pages quarto, with a superb chart, is signed by the four commissioners of France, Great Britain, Prussia, and Sardinia,—Messrs. Albert Tostain, Fowke, Lantze, and L. F. Menabrea.

In point of an historical production it does honour to those who have composed it, for it contains the solution of a most important question, which affects the commerce of the whole of Europe. To direct the course of the Danube, and by skilful works to render it easy of access and egress to ships of all nations, is to set at rest now and for ever all questions of strife and usurpation that might disturb the peace of the world. By the aggregation of a variety of circum-

stances, all of them most complicated and all of a most delicate nature, the Danube for half a century had gradually been deprived of that principle of free navigation which was established at the congress of Vienna. The treaty of Paris of the 30th of March, 1856, has found a remedy for this intolerable state of things, and will not be one of the least important results of the victory gained by the combined armies of France and England. Such was the technical question which had to be solved by the Commission of the mouths of the Danube, and such is the object of the remarkable memoir which we will now analyse.

After some preliminary introduction to the existing state of things, and on the previous works of the European Commission at Galatz, the memoir treats successively on the following seven points:—

1.—It gives hydrographic surveys of the lower Danube, made with an accuracy which establishes an invariable law in such matters as to the future. It determines the limits of the river navigation, and shows the different arms into which it separates, the origin of the delta, the river in its different states, the length and superfices of the delta, the nature of the soil, and, lastly, the population, which does not exceed 6,000 people, and the half of which inhabit the only town of Sulina.

The report considers successively the different branches and mouths of Kilia, Toultcha, St. George, and Sulina, the formation of bars, the prevailing winds, and the set of the current along shore.

2.—In the second chapter the Commission considers the actual state of the navigation, the taxes upon it, and the improvements of which it is susceptible in an economical point of view.

3.—To these general points of information, deduced from fact, succeeds the opinions and former projects of Messrs. Hartley, Nobiling, Wex, and Richratt.

4.—The several projects are discussed in their turn, particular stress being laid on that of Mr. Hartley, the Chief Engineer of the European Commission.

5.—The fifth chapter is the most important of the whole memoir, being that in which the commission decides on the St. George branch, stating the reasons for their choice.

6.—The chapter following it treats of the tolls to be established for defraying the expence of executing the proposed works.

7.—The last chapter takes a general review of the different subjects discussed throughout the memoir, and gives the conclusions arrived at.

The concluding advice of the commission is thus, as we have already observed "to adopt on all accounts the St. George arm for the navigation of the lower Danube." The opening of a canal independent of the actual course of the water, with one or more sluices, is the only means of removing the difficulties of the entrance. The depth of the canal kept at sixteen feet will admit of its navigation by ships of 500 tons. The channel of the river will be improved after that of the entrance is effected. The breadth of the canal at the

surface will be 164 feet. The jetties of the canal seaward will take the natural direction of the coast, being nearly East and West. The northern jetty will be prolonged 500 feet beyond the other, and will rise from the depth of 23 feet. The jetties will be from 1,000 to 1,300 feet across, to give room for landing, and will be of stone *en enrochement*, the end of it being distinguished by a lighthouse. The works will cost £500,000, and the tax will be established at 2s. 6d. the ton.

The foregoing is a tolerable analysis of the report of the Commission, and we consider the proposed improvements, clear as they are to the members of the Commission, are easy to carry out and will render an immense service to the navigation of the Danube.

If our readers remember what we said recently on the excellent report of M. Paleocapa on this question, they will see that the course recommended by that excellent engineer is in every respect similar to that arrived at by the Commission. M. Paleocapa adhered to the St. George branch, giving the most convincing reasons for his choice; and this branch the Commission has selected, an agreement which forms a powerful guarantee of the justness which has guided the Commission.

This great question of the improvement of the Danube's mouth may now be looked upon as finally set at rest. The several European powers have a common interest in it, and they know well how to take measures in earnest adapted to satisfy the legitimate objects of their commerce and their navigation of the great river.

THE BURNING OF THE STEAMER "AUSTRIA."

The following detailed statement of Mr. Alfred Vezin, of Philadelphia, one of the first-cabin passengers, who lost his mother and two sisters by the disaster, gives full particulars of the catastrophe:—

Mr. Vezin's first intimation of danger was about two p.m., when several of the second-class passengers rushed towards the stern of the boat, crying "Fire, fire!" He was engaged at the time in a game of shuttlecock with some of his associates, who, with himself, were at first inclined to believe that the alarm was false. On looking round, however, they saw a dense volume of smoke issuing from the main hatchway, which did not materially change their opinion, as they concluded the smoke was caused by a back draught in the smoke-stack.

Mr. Vezin, with a few others, immediately attempted to allay the fears of the excited women and children, but without success; for scarcely fifteen minutes elapsed from the time of the alarm before the flames darted out from amidships, in the vicinity of the wheelhouse. Scarcely twenty minutes after the fire broke out all communication

from the after part of the ship, where Mr. Vezin was, to the fore part was prevented by the fire. Thereafter all discipline was ended, the captain and fourth officer being among the foremost to follow the instinct of self-preservation by endeavouring to enter the boat which some of the frenzied passengers had attempted to lower. Owing to the inexperience of the majority of those engaged in this attempt, the boat, crowded as she was, did not reach the water successfully. The stern-tackle was let go by the run, and many of the wretched people were jerked out of her and never seen again. Captain Heydtmann, who had apparently lost all presence of mind after the announcement of the accident, was clinging to the tackle of this boat when the stern touched the water, and got on board of her safely. Presently the bow was lowered, but as the steamer was passing rapidly ahead—the engines were working at the time—the small boat was struck by the screw, stove, and all of those on board, it is believed, were drowned.

On the deck of the burning ship at this time the utmost confusion prevailed. Some men and women, palsied with fear, and aghast at the sudden calamity, made no effort to preserve themselves or their fellows, and only moved when the flames scorched them. Others of the passengers darted here and there—mothers seeking their little ones, husbands their wives, crying and imploring aid. An effort was made, however, on the part of the more self-possessed to extinguish the flames and alleviate the sufferings of those in the cabin. Every attempt to gain access below failing, ropes attached to tin pails filled with water were procured and lowered through the hatchway to the second cabin; little good was accomplished in this way. The pails were emptied before they reached the second deck, and every effort to secure the safety of the vessel was abandoned

The man at the wheel, shortly after the fire was discovered, deserted his post, and the ship sped through the waves head to wind, while showers of sparks and volumes of smoke were wafted by the breeze directly upon the large number of men, women and children who had collected at the extreme after part of the ship. Two sails at this time were observed at a distance—mere specks in the horizon, and "Ship ahoy!" was continually screamed by many of the sufferers, as though those on board could immediately answer their cries. One of these ships proved to be the French barque *Maurice*. She reached the wreck of the *Austria* in about four hours from the time she was first observed.

Mr. Vezin worked as long as he could at hauling up the passengers from the cabin through the skylight, and rescued six in this way. These reported that many lay below smothered by the smoke. His mother and two sisters, one nine and the other seventeen years of age, were standing near the stern when the flames first appeared, only a few feet from himself. He left to procure, if possible, life preservers for them. After a few minutes he returned with a tin preserver, but, on account of the press of women and children, he could not get nearer than ten feet to his family again. He called his mother, and

desired to throw the preserver towards her. She refused to take it, however, saying it would be of no use, and she must perish. The heat shortly became so intense that Mr. Vezin had to climb over the side of the ship, and he never saw his mother and sisters again. He clung to a rope which hung over the starboard side, where the first boat had been cut loose, and held on there, with his back to the flames, until his clothes were burned. At this juncture he saw a big black bag floating by, when he jumped into the water, and after swimming some five minutes he reached it. It was filled with cork, doubtless by some one of those on board, who in some mischance had lost it. With this he floated for about four hours, when he was picked up by a boat and taken on board the *Maurice*.

Mr. Vezin states that the capacity of the *Austria's* lifeboats was entirely inadequate for the number of passengers. There were four metallic lifeboats forward, and four wooden boats aft, but one of the latter was burned before the tackling could be cut. The boats were chocked, and those who cut the tackling loose did not understand how to lower them. They fell down with a crash, precipitating those on board into the water, and smashing themselves by coming in contact with the propeller. One boat contained fifteen or twenty women, who were all drowned.

Mr. Hoxie, of New York, formerly a merchant, who has been absent about five years, and whose wife died in Italy a short time ago, got into one of the wooden boats at the after part. This boat was left so far behind that the French barque lost sight of it, although she sailed about in the vicinity of the catastrophe all night.

Mr. Vesin thinks that the *Austria's* engines worked fully an hour after the fire broke out, and believes the engineers died in their engine-room. He heard an explosion while he was in the water, which he assumed to have been a keg of powder. It was not very loud. He was one of the last to leave the after part of the ship. He saw at one time four or five gentlemen hanging to a rope over a propeller. Through fatigue they slipped off one by one, were drawn under the screw, and perished. After Mr. Vezin had been picked up by the small boat he saw Mr. Theodore Eisfield in the water. Mr. Eisfield was nearly drowned, just gasping for breath, when he was taken on board, transferred to the *Maurice*, and proceeded in her to Fayal. The *Austria* was poorly supplied with life-preservers; only six, according to Mr. Vezin, had been placed in the aft part of the ship, and the passengers, before they leaped into the sea, provided themselves with whatever buoyant articles they could procure. Many of the ladies waited until their clothes took fire before they jumped overboard, while some, in parties of two and three, and sometimes more, clasping each other's hands, threw themselves into the water, when they would rise, but quickly disappear again in the ship's wake. Other women stood hesitatingly, until scarcely a particle of clothing was left on them, before they dared to leap the twenty feet which separated them from the waves.

Mr. Vezin says the foremast fell about fifteen minutes from the

time the fire occurred, but the mizenmast stood until late in the evening.

Soon after he reached the *Maurice*, a boat containing the first and second officers, some passengers, and seamen—in all about twenty—came alongside. Some of these stated that from fifty to sixty people were hanging to the chains at the bow of the ship. It was nearly dark then, and when the *Maurice* visited the wreck the next morning not a living soul was to be seen. Two corpses were hanging in the martingale chains—one that of a man, the other a woman's—with ropes about their necks, which had probably slipped in that position from their waists, to which the fastenings had been attached.

On board the *Maurice* every attention which humanity could dictate was given to the passengers; those who had no clothing were freely supplied with the best that the scanty wardrobes of the captain and crew could furnish.

The morning succeeding the disaster, twelve of the passengers, including Mr. Vezin, were transferred to the barque *Lotus*, and taken into Yarmouth (N.S.). A ship arrived at Halifax during his stay there, which reported that the smouldering hull of the *Austria* had been seen by her on the 15th—two days after the disaster.

There are supposed to have been 560 persons on board, and they may be classed as follow :—

Known to be saved	68
Lost, whose names are known	103
Lost, whose names are unknown	389
Total	566
Total number lost	492

New York Times.

WHALING AND WHALING GROUNDS.

The opinion is prevalent that the whale fishery in the North Pacific must soon cease to be profitable, from the constant destruction of so many whales as are annually killed. It is supposed that the number destroyed in this ocean alone amounts to three thousand each year. However plausible this theory may be, the annual decrease appears, from the observations of shipmasters, to be quite immaterial. The average catchings of the ships which have returned to port would appear to confirm this, for the average this season is rather better than last season, and varies but little from that of the past four years.

Most of the ships comprising the North Pacific whaling fleet having arrived. We give in this issue a summary of the season's work. Our table has been carefully revised and errors corrected, and will be found very complete. Some twenty or thirty vessels which were expected here this fall, are reported, some as bound to other parts, their north-

ern cruizes having been poor, while others are heard from as cruising on southern grounds. There will probably not be more than two or three arrivals from the North before the 31st of December.

The whole number of whale ships arriving at these islands has been 165, as follows:—American, 149; French, 9; Hawaiian, 3; Bremen and Oldenburg, 4. Of these 151 have been right whalers, and 14 sperm whalers and traders.

The amount of oil and bone taken the past season by 151 right whalers is 127,539 barrels of oil and 1,591,543 pounds of bone, as will be seen by the following table, which also shows the totals for previous years. The average quantity of oil for each ship (which includes American, French, Bremen, and Hawaiian) is 845 barrels, and 10,540 pounds of bone, which is an improvement over the average for 1856.

Table showing the number of barrels of Oil and pounds of Bone taken by the North Pacific Whaling Fleet for the years 1852–57, *including only Vessels that have returned to the Sandwich Islands, and the Average of each Season.*

Year.	Total No. Vessels.	No. Right Whalrs	Total on board.		Season's Catch.			Average.	
			Sperm.	Whale.	Sperm.	Whale.	Bone.	Whale.	Bone.
1857	165†	151	16,595	162,976	3,079	124,460	1,591,543	845	10,540
1856	177	170	9,013	195,255	3,337	135,708	1,523,650	830	9,015
1855	250	221	.. *	.. *	6,242	225,626	2,443,250	1,021	11,110
1854	245	232	.. *	.. *	4,276	191,843	2,698,180	827	11,200
1853	252	244	20,857	364,520	.. *	280,360	3,448,300	1,190	11,728
1852	275	271	17,247	421,585	.. *	337,124	5,357,737	1,244	15,815

Annual average for the last four years to each vessel, 880 barrels of oil.

Note.—The season's average of the North Pacific fleet is obtained by adding together the sperm and whale oil.

The weather at the North, during the past season, has been unusually favourable for whaling, although on each of the grounds more or less bad and foggy weather has been experienced. Two vessels have been reported as lost, the *Newton*, of New Bedford, and *Indian Chief*, of New London. It is feared, however, that the *Caravan*, of New Bedford, which was last reported in April with loss of topmasts and in a leaky condition, will be added to the list. She was then bound to the Ochotsk, but has not been heard from by any of the ships arriving here from all quarters of the North Pacific. It is still hoped that she may have put into some port for repairs.

Very few accidents have occurred during the past season, and the repairs required on vessels have been less than for several seasons past. A number of ships are having their bows covered with oak plank, as an extra protection against the ice. In former seasons the loss of anchors caused a heavy bill of expense, but during the past

* No report is obtainable for these years.

† This number will probably be increased by December 31st.

summer very few anchors have been lost. We have heard of but four or five anchors lost.

By frequent conversations with captains, we have learned some facts in regard to the different grounds, which, will, perhaps, be worth recording.

Right whales are found on the *southern* part of the sea, and *bowheads* are found in the *North* and *western* part of it at the same time.

Bowhead whales are found and captured in the Arctic Ocean as soon as the ice breaks up, which is usually in June until October.

The right whale is a cold water fish. It has been found by the examination of "records kept by different ships for hundreds of thousands of days, that the tropical regions of the ocean are to the right whale as a sea of fire, through which he cannot pass, and into which he never enters."

It has also been supposed, that since the right whale does not cross the torrid zone, which to him is as a belt of liquid fire through which he cannot pass, that therefore "the right whale of the northern hemisphere is a different animal from that of the southern."

It is, however, a well established fact, "that the same kind of whale which is found off the shores of Greenland, in Baffin Bay, &c., is also found in the North Pacific and about Behring Strait; the inference therefore is, that there must be an opening for the passage of whales from one part of the Arctic Ocean to the other."

The following facts are taken from Maury's recent work on *The Physical Geography of the Sea*, and cannot fail of being interesting to whalemen, and indeed to all classes of readers.

"It is the custom among whalers to have their harpoons marked with date and name of the ship; and Dr. Scoresby in his work on *Arctic Voyages*, mentions several instances of whales that have been taken near Behring Strait side with harpoons in them bearing the stamps of ships that were known to cruize on the Baffin Bay side of the American continent; and as, in one or two instances, a very short time had elapsed between the date of the capture in the Pacific and the date when the fish must have been struck on the Atlantic side, it was argued, therefore, that there was a *North-West* passage by which the whales passed from one side to the other, since the stricken animal could not have had the harpoon in him long enough to admit of a passage around either Cape Horn or the Cape of Good Hope.

"Thus the fact was approximately established that the harpooned whales did not pass around Cape Horn or the Cape of Good Hope, for they were of the class that could not cross the equator. In this way we are furnished with circumstantial proof affording the most irrefragable evidence that there is, at times at least, open water communication through the Arctic Sea from one side of the continent to the other, for it is known that the whales cannot travel under the ice for such a great distance as is that from one side of the continent to the other.

"But this did not prove the existence of an *open* sea there; it only established the existence—the occasional existence, if you please—of a

channel through which whales had passed. Therefore we felt bound to introduce other evidence before we could expect the reader to admit our proof, and to believe with us in the existence of an open sea in the Arctic Ocean.

"There is an under current setting from the Atlantic through Davies Strait into the Arctic Ocean, and there is a surface current setting out. Observations have pointed out the existence of an under current there, for navigators tell us of immense icebergs which they have seen drifting rapidly to the North, and against a strong surface current. These icebergs were high above the water, and their depth below, supposing them to be parallelopipeds, was seven times greater than their height above. No doubt they were drifted by a powerful under current."

Dr. Kane reports an open sea North of the parallel of 82°. To reach it, his party crossed a barrier of ice 80 or 100 miles broad. Before reaching this open water, he found the thermometer to show the extreme temperature of —60°. Passing this ice bound region by travelling North, he stood on the shores of an iceless sea, extending in an unbroken sheet of water as far as the eye could reach towards the pole. Its waves were dashing on the beach with the swell of a boundless ocean. The tides ebbed and flowed in it, and it is apprehended that the tidal wave from the Atlantic can no more pass under this icy barrier to be propagated in seas beyond, than the vibrations of a musical string can pass with its notes a fret upon which the musician has placed his finger. These tides, therefore, must have been born in that cold sea, having their cradle about the North Pole. If these statements and deductions be correct, then we infer that most if not all the unexplored regions about the pole are covered with deep water; for, were this unexpected area mostly land or shallow water, it could not give birth to regular tides. Indeed, the existence of these tides, with the immense flow and drift which annually takes place from the Polar seas into the Atlantic, suggests many conjectures concerning the condition of the unexplored regions.

Whalemen have always been puzzled as to the place of breeding for the right whale. It is a cold water animal, and, following up his train of thought, the question is prompted,—Is the nursery for the great whale in this Polar sea, which has been so set about and hemmed in with a hedge of ice that man may not trespass there? This Providential economy is still further suggestive, prompting us to ask,—Whence comes the *food* for the young whales there? Do the teeming waters of the Gulf Stream convey it there also, and in channels so far down in the depths of the sea that no enemy may waylay and spoil it on the long journey? These facts therefore lead us to the opinion that the Polar Sea may be an exhaustless resource for the supply of whales for other seas, as well as a common rendezvous for them during the intense cold of Arctic winters.

The Kodiack Sea.—This favourite whaling ground, located nearest to the islands, is generally visited earliest in the spring, owing to the absence of ice. The vessels that visited it in 1856 having done well,

a larger number than usual cruised on it this season. It is thought that about sixty ships cruised there, and the average amount of oil taken by them is not far from 500 barrels. The *General Williams* of New London is reported to have been the first vessel on the ground, having arrived there early in March. The first whale was taken this season on the 10th of April by the *Emerald*, which took her second whale on the 26th of April. Most of the whales taken were killed during May and June, but they were at no time abundant, and appear to have left the sea by the 1st of July. During this month a few vessels left for these islands, but the greater part of them sailed for Bristol Bay, where they cruised for a few weeks and improved their catchings some 200 or 300 barrels. The largest whale reported to have been taken this season was captured by the *Emerald*. It was a fat male, measuring about eighty feet in length, and turned out 240 barrels.

The Arctic Ocean.—It was this whaling ground which made the North Pacific so famous for its fishery from 1850 to 1854. Those captains who have had the best opportunity for knowing, believe that the mild open sea which Kane discovered is the nursery of the whale; in which impenetrable resort they breed and thrive, unmolested by the attacks of the whalemen, except as they leave their fastness. It is not improbable that the food on which the whale feeds is produced in sufficient quantities in this polar sea to supply the vast numbers of whales supposed to exist there. The superior size of the Arctic whales would indicate that they have some secure resort where they are free from capture.

During the years 1855 and 1856, this ground was visited by only one or two straggling ships, which came away only to report disappointment and ill luck. This year, 1857, we hear of four ships visiting the sea, one of which, the *Indian Chief*, was lost. Three others, the *J. D. Thompson*, *South America*, and *Nassau*, took an average of about 1,100 barrels and reported whales very plenty, but the weather rough. Captain Walker of the *South America* reports that for three weeks he was obliged to lay to in a gale with reefed topsails, during which time he saw thousands of whales; and had he had one week of good weather he could have filled his ship. All the reports confirm the abundance of whales in the sea. Captain Walker cruised as high as 71° 30′ without meeting any serious obstructions from the ice. It is quite likely that the Arctic Ocean will next season be visited by a large fleet of ships.

The Ochotsk Sea.—This still remains the best whaling ground in the North Pacific. We have not yet been able to procure the exact average of the catch on this ground for 1857: but as near as we can estimate, it is over 900 barrels to each ship. The *India* and *Josephine* were the two first vessels on this ground, both arriving about the 25th of March. Ninety ships cruised in the Ochotsk. The ice is reported to have broken up unusually early, but no whales were seen till May, during which month a few were taken. The month of June was so foggy that little or no whaling was done. Most of the

whales were taken during July, and from that to the end of the season. In former years, July has been considered the worst month for whaling in this sea, but this year June was. In their resorts the whales appear very changeable. In some bays where last year they were abundant, this year not one was seen. Whales have been plenty in the sea, but not so much so as in former seasons.

On the whole, the season of 1857 will be considered as a good one. Though the average of oil taken is only about the same as for 1856, yet the high price which bone has reached, and which will probably be realized for most of this season's catch, will make the returns for 1857 fully equal to those of any former year. Add to this the fact that few accidents have occurred, while the expenses of ships in port have been comparatively light, owing to the abundant supply of all kinds of recruits, some of which have been furnished at lower prices than could be had in New Bedford, and also that exchange has been comparatively low, and it will be conceded that the whaling season of 1857 is one of the best on record.

The report which was brought to the islands in September, by the schooner *San Diego*, that the Russian authorities had forbidden the whale fishery in their waters proves to have been premature. None of the captains with whom we have conversed heard any such report, though several of them had been into the port of Ayan, where the Governor resides, which is a station for Russian war vessels. On the contrary, a number of whales were taken by several ships in that harbour, without any remonstrance from the authorities. It is possible that the Russian Government may have entertained the project of forbidding the whale fishery in their bays, but it will not be likely to enforce it without first giving official notice to the French and American Governments.

Whaling Grounds.—The following embrace all or nearly all the prominent localities which are familiar to whalemen as whale grounds:

The Charleston Ground; Brazil Banks; Tristan d'Acunha Islands; Indian Ocean; Sooloo Sea; New Holland; New Zealand; Kings Mill Group; Japan and Japan Sea; Peru Coast; Chili Off Shore Ground; California; Kodiack; Ochotsk Sea; and Arctic Ocean.

Whale Seasons, and the Places where Different Species of Whale are Found.—Sperm whales are taken in the North and South Atlantic Oceans in every month of the year.

Sperm whales are taken on the coast of Chili from November to April; and on the coast of Peru in every month of the year. In the vicinity of the Galapagos and Kings Mill Group, sperm whales are found.

On the coast of Japan, they may be taken from April to October. They are also taken off New Zealand and Navigator Islands from September to May.

From November to March there is good sperm whaling South of Java and Lombock. In June and July sperm whales may be found

off the N.W. cape of New Holland. March, April, and May are considered good months for sperm whaling off the Bashee Islands, but ships are obliged to leave this ground after that time in consequence of typhoons.

From March to July there is good ground for sperm whaling in the Sooloo Sea, to the West of the Serengani Islands. In the same months sperm whales are found off Cape Rivers and Canda, close in to land.

In the Mollucca Passage there is good sperm whaling the year round, the best months, however, are January, February, and March.

The English whalemen have taken, in years past, a large number of sperm whales in the Red Sea.

The area over which sperm whales roam may include the immense space of the ocean or oceans included between the parallels of 30° and 50° of latitude on both sides of the equator. "The sperm whale is a warm water fish," and, according to the opinion of Maury, though it "has never been known to double the Cape of Good Hope, he doubles Cape Horn."

Right whale season off Tristan d'Acunha is from November to March; and from January to March off Crozettes and Desolation Islands. Sperm whales are seldom seen near these islands.

Right and sperm whaling off the South coast of New Holland from October to March.

In August there is good ground for humpback whaling around the Rosemary Islands. Right whales are taken in the Japan Sea from February to October, but bowhead whales have never been seen there.

Right whales are taken on the Kodiack Ground from May to September; and from March, or as early as the sea is free from ice, until November, in the Ochotsk Sea. Dr. Kane found the temperature of this polar Sea only 36°!

Vessels that are fitted out for the purpose of whaling, whether for sperm or right whaling, and the time for which they are fitted, may be classed as follows:—

1. Small vessels, principally schooners, though barks and brigs are included, cruise in the North and South Atlantic Oceans. They are fitted for six to eighteen months, and even two years.

2. Ships and barks that cruise in the South Atlantic and Indian Oceans, are usually fitted for two to three years.

3. Ships and barks that cruise on the Peru Coast or Off Shore Ground are fitted for two to four years.

4. Ochotsk Sea and Arctic Ocean whalers are fitted for two, three, and four years.

5. New Zealand whalers, sperm and right, are fitted for two, three, and four years.

The Time when Whaling Vessels Sail to their Respective Whale Grounds.—Ships and barks fitted for the North Pacific, the Ochotsk Sea, the Kodiack, and Arctic Ocean, usually leave our ports in the fall of the year, so as to make the passage of the Horn or Cape of

Good Hope in the southern summer. These ships will arrive at the Sandwich Islands in March or April, remain in port a week or two, recruit, and sail to the North. On their return from the North in October and November, and sometimes as late as December, they usually touch at the islands again, take in a fresh supply of provisions,—it may be ship their oil home,—and sail to some other whale ground in a more southern latitude, either for sperm or right whaling, or both, and continue this cruise until the season comes round for them to go to the North again. The first is called the "regular season" for whaling, and the second "between seasons."

Ships that have completed their voyages and intend returning home, when they leave the Arctic or Ochotsk generally touch at the islands or some other intermediate port for recruits, and arrive on our coast some time in the spring months, and even as early as February or March, though not generally.

The great majority of the ships sail in the autumn, and the largest arrivals are usually in the spring.

The length of a whale voyage is determined by the number of seasons. One season in the Ochotsk or Arctic, including the outward and homeward passages, consumes one year and a half. Two Seasons at the North, including the passages and two "between seasons," will require three years and a half.

Sperm whalemen, who are not governed by these seasons and between seasons as right whalers are, are absent from home three and a half and four years, and sometimes longer. Indeed, the success or ill-success of whalemen in obtaining oil, determines essentially the length of voyages.—*Vineyard Gazette.*

The Ballad of the Whale.

By Read Thornton.

The Northman lay on his iron cliff,
Outlooking the Norman sea;
With his bold, blue eyes of wild emprise,
Abroad o'er the wave looked he.

In a restless mood of solitude,
He longs in the chase to roam:
"I've conquered the bear in the Tornean wood,
And the shark by the deep Maelstroom!"

"My fitting foe lived long ago—
The mighty mastodon!"
His blue eyes bravely glanced below—
The chief from his cliff had gone!

'Tis the whale; yon whale that tempts his sail,
Like an island he moveth on—
"By the boundless sea, I'll conquer thee,
Thou ocean mastodon!"

He darted his skiff from the foot of the cliff,
All armed with corded spear;
Soon the barb is dyed in the sea beast's side,
And away to the West they steer.

With hempen rein, o'er the ocean plain,
More fleet than the sledge they go;
With the red setting sun a race they run,
In the road of its ruddy glow.

And the storm-waves keep up a glassy calm,
That strange first bark to see;
And the sea-gods rose the chase to charm,
And shouted—"We'll ride with thee;"

And one of their troop the Norman chose,
To share in his daring deed;
White was her breast as the Finland snows,
Her heart like the brown sea-weed.

And thus they twain o'er rode the main,
And the Norman's shirt of mail,
With his shield he clashed, as they land-way washed,
Till he stranded the maddened whale!

That night on the strand of Owhyhee's land,
He built for his mermaid bride
A bowery hut, and the oil he cut,
For a lamp from the monster's side.

And from these two there sprang a crew,
The boldest to spread the sail;
And on every plain of the stormy main
They chase the tumbling whale!

Passages Between England and Australia.

The following is a summary of passages out and home between England and Australia, and the average duration of voyages in the years 1856 and 1857. The shortest have been made by ships of the largest tonnage.

To Victoria, South Australia, the shortest voyage was made in 68 days by two ships from London of above 1,000 tons, and the longest was one of 144 days by a ship of 426 tons.

To Sydney, the quickest passage was made in 74 days by a London ship of 1,500 tons, and the longest by a vessel in 168 days, although an exceptional case.

The runs homeward are from Melbourne and Sydney 70 days.

The returns ftom which the passages are given tend to show that ships of large tonnage, as might be expected, possess, with but few exceptions, great advantages over smaller vessels, although much de-

pends on the skill and ability of the commander. In nearly every case London ships have proved the swiftest, but Liverpool can boast of despatching some of the finest,—one of them, registering 2,143 tons, running out to Sydney in 75 days.

London to Victoria.

	Ships.	Tonnage.	Average Tonnage.	Av. Pass. Days.	Longest, Days.	Shortest Days.,
1856	108	89,197	826	102¼	129	71
1857	127	110,663	871½	102¼	144	68

Liverpool to Victoria.

1856	76	93,492	1,236	94	130	69
1857	99	125,885	1,272	94½	142	71

Victoria to London.

1856	24	17,666	736	92½	123	81
1857	30	23,903	797	97½	124	70

Victoria to Liverpool.

1856	20	26,535	1,327	90½	128	75
1857	18	32,278	1,793	100½	138	76

London to Sydney.

1856	69	59,871	867	103½	144	74
1857	73	62,949	862	105¼	145	83

Liverpool to Sydney.

1856	20	19,555	977½	109 7-10	168	75
1857	28	23,129	822½	113¾	153	86

Sydney to London.

1856	38	29,155	767	107	146	79
1857	29	26,664	919	98¼	126	70

Another Wreck on the Pratas.

We are sorry to hear of the wreck, on the Prata Shoal, of the fine American clipper ship *Courser*, of 1,027 tons, Cole master, with teas from Fuhchau to New York. The vessel left Fuhchau on the 2nd of April, and on the 4th, about 9.30 p.m., while the captain supposed he was in mid-channel betwixt the shoal and the main, breakers were heard ahead, and before the ship could be put about, she struck heavily near her forechains, and instantly began to fill, so that in two hours she had six feet water in her. The captain, officers, and crew got into their three boats, and made for Hong Kong, but fell in with some junks, which they took to be fishermen, until the junks opened fire upon them. Being well armed, the mate dashed alongside a junk, from which stinkpots were thrown into the boat, and on the crew endeavouring to avoid them, the boat was capsized, and two seamen

drowned; but the mate and nine men, after being stripped of everything, righted the boat, baled her out, and arrived here this morning. The other two boats were seen making off, and are supposed to have gone to Macao. The wreck lies on the N.W. point of the Pratas. We hear that there is a proposal to send a steamer to salve the cargo; but the agents will have to be quick about it, or the Chinese wreckers will forestall them.

Orders, we hear, have at last been received from home for the immediate survey of this fatal shoal and the erection of two lighthouses upon it.

The second mate of the *Courser* arrived in the harbour on the afternoon of the same day, (April 8th,) with his boat's crew; and the *Fei-Má*, on her way to Macao, picked up the captain and his men; so that only two seamen are missing—those drowned alongside the pirate junk when the mate's boat capsized. Captain Cole also fell into the hands of pirates, who at first plundered his boat of everything, but afterwards gave back the ship's instruments, put a little rice into the boat, and allowed them to depart. The poor fellows were completely exhausted when the *Fei-Má* fell in with them, so much so, that some of them could not walk, but had to be helped on board the steamer. A hearty meal, instantly provided by Captain Castilla, brightened them up a bit; and a subscription of seventy-eight dollars, to which some Chinese passengers contributed, was given to them.

The following is Captain Cole's account of his adventure after leaving the mate and before he fell in with the *Fei-Má*:—

The two remaining boats were chased all night by the pirates, and escaped only by dodging in the darkness. Next day we got inside the Great Lama. When the second mate's boat was ahead, a junk fired on us and sent a bullet close by my head. We were compelled to go alongside, and then the Chinese threw stinkpots, and jobbed at us with their spears. Without, however, actually resorting to further violence, they contented themselves with taking all the money, baggage, and instruments in the boat, and with threatening to murder us. The steward had a ring, and they were about to cut his finger off in their anxiety to secure it. The Chinese finally gave back the instruments, and put a small quantity of rice into the boat, allowing us to depart.—*China Mail.*

METEOROLOGY FOR SEAMEN.

We have full often had occasion to find fault with our countrymen,—to point out their peculiar dislike to change even to improvement; their determined blindness to the future and their proneness to pursue the same beaten road, to follow the same contracted views as their forefathers, because *they* considered them sufficient;—forgetting

that the world is a race ground, the treasures of it the objects of man everywhere, but that the nearest way to them should be where civilization and science most abound. That our seamen are full of prejudices is a common observation, realized more and more the further we look back into the book of time; and yet who is more enterprising when deeds of daring are to be performed? But in works of science and art how far are they left behind! Nay, such is their apathy or want of energy that they will not turn aside to adopt the productions of science itself applied to art if they should interfere with old habits. It is difficult to imagine that the instrument which in these days, next to the compass, is the seaman's dearest treasure on the ocean, that invaluable reflecting instrument which gives him his position where water and sky with its gems of night and day are only visible, enables him to detect its currents, to assign the place of islands, banks, reefs of rock, and the shores of distant lands,—that this lay neglected for years after its invention because he had been accustomed to another rude means of navigating the ocean, which compared with it would bear about the same value for its purpose as the semaphore to the electric wire. But as this has displaced the former owing to its own inherent merit, so has Hadley's quadrant long superseded the use of the backstaff and all its brethren, and the prejudice of seamen for their favourite ways, has left such primitive machines for treasures in the way of instruments, that he may well be expected to appreciate.

Still, "onward" is the word in the road of improvement. There are many other sciences which concern the seaman in navigation as well as astronomy, and to these he must attend if he is not to be left behind in the race in which he too must take his part.

Among these is one remarkable for its modest, unpretending character; obtruding itself on no one, but quietly passing along the stream of time in close company with him, and yet affording him an occasionally attractive glimpse of the treasures it contains, and occasionally, too, forcing them on his attention by its displays of a terrific form. In the calm and placid atmosphere, when all nature is smiling with delight, or in the full gale of the impetuous hurricane, when she is writhing under its tremendous powers, such is meteorology.

And to meteorology at sea, thanks to the conference of Brussels in 1853, we have at length been urged to turn our attention. Some few of us from pure self-gratification have looked into it here and there; but the every day facts which, collected from all parts, sifted, grouped, or, in the word applied to observations generally, "reduced" and compared with phenomena continually transpiring in connection with them, were all allowed to pass unobserved, for such observations did not suit the taste of the multitude. There is no doubt that the votary of science will watch and observe in spite of difficulties; and so it has long been with meteorology at sea: partial observations have been recorded to show, as it were, like occasional solitary lights, the utter darkness which prevailed on the subject.

But all this has been changed, never mind how, although it would have been pleasanter if the retrospect could have presented a picture of

energetic self-exertion, taking the lead in plunging into the labyrinths of a science so important to society at large, and setting an example to countries less gifted with the means of carrying out a scheme of observations on so large a scale as happy England. As in deep sounding, so in meteorology we have been second in the field, and that too not with our own good will. Our "cousins" across the water—those fast people, whose motto is onward, and progress their aim—have been doing all this for us; but at length we can boast in full working order our meteorological instruments in many parts of the world, afloat and ashore, with ready hands and good heads at work recording observations; and what is still more, we have an office at home to receive them, at the head of which is a British Admiral, known to science, a tried man, with a staff of workmen to reduce them. What if we have been urged on to all this: we shall do the work we have been so loth to take up, and well too. The director of the meteorological branch of the Board of Trade has his work at heart, and we have before us the annual produce of his means, for his staff is as yet but limited in comparison with the extensive nature of those several branches of inquiry which must command his attention.

Previous to the formation of the office now held by Admiral Fitz Roy, the Government consulted the Royal Society as to the great desiderata in meteorological science, and which of the great atmospheric laws it would be most desirable to develop. Such questions naturally called forth that irresistible display which might be expected on the part of the savans, not only of this but other countries; showing those great questions, how best they should be treated, and the best means to be employed, along with a piece of encouragement not to be lost sight of, the opinions of eminent men on the subject at Berlin, Münster, Vienna, Washington, and Brussels. How could England, the encourager and promoter of science, hold back after this?

The work is begun, and the powerful aid of this country, employed as it is in many parts of the world, will do much in contributing to the harvest of results great facts, valuable and important truths in science. We have had "curiosities" of all kinds except those of the atmosphere; we shall now open out some of those mysteries in the hitherto sealed book of meteorological secrets, and turn them to account as we do everything else when we get fair hold of them. But we must not be impetuous,—we must not rush to ruin in fastening on conclusions which may prove to be but of the ignis fatuus order,—for they will leave us in the mire, and if we allude to meteorology, we must never forget that the tortoise won the race.

But we are running beyond our prescribed bounds. We have been unintentionally neglectful of this important addition to our national undertakings, and were anxious to lose no more time in recording the promise of goodly fruit which it holds out in due season. Another number will serve for a consideration of its early steps and present progress.

Nautical Notices.

THE GRANGE ROCK,—*Coast of Labrador, Gulf of St Lawrence. Ship struck.—Compass Bearings.*

An account has lately appeared of a dangerous isolated sunken rock in the Gulf of St. Lawrence, that appears to have been discovered on the rocky coast of Labrador by the Quebec and Liverpool steamer *America*. The following account of it has been transmitted to us by Mr. Findlay, and we have deduced its position from it as being lat. 50° 6½′ N., and long. 60° 20′ W., about three miles from the outer Wolf Islet, bearing N.N.E.½ E. We therefore caution vessels to give that dangerous part of the coast a berth of at least four or five miles, for considering its ragged nature, there may be other off-lying dangers besides this, of which they will do well to keep clear. The following is the account to which we allude.

53, *Fleet Street, October* 21*st*, 1858.

Sir,—I forward you the notice of a dangerous rock hitherto unknown off the South coast of Labrador. It was touched on by the screw steamer *North America*, under the command of Mr. W. Grange. "Monday, September 27th, 1858, a beautiful clear day, with very smooth sea; noon, latitude observed 50° 4′ N., long. 60° 40′ W.; steering S.E.b.E. ½ E. (true East); at 1.30 p.m. had the outer islets Wolf Island fair abeam, three to four miles distant, and very nearly in line, bearing N.N.E. ½ E.; the ship struck on a sunken rock. The first cast of the lead after she was clear, was 10 and then 12 fathoms."

The fine survey made by Rear-Admiral Bayfield shows the S.W. Breaker at two and a half miles [? ED.] northward of the position assigned by Captain Grange, the bearings of which cannot coincide with that of the latter. Near the spot a depth of 47 fathoms is marked, and therefore this rock is most dangerous.

Yours, &c.,

A. G. FINDLAY.

To the Editor of the Nautical Magazine.

WOOSUNG RIVER, SHANGHAE,—*Alterations of Buoys.*

In place of the Buoys laid down to mark the channel in crossing the bar at Woosung, two Boats have been moored in the following positions:—

The boat painted *White* and flying a white flag, lies in 14 feet at low water, spring tides, on the Western extremity of a shoal spit which makes off from the Eastern shore. It is 1½ cable's length from the shore. The White House in Mr. Henderson's garden, bears from it S. 20° E.; Messrs. Jardine. Matheson, and Co.'s Coal Godowns S. 21° W.; and the Woosung Joss Poles N. 25° W.

The boat painted *Red* and flying a red flag, lies in 12 feet at low water, spring tides, on the Northern extremity of the Lower Middle Ground. The White House in Mr. Henderson's garden bears from it S. 18° 30′ W.; Messrs. Jardine, Matheson and Co.'s Coal Godowns S. 77° W.; and the Upper Bar Creek open N. 88° E., distance 5¼ cables. It is 2¼ cables from the nearest part of the Eastern shore, and between it and the Receiving Ships, which lie on the Western side, the ground is very uneven, and in several places very shoal, many spots having as little as 9 feet at low water.

It is recommended that vessels proceeding up the river should pass close to the *White Boat*, leaving it on the *port hand*, and after passing it steer for the *Red Boat*, leaving it well on the *starboard hand*, and gradually approach the Eastern shore to a ship's length off the Upper Bar Creek.

The Red Boat should not be brought to the Eastward of S. 60° E. The boats bear from each other S. 52° E. and N. 52° W., distance 4¼ cables; least depth of water between them, 13 feet at low water, spring tides.

GEO. L. CARR, *Master, R.N., H.M.S. "Pique."*

North China Herald, March 27th.

THE RIFF PIRATES.

The Riff pirates, it may be remembered, acquired some notoriety lately from an unsuccessful attack made on them by Prince Adalbert of Prussia, in which the latter was severely wounded. They belong to the Berber race, and inhabit the mountains and adjoining strip of coast lying between Tangiers and the Algerian frontier. This coast is called the Riff, and its population the Riffeeni. These tribes cannot be subdued by a few gunshots or a momentary descent on the coasts; for they would only retire to their fastnesses in the mountains, to return to the coast as soon as danger was over. A large fleet of gunboats might indeed do something, but at an immense cost, far beyond the value of the object to be attained, for the Riff pirates are too weak and too ignorant ever to rival in renown the daring exploits of the African corsairs of former days. All their navy consists in a few ill-constructed barques, with which the utmost they can do is now and then to pillage some merchant craft becalmed near their coasts. In such cases they generally leave the crew unhurt in possession of the vessel, after she has been relieved of her cargo. This occurs five or six times in a year, so that the damage done by these pirates is not insignificant.

The only way to deal with them is to signify to the Sultan of Morocco that he must henceforth be held responsible for their doings, and that it is therefore both his duty and interest to keep them within bounds by a force of his own. Should such intimation be disregarded by his Majesty, a force of twenty thousand men might be landed at Tangiers, and twenty thousand more at Rabatt or Dar el Beida. The Tangier division should at once march on Fez, a distance of forty leagues; that capital would be taken without striking a blow, for since the battle of Isly the people of Morocco are convinced that the Europeans are devils, effectually protected from harm by powerful charms and talismans, so that no force the Sultan could muster would stand against them even for an instant.

The capture of Fez would deal a mortal blow to the old spirit of Mussulman fanaticism, of which that capital is the focus. It would destroy the national conviction that Morocco, and especially the holy city of the Edrissites, is inaccessible to a Christian army. The treasures which would fall to the share of the captors, owing to the universal habit of hoarding wealth and concealing it in gardens and crevices, would amply repay the cost of the expedition, while literature would be enriched by an immense number of books and manuscripts forgotten for centuries in the mosques and holy places. All Moorish historians are unanimous in stating that, under the reign of the Edrissites, Fez rivalled Bagdad in literary fame, while her libraries became enriched with the spoils of those of the Lower Empire, and even of that of Alexandria. We may here remark, that Gibbon strongly doubts the truth of the accredited story, according to which the library of Alexandria was burnt by order of Omar. However that may be, the occupation of Fez would enable the conquerors to dictate conditions to the Sultan, not only on the subject of the Riff, but on many other points in dispute, especially if the Rabat division supported the demands by marching on Morocco itself.

The following fact is related as characteristic both of the love of gain, and the innate hatred of Christrians, which animate the Riff pirates. Every day the latter repair to the gates of Ceuta, as well as of the other *precidios* kept by Spain on the African coast, and bring provisions to the Spanish garrisons. Up to a certain hour of the day, the Spanish soldiers circulate freely among the Berbers; they buy or barter, conversing and jesting freely with them; and everything goes on in perfect good faith on both sides. Suddenly a bell is heard; this is the signal for retreat; immediately the Spaniards return to the citadel, and the gates are closed, while the pirates carry off the remainder of the provisions, take their muskets, and carry on with the very same Spaniards a warfare of musketry and sharp-shooting, which lasts until the market-hour of the following day.

Peacock and Buchan's Compositions for Ships' Bottoms.

One of the greatest annoyances that ships have hitherto had to contend with, particularly iron ships, is the rapidity with which the process of fouling goes on. Bourne, in his treatise on the screw propeller, published in 1851, says, on the authority of the Chief Engineer and Inspector of Machinery to the East India Company at Bombay (before the invention of Messrs. Peacock and Buchan became known), that when the *Indus* steamer was taken into dock at that port in 1846 he took barnacles off the bottom twelve inches thick, and eighteen inches long; and he also mentioned that the *Nemesis* was a mass of barnacles upon the bottom.

Captain Gribble, the Peninsular and Oriental Company's Superintendent at Bombay, says that the *Pottinger*, iron steamer, which left England in February, 1847, to perform a voyage to India round the Cape, was docked at Bombay in September. The bottom was very foul; the barnacles were six inches long, in large clusters. In the run a second layer had begun to form. The *Pekin*, which left England in February, 1847, was docked at Bombay in October. He could compare her to nothing else than a half-tide rock. The barnacles were nine inches long, the second strata being complete, with a feathering coral formation, sprouting from cluster to cluster. The stench from the decomposed animal matter was so great, that no one could remain on board at night, and the paint was tarnished, and the *Pekin*, a fast-sailing ship, was reduced by the fouling to six and a half knots per hour.

To remedy this serious evil, numerous experiments have been made from time to time by various parties, but with one exception, that of Messrs. Peacock and Buchan, failure more or less attended the whole of the attempts. Any discovery which would provide this great desideratum of preventing the corrosion of iron ships and the adhesion of marine shell-fish and sea-weeds, becomes a matter of almost national concern, and the mercantile interests of the country are greatly indebted to the gentlemen whose names stand at the head of these remarks for the successful manner in which they have accomplished this feat.

The beautiful appearance of the swift iron packet ships *Pera*, *Benares*, and *Salsette*, belonging to the Peninsular and Oriental steam fleet, whilst at Cherbourg, and the state and appearance of their smooth, pink-coloured bottoms, elicited the admiration of all the nautical savans present. The officers of the Imperial Naval Department, we are informed, made particular inquiries as to the merits of the composition applied to these ships, the use of the preparation from oxides of copper hitherto used in France having been found very detrimental to the iron plates, and militated greatly against the introduction of iron into the French navy, as well as their mercantile marine.

Messrs. Peacock and Buchan's invention appears to be a chemical compound entirely free from copper, but is acted upon by the marine acid of the salt water itself, whereby the poisonous quality destructive to animal and vegetable life is evolved, forming an unctuous pellicle, somewhat analogous to the slime found on the bodies of fishes, and which, at the same time that it preserves the iron from oxidation and corrosion, also imparts additional speed to the vessel by its slimy surface. They have also similar preparations for using on copper and zinc sheathing, and for protecting wood-bottomed vessels from the attacks of the teredo navalis, the advantages of which, as well as of that for iron vessels, are highly spoken of by many well-authenticated testimonials from the first authorities, lately published in the form of a pamphlet, now before us. One remarkable feature in the composition is the total absence of any copper admixture, which has been found so injurious to the iron plates, by galvanic action, when the protecting varnish gets rubbed off, and which it is impossible in practice to avoid, causing holes to be eaten through the plates.

THE ANDAMAN ISLANDS.

The following extract from a private letter written by an officer on board the *Roebuck*, contains some interesting intelligence respecting the Andaman Islands, now converted into a penal settlement for the mutinous Sepoys:—

Our cruise to the Andamans would have been pleasant had we had other than ship provisions in the mess. We called at Port Blair (our head-quarters), and found two of the Company's ships there, with Dr. Walker, Superintendent of the penal settlement, and other officers on board; and then went on our cruise to the South of Rutland Island, and as far as 12° 30′ N., keeping the land in sight all day (sometimes within a mile of it) to look for Malay vessels, which resort there for bird's nests and sea slugs. But we were unsuccessful; in fact, nothing was seen but a few native huts, and canoes hauled up on the beach. Only once did we see anything of the savages, who were bathing or fishing under the trees.

There are four Andaman Islands, Northern, Southern, Middle, and the Great Andaman; but these of course have several smaller islands attached to them. They are covered so densely with trees that nothing is seen of them.

Port Blair was the only part where we could venture on shore, and then only with our revolvers, in case of meeting some natives. The Company's ships have lost several men (one officer of the *Pluto*), and when the *Sesostris* sent a watering party on shore the other day, they were suddenly attacked by natives with bows and arrows, the latter pointed with hard wood, and found to penetrate a boat's side. Several arrows were fired, and one went through a man's thigh, which made our party run for it, not being armed, and return to the ship for muskets. When they got back to the watering-place, they found that the savages had decamped, taking with them the hoops off the casks.

Little is known about these natives. It is believed that they live upon fish; some live up the trees. The only kind of flesh to be had is that of the wild pig, which they shoot. This information was obtained by Sepoys in the following way I believe. Dr. W. sent several of them away into the interior with muskets and ammunition to explore the country, but very few of them came back, for they were nearly all killed by the savages. Before that, however, a great number of the Sepoys deserted, and those that returned, eighty in number, were hanged on the trees in Chatham Island.

There are two small islands in Port Blair,—Ross Island, at the entrance, and Chatham Island, in the middle of the harbour. Both of these are bearing the tents of about 800 mutineers of the highest rank, and as soon as the sweeps are caught up country in India, they are packed off to their new home in the Andamans, where they have to cultivate the ground, by first burning or cutting down the jungle. On Ross Island, while we were there, they were building an hospital, and a pier for boats. They are all alone, having only the Burmese, whom they despise, as guards, to look after them, with the naval guard of the Company.

Sayings and Doings.

ATLANTIC CABLE.—There are yet hopes for the Atlantic Cable, Mr. Whitehouse, the late Engineer, having offered to make it all right. It is to be hoped he will be allowed to do so, and it is to be supposed he knows something about it from his former important position.

The dry dock at Port Louis, Mauritius, has been completed. It is now in full operation, and is the only place where extensive repairs can be effected between England and India.

LOST ATLANTIC STEAMERS.—The following is a list of Atlantic steamers destroyed up to the present time:— 1. *President*, never heard of. 2. *Columbia*, all hands saved. 3. *Humboldt*, all hands saved. 4. *City of Glasgow*, never heard of. 5. *City of Philadelphia*, all hands saved. 6. *Franklin*, all hands saved. 7. *Arctic*, 322 lost, 87 saved. 8. *Pacific*, never heard of. 9. *Lyonnais*, 144 lost, 16 saved. 10. *Tempest*, never heard of. 11. *San Francisco*, 240 lost, 460 saved. 12. *Central America*, 422 lost, 170 saved. 13. *Austria*, 530 lost, 67 saved.

The Emperor of Japan appears to receive "attentions" from other nations than the American and British. There is at present in Simon Bay a steam-yacht, the *Nagasaki*, which is intended as a present from Holland to the Emperor of Japan, and is *en route* to that country.—*Cape Argus*, July 19th.

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

DECEMBER, 1858.

The Port of Lorient.

The discoveries of the great navigators of the fifteenth century stimulated the desire for more extended voyages. About the same time, among the different maritime nations of Europe, powerful commercial companies were formed with the view of trading with rich countries, which by a bold policy had become open to an enterprising commerce. France was not the last to enter on this course. The example of Bethencourt, a Norman by birth, who in 1402 had founded an establishment at the Canaries, had produced a good effect; and from that time the merchants of Normandy and Brittany formed companies which had for their object the establishment of commerce with Asia and Africa.

These beginnings had various results. Nevertheless, they originated the idea of a company of merchants seeking the privilege of an exclusive commerce to India, and which was granted to them by Henry IV. in 1604. The company, however, from want of resources was unable to satisfy the conditions exacted by Sully, and the enterprise fell from sheer exhaustion. A new company was formed in Normandy in 1616, and opened a commerce with the island of Java that lasted for several years. In 1633 some merchants of Dieppe joined in fitting out some ships, which they sent to Madagascar. Their success induced Cardinal Richelieu, in 1642, to form a society to explore that important island, and a large establishment was formed there, but was unsuccessful.

Louis XIV., anxious to give a powerful impulse to the maritime and commercial interests of France, commissioned Colbert, who then enjoyed his entire confidence, to examine into the acts of his predecessors on this subject and to establish a new company, in doing which he might profit by their experience. Colbert perceived the intentions of the King, and in 1664 formed an East India Company, to which he gave a grant for fifty years of honourable and advantageous privileges and a subsidy of four millions annually of francs, which was a considerable sum in those days. The conduct of the celebrated minister on this question was remarkable for good sense and reason. The King's letters patent were but the exercise of his own views. Colbert foresaw that for their operations the company would require a port, and he authorized them to establish one at the maritime village of Kerverot; near which afterwards Lorient was founded, on the frontier of the coast of Brittany, at the confluence of the Scorff and Blavet rivers, which fall into the sea near Port Louis, a place admirably chosen for it.

From time immemorial there has been on this part of the coast a well known little port called Blavet, situated at the entrance of the river of the same name. In 1590 it was fortified, but in nine years afterwards it was all but abandoned. Louis XIII., in 1616, considered it rather too near the entrance of the road, and directed the construction on the site of the town called Locparan, and the port of Blavet changed its name for that of Port Louis, which was given to it in memory of its founder. Louis XIV. saw the importance of this position, which commanded the entrance of a river forming an excellent natural port, and he added new fortifications to it in lieu of the old ones, which had gone to ruin. Works were also carried on to improve the port, and in 1663 he raised Port Louis to the rank of a town. By a decree of the convention of 1793 it was decided that it should be called in future Port Liberté; but by a decree of Napoleon I. in 1805 he directed that its own name of Louis should be restored to it, and which it has ever since retained.

In 1666 the East India Company commenced erecting buildings, principally for the residence of their servants and warehouses for their merchandize, but it was not until 1719 that they commenced those great works which indicated their former success. After having gone through changes from these successes to reverses equally as great, it was annexed to the West India Company, which had been founded by Law a short time previously. Independent of these two companies, there was another in existence, then called the Mississipi Company, with the privilege which Crozat, the Marquis of Chatel, had obtained for trading with Louisiana; a Guinea Company, for trading exclusively with Africa, and a special privilege, conceded in 1713, but not carried out, of commerce with China. These different companies were all concentrated in one by an order of council in May, 1719, under the title of the Company of the Indies.

The patent held by the new company conceded to them the exclusive right of trading to Guinea, Japan, China, Cochin China, in Siam,

at the Cape of Good Hope, Western Africa, Senegal, the Red Sea, Persia, India, and the two Americas. The new company was also declared the proprietor of the goods and chattels of all the old ones, and in the course of the same year monopolized to itself the article of tobacco, at the price of 4,020,000 livres, and farmed the excise of several provinces, besides entering into other speculations of a similar kind.

The Indian Company, thus constituted, purchased a considerable extent of ground at the confluence of the Scorff and Blavet, called the Lande of Loch-Roch-Yan, for the purposes of their operations, formed a port there, and built a town, which they completed with ramparts. This establishment was commonly called the port of L'Orient, because it was connected with the commerce of eastern countries. An edict, ratified at Versailles in June, 1738, confirmed this popular name, and decided that in future the new port should be called L'Orient, as it appears when officially alluded to at the time.

The Indian Company was granted a period of thirty years, from 1720 to 1750, in the course of which they did great things, acquiring a considerable power and realising large returns. During this time they completed Lorient, formed a fleet, fortified Pondicherry, constructed the magnificent trading port of Chandernagor, possessed several establishments on the coasts of Coromandel and Malabar, and treated on equal terms with the greatest of the Indian princes. At this time the company was patronized especially by the Comptroller-General Ory, the friend of Cardinal de Fleury, who appeared to have inherited the views of Colbert; and they enjoyed besides the support of a succession of eminent men, which developed their prosperity in a manner scarcely credible. Among these men the following may be mentioned:—

Dumas, director for twelve years, who obtained some important concessions from the King of Delhi, with whom he was allied, and defeated the pretensions of the Mahrattas. La Bourdonnais, who formed the colonies of the Isle of France and Bourbon, penetrated as far as Central Asia, upholding gloriously the honour of France. The Marquis de Bussy, who conquered the Deccan and was one of the greatest heroes of his day. And, lastly, Dupleix, an enterprising man, with a daring mind, who for twenty years exercised a preponderating influence throughout India.

The company at this time, notwithstanding the expenses of directors, was in a thriving condition. The produce of their commerce, in conformity with a special clause in their privileges, was sold by public auction at Havre, Nantes, or Bourdeaux, and was always of the richest description, and their inventories produced great profits.

This state of prosperity was checked about the year 1750. The tide had turned, and in four years more Dupleix was recalled. He sued the company, from which he claimed 13,000,000 francs, but died in great distress in 1763, before his cause was decided. The affairs of the company, which were then deplorably administered, daily declined; public opinion declared itself against them, and on the 13th

of August, 1769, a decree of council terminated the exclusive privileges which had been granted to them, and authorized all Frenchmen to trade in all those countries which had been confined to them. The promoters of these measures, in virtue of this decision, demanded and obtained the dissolution of the company, and by an act in May, 1770, ceded to the king, for 1,200,000 fr. of perpetual rent, the port of Lorient, their ships, storehouses, and buildings, as well as everything they possessed in all parts of the world. It was also decided that this sale should take place at Pondicherry, at the Isle of France, at Lorient, and at Paris on the same day.

Such is the history of this celebrated company. Founded in 1664 by Colbert, whose wise precepts were not always followed, it lived little more than a century. It was ruined by its own faults as well as those of the government; but, whatever they were, it must not be forgotten that it had some brilliant days, and that its existence was useful to its country. The principal object which Louis XIV. and Colbert had in view in founding it, that of contributing to the developement of the maritime power of France, was effected, as is proved by history.

No sooner was the sale effected in 1770, than the Naval Superintendent at Brest repaired to Lorient, and in the name of the King took possession of the ships, the storehouses, and all the property belonging to the company. An edict from Versailles at the same time declared Lorient as being classed among the naval ports of the country.

The company made an attempt to recover itself. At the instance of several who were interested, it was re-established by a royal decree of 14th April, 1785; but another of the Constitutional Assembly of 1790 again suppressed it. Another decree of the Legislative Assembly of 9th July, 1792, in consideration of the interest of some parties, re-established it for ten years; but on the 14th August, 1793, it was finally extinguished.

The entrance of the river Lorient is situated in a gulf which was formerly known by the Celtic words *Mor Bihan*, signifying Little Sea. This name has been attached of late years to the whole department, and includes the islands, of which the two principal are Belle-ile and Groix.

Belle-ile, which is seven miles from Lorient, is the largest in the possession of France, and owes its name to its fertility and beauty. It contains sixteen square miles. Towards the close of the tenth century it was presented by the Count de Cornouailles to the monks of Quimperlé, who afterwards ceded it to the Marshal de Retz, Governor and Admiral of Brittany, who fortified and built a good many houses on it. Henry IV. raised Belle-ile into a marquisate, and the celebrated Superintendent Fouquet purchased it in 1658. Notwithstanding his degradation in 1661, his family retained possession of it and the title. His younger son bore the title of Marquis of Belle-ile, and distinguished himself in the army. He became a marshal of France, and in 1758 was minister of war. The Regent reunited

Belle-ile to the Crown, exchanging for it other titles. The Indian Company owned some buildings on the island. The principal place on it now is Le Palais, which takes its name from the ancient castle of the Marquis of Belle-ile.

Ile de Groix is little more than three miles from the coast, and is four and a half long and one and a half wide. It is high and seen from far, which gives it importance to mariners. It has a population composed of fishermen, remarkable for their expertness and daring. And in the same gulf is Ile Quiberon, celebrated in the wars of La Vendee.

Passing ile de Groix and running to the northward, point de Gavre is seen, forming the extremity of the peninsula of that name, and marks the entrance of the roads and channels of Lorient. Between this point and the bay of Kerguelin there are several groups of islands, of which the principal are—*le Baril ronde, les Errants, les Truies, le Coteron.* From thence to Port Louis is an extensive roadstead, reaching to the mouth of the river. It is an outer roadstead, measuring about 3,000 yards from North to South, and 4,000 yards from East to West. In this basin on its western shore there is a group of isles called *la Pierre d'orge*, another called *les Saisies*, the fort of *Loqueltas*, and the hamlet of *Larmor:* on the eastern shore are the little groups of *Iles aux souris, la Potée de Beurre, les Sœurs Cabon, la Paix, Goëlan*, and the bay of Goerem, and the peninsula of Gavre.

The exterior road just mentioned decreases in breadth gradually, and at its northern extreme forms a narrow pass, which at the place where the citadel of Port Louis stands is not more than 200 yards wide. In the middle of this pass is a large rock, called *la Jument:* it defines the entrance of the road properly so called, which from thence to the *avant-garde*, which bounds the entrance to the port of the arsenal, is 4,400 yards long.

The port of Lorient from the *avant-garde* to the *arrière-garde* occupied only by ships of war, is 1,500 yards long and 220 yards wide. From the *arrière-garde* to the suspension bridge, near which are more establishments belonging to the arsenal, is a distance of 1,090 yards. The total area of the roads and channels of Lorient is about six miles, containing numerous excellent anchorages. The port is established in the Scorff, called formerly the river of *Pont Scorff;* below this and about 650 yards from the *avant garde*, the Blavet falls into the Scorff near Penmaré.

Lorient has sixteen building slips, five of which are on the side of the arsenal and eleven at Candan on the opposite bank. It also contains docks, which are about to be lengthened, and another which will be sufficient for all demands, is in course of construction, and will be a magnificent work.

Below the *avant garde* is the channel into the commercial port, which is 760 yards long, and communicates with a basin of 430 yards.

The town and arsenal of Lorient, although separated from each other, are still enclosed within the same lines of fortification. They cover an area of about twenty-nine acres, including the entrance of the port. The town, which dates only as far back as the beginning of the eighteenth century at the time of the reorganization of the Indian Company, is handsome and well built, and has a most respectable population. The arsenal is admirably built, containing all the materials for an establishment, and every thing required for vessels and ships of war. In the two bays, Keronar and Karguillé, are timber ponds, containing timber for building vessels of war.

Lorient has a school of gunnery, which is justly celebrated, established on Point Gavre, where experiments are carried on with guns intended for the vessels of war. The proceedings of the officers of Gavre, to whom this duty is assigned, enjoy a very high and well merited reputation.

The Scorff, which forms the port of Lorient, has its source at three miles from Greemenée in the arondissement of Pontivy. This river is navigable at the bridge, and mingles its waters with those of the Blavet, after a course of about four miles. The Blavet rises in the department of the Cotes-du-Nord, and becomes navigable at Hennebon, a little town of Morbihan, five miles from Lorient. Besides these two rivers the Ter, a small river, falls into the road near Ile St. Michael.

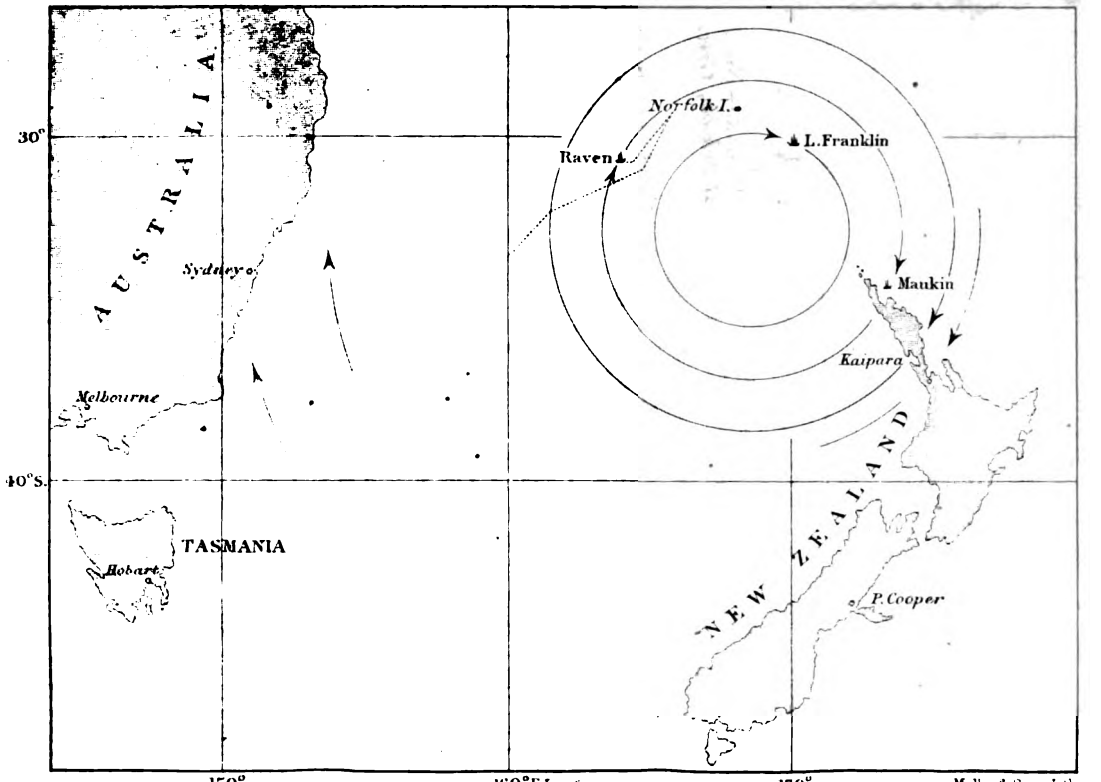
Lorient is the principal place of the third maritime arondissement. Since 1770, when it became a port of war, it has done good service to the French marine. Its port is secure and well sheltered, and is besides far removed from the attacks of an enemy. A powerful country like France requires not only good ports situated on the sea coast like Cherbourg, Brest, and Toulon, but also ports like Rochefort and Lorient, situated inland, and affording, as ports of refuge, all that can be desired. Lorient is also besides a building port. It has contributed ships of all classes, and has a high and well merited reputation. Among other steamers may be named the *Jean Bart*, the *Prince Jerome*, the *Wagram*, and the *Donawerth*, besides many others, and some at present in course of construction. Among the first is the *Ville de Bordeaux*, a fast screw steamer of 900 h.p., and 90 guns, of the same model as the *Ville de Nantes*, recently launched at Cherbourg, and the *Ville de Lyons*, now building at Brest. The *Ville de Bordeaux* was laid down on the 26th of June, 1854.

A letter which we have received communicates some interesting particulars of the destruction of the Rose rock at the entrance of the goulet of Brest. The Rose rock, the summit of which was at the level of low water, has been reduced down two yards. The horizontal section of this rock was five yards at low water spring tides, with a length of thirty-three yards across the channel, and a breadth of twenty-two yards parallel to the channel. The mud and sand accumulated round the rock increased its length. In order to remove it gradually stone bottles, called *touquecs*, filled with powder, were

SOUTH PACIFIC HURRICANES.

March 6th. 1852.

(Plate 2)



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placed on the surface of the rock. Each of them by its explosion removed a portion of the rock, and by means of a series of explosions of this kind the reduction of it has been effected.

A. L.

[The foregoing, which appeared in a French local newspaper, will interest our nautical readers, especially those of the old school. In reference to the Rose Rock removed from the goulet of Brest, alluded to at its conclusion, the reader will find the same process successfully employed in removing the Pot Rock at the entrance of New York Harbour, an account of which appeared in our volume for 1851, p. 612; but we have not yet heard of its successful application in this country.—ED.]

ON THE HURRICANES OF THE SOUTH PACIFIC OCEAN.—No. II.

By Thomas Dobson, B.A., of the Royal Naval Schools, Greenwich Hospital.

It has been shown that the storm of March, 1840, had a progressive motion to the southward of about ten miles an hour, and that it passed from the Feejee Islands to New Zealand along a course varying continuously from S.S.E. to South and S.S.W. The cyclonic nature of this storm may be inferred from the perfect accordance of all the facts with the laws of revolving storms; but I shall now show that the storms of this class are cyclones by a more direct method.

In March, 1852, the government barque *Lady Franklin*, was on a voyage from Hobart Town to Norfolk Island. The following extract from her log book was communicated to me by Capt. Willett:—

"1852, March 5th.—Norfolk Island bearing N.W., distant seventy miles. Midnight, till 6h. a.m., very strong E.S.E. wind. Under close reefed topsail and foresail. Six a.m. in foresail and topsail. Hove to, wind at East; veered to S.E., and continued blowing a very heavy gale. Topgallant-yards on deck and all snug. Barometer 29·57. Six p.m. began to moderate, gradually veering to E.N.E., and then dying away to a calm at 2h. a.m. of Saturday the 6th. Barometer still low. Six a.m. still calm. Seven a.m. breeze from the westward, gradually freshened and blew a heavy gale from W.N.W., but not so heavy as from East. The barometer commenced rising as soon as the wind changed. Eight p.m. moderate. Norfolk Island N.W. distant ninety miles. The barometer rose to 30·35, and stood there for seven days. Wind South and S.E."

The diagram gives the positions of several vessels involved in this storm, and the direction of the wind at each, at the hour of 8h. a.m. of the 6th of March; when the *Lady Franklin* had a heavy gale from the W.N.W.; the calm central area of the storm having just

passed over her to the Southward (since the wind shifted from East to West) between the hours of 2h. a.m. and 7h. a.m.

During a passage from Auckland to Sydney in the packet brig *Moa*, Capt. Bowden kindly allowed me to examine all his log books. The following is from the log of the brig *Raven*, bound from Sydney to Auckland, in March, 1852, and commanded by Capt. Bowden:—

"March 1st.—Noon, 33° 12′ S., 160° 38′ E. Light breeze from South.

"2nd.—Noon, 32° 33′ S., 162° 23′ E. Wind S.E., squally, with rain.

"3rd.—Noon, 31° 44′ S., 164° 53′ E. Wind S.E., frequent showers. P.M. wind East, heavy swell from southward; in royals. Midnight, in topgallant sails, wind East, a reef in each topsail.

"4th.—Noon, 29° 41′ S., 166° 7′ E. Wind fresh, and heavy cross sea. P.M. wind E.S.E., in jib and trysail. Strong wind and heavy sea. Midnight, Barometer 29·40. In fore topsail, double reefed main topsail.

"5th.—Noon, 31° 14′ S., 165° 24′ E. Barometer 29·46. P.M., strong gales from E.S.E., with a heavy sea and frequent showers. A sea carried away the larboard lower boom. In foresail. Midnight. strong gales from S.E., with very heavy squalls and rain. Sea running very high. Barometer 29·40.

"6th.—Eight a.m., wind S.S.W. Barometer 29.30. Noon, 31° 24′ S., 164° 41′ E. Strong gales from S.S.W., and a heavy head sea; washed away the head-rails. Midnight, wind S.W., more moderate, out reefs, heavy cross sea.

"7th.—Noon, 32° 21′ S., 166° 28′ E. Barometer 29·60. Wind S.W. and S.b.W. Midnight, light airs. Barometer 29·77.

"8th.—Calm. Barometer 29·80."

Throughout the 3rd and 4th of March the *Raven* is steering into the South-western quarter of the coming cyclone, wind E.S.E., and the mercury falling. On the 5th she returns towards the margin, and the mercury rises a little; but at 8h. a.m. of the 6th, when the *Raven* is about three hundred miles to the westward of the *Lady Franklin*, the centre of the storm has just passed her, the mercury is lowest, 29·30, there is a strong gale from S.S.W., and a heavy sea from eastward.

The whale ship *Maukin* was lost in Sandy Bay, near the North Cape of New Zealand, during the heavy gales of Saturday the 6th of March. Capt. Eames describes the disaster in the *New Zealander* of the 24th of March:—

"On Friday, 5th of March, the *Maukin* was sixteen miles N.E.b.E., by compass, from Knuckle Point, a stiff breeze blowing from the S.E. The vessel hove to under a close reefed main topsail, and heading about N.E.b.E., thus making a North or N.b.W. drift. A heavy sea running. Wind gradually increased towards night, got the quarter boats up to the davit-heads. About 10h. p.m. wind shifted to East."

"Saturday, 6th.—At 2h. a.m. wind hauled two points more to the northward, *i.e.* E.N.E. Between four and five a.m. it blew very

hard, so as almost to lay us on our beam ends, and the lee quarter-boat was swept away. About 10.30 a.m. saw the land on our lee beam, not more than a mile distant. Saw the North Cape on our weather bow. Determined to run into a little bay. As we went through the surf, one sea came aboard of us, smashing the starboard boat all to pieces and deluging the decks. All hands but two at the wheel, were in the rigging, or many of them would, doubtless, have been swept overboard. The vessel then struck, and a succession of seas poured over us. One man man was swept away and lost."

The *Katherine Stewart Forbes*, a barque from London, was off the North Cape, on Friday, the 5th of March, and lost one man off the foreyard during the heavy gale of that day.

In the *New Zealander* of the 10th of March, it is stated that—

"On Friday night, and during the whole of Saturday, the neighbourhood of Auckland was visited by a gale of unusual severity, the wind blowing for the most part E.N.E., and mounting to a furious storm at intervals. Much damage was done to fences, young trees, &c.; but it was in the harbours that the most injurious effects were experienced. Two cutters and a schooner were completely wrecked, and considerable damage done among the small craft. We have had no intelligence from the East coast, but we can scarcely venture to hope that the tempest passed over without producing injurious results in some places."

Captain Pulham, who publishes his meteorological observations weekly in the *Southern Cross* newspaper, informed me that the leaves of the trees at Auckland appeared withered and scorched after this storm.

From his observations it appears that at Auckland it was fine on the 4th of March, a gale from the S.E. and East on the 5th, a N.E. gale on the 6th, with rain and tremendous squalls; veering to N.N.E. on the 7th, and blowing fresh from West and S.W. on the 8th.

H.M. surveying ship *Pandora* was lying at anchor in the Kaipara, New Zealand. On the 4th of March the mercury stood at 30·13; on the 5th, barometer 30·01, at 2h. p.m., wind increasing East to E.N.E. (5—8), veered out cable to 45 fathoms. On the 6th, wind N.E. (8—10), mercury falling gradually from 29·85 to 29·77 at noon.

Having housed topgallant-masts and veered out 77 fathoms of cable, at 10.50 the small bower parted. Let go best bower and veered to 60 fathoms on ditto. Noon, struck lower yards and topgallant masts, much sea, ship driving, touched ground. Landed the ship's company, with the plans, tracings, chronometers, provisions, &c.; battened down hatches, left the ship and encamped on land. Wind N.E. (10—9—8, cmd).

7th of March.—Ship aground high and dry, and shored up on the left bank of the Kaipara; continued landing guns, &c. At high water hove ship off with a kedge. Ten a.m., wind N.N.W. Barometer 29·79. P.M., wind N.W. (8—9, bcmq).

8th.—Wind N.N.W., West, and S.W. (8—7—5, bcq).

9th.—Wind S.S.W. (5—7); barometer 30·01.

The progress of the South-eastern quarter of the cyclone appears to have been considerably checked by the lofty mountain chains of New Zealand; for the first indication of the storm is at noon of the 6th of March, at Lyttleton, Port Cooper, Banks Peninsula, on the East coast of the Middle Island, where H.M.S. *Calliope* was lying at anchor.

1852.	*Friday, March 5th.*				*Sunday, March 7th.*				
	Wind.		Wthr.	Barometer		Wind.		Wthr.	Barometer
	Course.	Force.				Course.	Force.		
A.M. 4	..	..	bc		A.M. 4	N.E.	6	ocq	
8	N.E.	1	..	29·98	8	..	7	ocqr	29·68
12	..	1	..	30·00	12	N.E.b.E.	7—5	cr	29·58
P.M. 4	S.S.W.	1	..		P.M. 4	S.W.	3	c	
8	N.E.	3	..	30·00	8	..	..	..	29·49
12	..	..	..		12	..	..	..	
	Saturday, March 6th.					*Monday, March 8th.*			
A.M. 4	..	..	bc		A.M. 4	S.W.	4	c	
8	S.	3	..	30·01	8	..	..	..	29·58
12	N.E.	4	bcq	30·01	12	S.S.W.	3	bc	29·60
P.M. 4	N.N.E.	5—7	..		P.M. 4	S.W.	4	bc	
8	N.E.	7—8	..	29·94	8	..	3	..	29·63
12	N.E.	7	..		12	..	2	..	

Tuesday, March 9th.—S.W. (3—2) all day, barometer 29·63.

Wednesday, March 10th.—E.b.N. (1, bc). Working out of Port Cooper.

It will be interesting to ascertain what effect was produced on the weather on the Eastern coasts of Australia and Tasmania by the passage of the cyclone to the Southward down the West coast of New Zealand.

The following remarks are from the observations made at the light-house at South Head, Sydney:—

"Friday, 5th of March.—Very light West airs. P.M., increasing to strong breezes from N.E. During the afternoon electric nimbus kept rising in the West and S.W., and passing over to the East and N.E. with thunder. About 9h. p.m. a dark range of clouds swept over to northward, with a southerly squall, and it continued to blow heavily from South through the night.

"Saturday, 6th.—Coarse southerly winds and flying showers in forenoon. Between 2h. and 3h. p.m. storms of rain with thunder from S.W., and atmosphere quite cold and chill. Subsequently fresh S.W. wind, passing nimbus, cold and raw. After 10h. p.m. a cloudless sky.

"Sunday, 7th.—Light westerly airs till 9h. a.m. N.B.—A re-

markably heavy swell setting in all this day and night from E.b.S., which has caused a great surf to break against the cliffs."

The *Sydney Morning Herald* states that the *Keera* steamer left Sydney on the 6th of March, at 8.5 a.m., against a strong southerly wind, and arrived at Wollongong at 4.45 p.m., although the sea was running so heavy that several craft, including the *Shamrock* steamer, lay snug in Watson Bay until Sunday morning.

The same paper states that on the 5th of March, while the *Star* whaling barque was running for the middle ground, she encountered a heavy gale from the S.E. Rounded the ship on to the starboard tack, the wind suddenly veered to the South, with a heavy sea running, which stove the lee quarter-boat, carrying away the davits, and starting the covering board, after stanchions, &c. Compelled to cut away the boat. Captain Eury put into Sydney to repair.

The log of the packet brig *Emma*, then on her passage from Hobart Town to Sydney, shows the influence of the cyclone on the winds off the East coast of Tasmania:—

"Saturday, 6th of March.—P.M., gale from S.W. and rain. Cape Pillar N.E., four miles.

"Sunday, 7th.—Hard gale from South and thick weather. Midnight, moderating. Ten a.m., Cape Howe S.W.b.S. twenty miles.

"Monday, 8th.—Hard South gales, squalls, and heavy rain."

The southerly wind on the 6th, and the heavy swell from E.b.S. on the 7th, are evident effects of the cyclone; of which the passage is also distinctly recognized by the barometer at Sydney, where the mercury fell gradually half an inch from the 2nd to the 6th of March, and then rose gradually until the 9th.

At Auckland the mercury fell gradually about half an inch from the 3rd to the 7th; but continued to rise until the 12th; thus indicating the passage of a chord of the cyclone of greater length than that which passed over Sydney.

The central portion of the cyclone probably passed over Norfolk Island.

In the fourteenth chapter of Hunter's *New South Wales*, is the following excellent description by Lieut. King, R.N., of a hurricane which occurred at this island in February, 1789, and which was evidently a cyclone of the class now under consideration; the centre passing a little on the West of the island, and to the Eastward of South:—

"The month of February, 1789, commenced with heavy gales of wind and deluges of rain, which greatly damaged the Indian corn, and different plants that were seeding. On the 16th the heavy rains having subsided, and the weather being fair, we embraced the opportunity of examining the state of our provisions, which were stowed in our cellars. But this interval was succeeded by a hurricane that was dreadful beyond description. In the morning of the 25th, we had light winds from N.E., and very dismal dark cloudy weather, with constant torrents of heavy rain. Towards noon, the wind blew a

gale, and kept increasing in violence. At midnight it shifted to E.S.E. and blew with great fury, attended with constant deluges of rain. At 4h. a.m. of the 26th, several of the largest pines were blown up by the roots. From four until noon, the wind increased to a very severe hurricane, with the heaviest rain I ever saw or heard of. Pines and oak trees of the largest size were blown down every instant, the roots were torn up, with the rocks that surrounded them, frequently leaving pits at least ten feet deep. Some of the very large trees, which measured 180 feet in length, and four feet in diameter, were thrown by the violence of the tempest to a considerable distance from the place where they grew; and others, whose roots were too deep in the earth to be torn up, bent their tops nearly to the ground. In addition to the horror of this scene, a very large tree fell across the granary, and dashed it to pieces, staving a number of flour-casks that were in it. The gale now raged with the most violent fury, which defies all description; whole forests seemed, as it were, swept away by the roots, and many of the trees were carried to a considerable distance. By one o'clock in the afternoon there were as many trees blown down round the settlement as would have employed fifty men for a fortnight to cut down. The swamp and the adjoining vale were overflowed, and had every appearance of a large navigable river. The surf ran mountains high. In the road the sea ran very high, often eclipsing Nepean Isle. Strong log houses were blown down. The violence of the wind blew up cabbages, turnips, &c., by the roots; and what vegetables remained in the gardens were turned as black as if they had been burnt. At 3h. p.m. the wind veered round to South and moderated; and at sunset the weather was very pleasant. During the remainder of the month we had pleasant weather, the wind at S.W., but a heavy surf kept still running.

"The S.E. wind blows here during the summer with very little variation, and sometimes very strong."

The S.E. wind here mentioned as blowing invariably, and sometimes strongly, during the summer or hurricane months, is the regular trade wind of the South Pacific Ocean; and is not to be accounted as either the initial or final component of a cyclone without much caution. Commodore Wilkes and Captain Erskine state respecting the storms among the islands of the South Pacific Ocean, that "the missionaries say that these storms begin at N.W., thence veer to the Eastward, and end at S.E.," and hence Captain Erskine infers that these cyclones travel towards the N.E., that is, towards the equator. But the easterly winds just mentioned probably formed no part of the cyclones, which certainly travel towards the S.E., as will appear from the data furnished by the missionaries themselves from their journals.

Description of the Amoor River, with Particular Considerations Hydrographical and Ethnographical,—*By Peschtschuroff.*

(Continued from page 579.)

At cape Sberbiejeff, a high and gloomy mountain, which projects far into the river, the Amoor turns suddenly to the South, and runs on its way 200 versts, through a ridge of high and densely grouped hills. Above the river Oou, which enters on the right side of the Amoor, its banks form here and there small plains; but from the Manchu watch-post near the river Oou, the Amoor is literally pent up in stone walls, which enclose it on all sides. The current, which sometimes reaches five knots, and the steepness of the mountains, are the reasons why this tract is uninhabited. The soil bears clear tokens of good condition, and fine woods of white and black birch, oak, and elm, cover all the slopes in any degree accessible; there is no want either of firs, larchtrees, or pines.

Notwithstanding the rapid current of the Amoor on the track just described, and its pertinacious struggle against the rocks which surround it, it has not been able to sweep away a single clod of earth, except to form two small islands situated near the end of the rapid. These two islands, which bear very opposite characters, are also situated at different sides,—the one on the right bank, the other on the left bank, of the river,—which has here over its whole breadth an equal depth of twenty-six feet with a stony bottom. The island to the right, calculated by the current, is 0·6 of a mile in length, narrow, but a few fathoms high, and covered with close-leaved birches, oaks, and elms. The dense shadow of these trees protects the ground against the heat of the sun, and causes to spring up a high and succulent grass, several kinds of which reach the height of a man, and are interwoven with the creeping shoots of the wild vine. The grapes, which were already in clusters when the *Nadeschda* passed, fix the attention of the traveller, and raise in his mind anticipatory pictures of luxurious plains. The second island is a high and steep rock, not longer than the first, but much higher and rougher. The reddish walls pain the eye by their uncertain colouring, and even the shrubs and trees, which are grouped picturesquely at the edges of the slopes, seem misplaced from the wildness of the whole picture.

The same is to be said of the banks, the right, low, with a rich vegetation; the left one high and gloomy, more varied in its outlines than the other, and at the same time wilder; but a few miles further to the southward we do not recognize the distinction: the one drops its woods by degrees, and changes to a fertile but monotonous plain; and the rocks of the other disappear from the bank, until it becomes level like the right.

After this sudden change in the character of the banks of the Amoor, it continues for a time its way to the South; then it turns suddenly to the East; and now begins an endless archipelago, with

long smooth-washed cliffs at the sides, *i.e.*, downward and upward. This archipelago stretches to the river Sungari, and reaches to within a short distance of the island Sanof Kirile. The islands between the upper end of the archipelago and the Sungari do not very much impede the shipping, for they crowd now on one now on the other side of the river, without any natural connection betwixt the clusters, and leaving always space enough between them and the opposite bank of the river. The vegetation of these islands is limited to the sand-willow, which grows on the most grassy banks of the river. This country is quite uninhabited, and the succulent grasses wither unprofitably. It is only at the mouth of the Sungari that one sees three or four small dwellings, surrounded by a circumvallation of hurdles, which serve as an abode to the chief Mandchurian watch-posts at the lower Amoor, known to the timid and weak inhabitants of the lower countries under the name of Dschang-Dschu.

The Sungari river enters the Amoor at its turning to N.E. The union of these two large rivers is little to be perceived, from the Sungari making a circuit a few miles from its mouth, which is concealed by a few low islands situated near the left bank of the river. The Sungari is formed by the two rivers Giren and Nann, which unite in the neighbourhood of the town Giren-Chotun. The sources of the first are to be found, as stated before, on the same mountain-ridge in which are the sources of the Kamara and Gan; the latter comes from the interior of Manchuria. As the Manegrians we met told us, the valley of the Sungari is the most populous of the whole Amoor country, in consequence of the fertility of its low banks, the convenience for communication yielded by its slow, steady current, on a loose sandy ground, and from the absence of rocks and shoals.

Besides many insignificant places nestled on the banks of the Sungari, several towns are situated near this river and the Nann, in the following order from its mouth upwards:—Itschai, Altschuka, Kolon, Tschitschigar, and Mangar. At the union of the Giren and Nann we find Giren-Chotun, where almost all the vessels for the trade on the Amoor are built, and which, like Tschitschigar and Mangar, is three times as large as Aigunt. Manchurians and Manegrians (a nomade tribe subjected to China, which has the right of free river-trade beyond the borders of their pastures,) in eight days reach Itschai, shipping their light boats, which are either tracked, or propelled by poles against the current. The voyage to Tschitschigar occupies no less than a month; thus the length of the Sungari to the mouth of the Giren, would be 1,000 versts. It takes three or four days to go direct from Arguns to Tschitschigar.

The low banks and numerous islands above the mouth of the Sungari extend farther down, but with this difference, that they are gradually being washed away by the Amoor, the water of which becomes by it more muddy. At the cape Gaidin, a branch of the mountain range, visible southward, approaches the river, but soon retires again, leaving behind a large plain, meandered by many brooks. The absence of hills and the intricacy of the islands are particularly observ-

able two days' journey above and below the river Chorolog [Chorolak on the map], which enters the Amoor from the right hand side, almost in the middle of the island-labyrinths, and in the summer time allures a great many Manchues to its banks for fishing. The buoys of the nets sometimes retard the progress of the ships; and the conical birch-bark jurtas, and the variously shaped boats of the fishers, were to be seen in great numbers at every island. It is obvious, however, that the abundance of fish in the Sungari and Ussuri offers no sufficient means of attraction to the Manchues; for on the whole track between the two rivers named one sees but few settlements. The few wretched hovels to be met with are not even built under the shade upon one of the islands, but on projecting points of the bank.

The Ussuri forms the boundary of this man-deserted wilderness. This river enters the Amoor from the right hand side, a little North of its great turning, and separates the extensive plains from a high and steep country, which certainly affords to the islands and river branches much space, but never ceases to dispute with them, and which sometimes pushes forwards its mountain ranges to the very river. Here settlements of the Goldians are frequently met with, at first only two or three houses together, then crowded in dozens. The gentle inhabitants prove very useful to travellers, from their knowledge of all the turns of the river and its branches. By help of their pilots the *Nadeschda* continued her journey for twice twenty-four hours, day and night, between the Ussuri and the village Sawaga, on these intricate branches, which were not wider than from 130 to 60 yards and often less. The villages also provided our steamer with wood, which was very difficult to be had, the banks growing chiefly sand-willows, which are not suitable for steam fuel.

Three miles northward of the village Sawaga, the Amoor divides into two wide branches; the right hand one turning at first E.N.E., then running along a steep bank, changing to the North, and uniting with the left hand branch at the island St. Kirile. The left branch, which is much more impracticable, forms the third side of the triangle included by them, and is therefore much shorter. The space between the two branches is intersected by many of the most meandering branches of various sizes, and the distance from the bank of one main arm to the other is here fifteen miles or upwards.

Behind the island St. Kirile, the Amoor flows in one bed; but opposite Cape Ommer, a high round hill, the river spreads out in an almost incredible manner, and offers to the eyes of travellers an expansive sheet of water, with islands scattered here and there, and bordered by an horizon of blueish mountain tops. This enlargement has obviously exhausted the last strength of the Amoor, which near here unites more and more in one channel. High mountains and steep banks compress it by degrees into a broad ribbon, encircling a few gloomy cliffs, as at Cape Cholge, or at the cliff opposite the village Teri. After having run some seven or eight miles in this narrow space, and being augmented by the rivers Goryn, Numur, and other shallow mountain streams, the Amoor branches off again into three streams,

the largest of which connects it with Cape Kisi and the military station Mariinsk, which is situated on its shore. Thirteen miles above the post of Nikolajewsk, all the branches unite again into one river, which is 1½ to 2 miles wide, and 140 to 200 feet deep.

Notwithstanding so considerable a mass of water, which in this manner enters the Gulf of Tartary with a velocity of three knots, the flood-tide does not suffer it to remain of a depth worthy of the Amoor till it reaches the ocean. Directly below the capes at its mouth, Pronge and Tebach, the water becomes shallower, and falls in the South to thirteen, in the North to ten feet, at low water. From this rapid survey one can see that the number of branches and islands that enrich the basin of the river, and which often give it the appearance of a small inland sea, must have offered a great hindrance to the first expeditions; and the more so as in the journey upwards the rapidity of the current compels the navigator to take the smaller and quieter passages.

The tribe of the Goldes,—a meek, timid, and good-natured people, used to the river life, and spread over a large portion of the island-labyrinth; conversant with the river through their frequent intercourse between the villages and the convoy of the trading Manchues,—make good and trusty pilots.

Another impediment to navigators is the long reefs of the islands, and the many changing sand-bars in the middle and on the banks of the river, near which the current is frequently very rapid. Of these islands, those further from the bank have each their reef upwards and downwards. The first generally extends from the corresponding farther point of the island to the next projecting point of the bank; the other stretches into the middle of the river, and has a greater depth at both its sides. The banks of sand and small stones become more frequent below the river Burija between the scattered islands, of which they are sometimes the continuation, or if not so, form low projecting capes. Their form and limits are very difficult to ascertain from the frequently changing depth of water and their own instability. It is generally to be remarked that between the flat banks above and the muddy bottom of the river, there are neither stone nor sand-banks very dangerous to navigation; but between the steeper banks flats become harder and pointed rocks sometimes appear. The two main rapids of the river are in the neighbourhood of the cliff Malaga Nadeschda, the one being five, the other three feet in height. Passing over them, care must be taken not to get on the shallows surrounding them, for it is very hard work to get off again.

Besides money, consisting of small silver coins, one must be provided for the journey with cloth, *daba* (blue woollen stuff of a bad quality), common Russian tobacco,—which the river population prefer from its inebriating qualities, to the Chinese, and even to the American,—gunpowder, lead, various small articles of gilt or silvered copper, ordinary glass and amber beads, also some black and blue plush. The tribes living about the middle of the Amoor, know the value of the silver and cloth through their traffic with the Manchues.

The population of the Amoor, unequally distributed over its immense track, may be divided into about ten settled, half-settled, and nomadic tribes. To the first belong the Manchues, Nekanians, and Daurians, although the latter are to be found near the Amoor only in small solitary houses, which serve them as places of repose from hunting in the rather distant mountains. In the villages and towns near the Sungari, the numbers of the Daurians and Nekanians are each equal to that of the Manchues, who form the military force of the country, and are all paid, probably, by the taxes taken from the other tribes. Externally, these three tribes differ but little. All of them have round, stout faces, with flat eye-brows, dark bronze skins, of middle size, with dark brown *(dunkel blonde)* hair, which is plaited into a tail. The common people do not shave the head, and their tangled hair-dress looks like a hay-rick, round about which is wound a tail for the purpose of keeping it together. Their garments consist of a wide shirt of Chinese cut, very wide trousers of linen, which are stuffed inside the hose or turned over near the knee and fastened by a cord, Chinese shoes with up-turned points or shapelessly formed out of skin. Besides the shirt, they wear a short kaften made from the skin of wild beasts or fishes; it is fastened by a leathern belt, in which they carry a small knife, a copper pipe tube, tinder box, and tobacco bag,—the inseparable companions of all Asiatics.

The bold Manegr Selgenii, who has visited every portion of the Amoor, and whom we met afterwards, did not judge very favourably of the Daurians: according to my personal experience, they merit at least the preference in comparison with the Manchues. The detached dwelling-places of the Daurians are scattered between the rapid part of the Amoor above the Sungari and the town of Aigunt; neither above nor below these boundaries were they to be seen, at least not in the neighbourhood of the river banks.

The Manchues, the lords of the rich plains near the middle part of the Amoor, occupy on this river a tract of 100 miles below the Seja. On this fertile stream, along both banks of the river, their isolated houses form a scattered line; they are hidden behind the small hills formed by the sand thrown out by the river and a few trees, which are only to be found in the neighbourhood of these houses. From the hamlets towards the interior of the country, on the right side of the Amoor, on the slope of a soft elevation, appear carefully cultivated fields, which, to judge by the comfort shown in the houses, richly remunerate the industrious farmers. The scarcity of every kind of wood in the neighbourhood of the dwelling-places of the Manchues compels them to send small expeditions to the dense forests at the upper Amoor, above the Seja, and in the neighbourhood of the Kamara; where they make rafts near the banks, and float them down to the villages and to Aigunt, unmolested by the regardless inhabitants of the Russian stations.

One of the chief occupations of the Manchues, besides agriculture and shipping rafts, is fishing in the island-labyrinths near the river Chorolog; but the inhabitants of Aigunt and neighbouring villages

do not take part in it, for the rapids on the Amoor prove a great impediment to quick communication. Near the mouth of the Chorolog assemble the Manchues and the Nekanians from the Sungari. The Daurians do not participate in this harmless traffic; being eager hunters, they prefer the pursuit of the isubr,* elk, and beasts of prey in the woods.

Although the settlements, properly so called, of the Manchues are of but limited extent, the people are to be met with over the whole track between the Kamara and the Chorolog, and even still further down, almost to the mouth of the Amoor. The reason of the scattering of these traders, timid by nature, is to be accounted for partly by the fishing, partly by the endeavour to cut off any profit from their neighbours, and also in the establishment of military posts to watch the tribes subjected to the Manchues. The chief posts are situated near the mouths of the rivers Sungari, Kamara, and Ussuri; the less important, established chiefly for facilitating communication, are to be found half way between the former. Each of these military posts consists of twenty to twenty-five Manchu soldiers, under command of one or two Boschkos, or lance-corporals, whose chief occupation consists in collecting the taxes. For all the tribes subjected to China, these are fixed equally at one sable for each male between fifteen and sixty years of age, and are collected twice a year, at the gathering and dispersing of the tribes in March and October. Such as fall into arrears, whether Manegrians, Kaplarians, Belarians, or Goldians, betake themselves to Aigunt or the Sungari, when they can earn by trade enough to pay their taxes, notwithstanding their being plucked by the well-to-do traders into whose hands they fall. The domination of the Manchus falls most oppressively on the tribes of the lower Amoor; for these are even prohibited on pain of death, from going farther upward than to the Sungari,—a measure which seems to have been establishrd chiefly for the benefit of the Manchu traders.

We must reckon amongst the settled tribes the above mentioned Goldians, the Manguntrians, Samagirians, and Giljakians, but being scarcely if at all acquainted with husbandry, and frequently leaving their winter dwelling places, we call them only half settled. The features of these tribes being very similar, it would require more detailed knowledge to state correctly their boundaries; for this reason we must restrict ourselves to a superficial glance at their manners of life Their dwelling-places occupy the whole length of the Amoor below the Ussuri, and the Giljakians even spread farther to the sea shore, northward and southward from the Amoor, and on the island Sagalien. These keep themselves separate from the others, who are more or less mingled. The most numerous are the Goldians. The Samagirians are chiefly settled near the river Goryu; the Manguntrians between the Goldes and Giljakians, and all live chiefly by fishing. The winter

* According to the author, the isubr is an animal resembling the elk, but smaller. Its meat is good, and in its horns is a marrow which is estimated by the Chinese for its healing powers, and sold very dear.—A. P.

dwellings in these villages resemble large square sarais, with wooden benches along the four walls and round the stove, which stands in the middle on the hard beaten ground. In such a house is to be found a whole family, from grandfather to grandchildren, sometimes from thirty to forty persons of both sexes. Round the houses and along the banks are drying places for fish and nets; and at some distance from the river, more towards the interior, one sees cages with bears.

The bear is among these tribes, and mainly with the Giljakians, an object of the most tender attention for a whole village, and plays the first part in their religious ceremonies, which however end for him tragically, for at last he is killed and roasted for a general feasting. The further we go from the mouth of the Amoor, the less we meet with this ancient custom. At each village are to be found a number of boats for fishing, which consist of three boards: the one forming the bottom is curved at the ends, and the other two are fastened to it by wooden nails. Their size varies between two and sixteen oars. For short and speedy journeys they use small canoes made of birch bark, which are called Omorotsches.

In winter time, the traffic is carried on by light Nartes drawn by dogs; and this swift manner of travelling assists the Russians materially in exploring the country. To be just, one must say, that generally, with the exception of the ruder Giljakians, living on the Sagalien, the other tribes, and even the river Giljakians, have helped to secure the comforts of life to the Russian settlers among them.

The pure nomadic tribes near the upper Amoor are the Orotchians, Manegrians, the Gantsians (Singul Ganets), and Kapliarians. The Orotchians, who are a branch of the Tungusians, under the protection of Russia, wander in our countries adjoining China, and are occupied during the summer in fishing, and during the winter with hunting. The Manegrians are the most numerous of the nomadic tribes subjected to China; they roam in the neighbourhood of the Kamara and its valley. They occupy themselves in hunting and fishing, are divided into clans under particular chiefs, and muster soldiers, who are sent to the Sungari. During the late troubled times in the Celestial Empire, a militia was raised in the Amoor countries, and the Manegrians mustered 1,000 men for this purpose. The other above mentioned tribes belong to the stock of the Tungusians, wandering on the left bank, and have probably received their names from the rivers near which they are to be found. The Beliarians are to be found on the left, the Kapliarians and Gantsians on the right bank of the Amoor. All three pay tribute in sables to China. Their poverty is so great that they often for many weeks live only upon the dried fruit of the lotos-tree, and go almost half naked, notwithstanding the severity of the climate.

(To be continued.)

THE AMOOR,—*Projected Railway to Castries Bay, with its Town.*

A letter from the Amoor, by a superior officer, and addressed to the *St. Petersburg Gazette* of the 8th of October, contains some curious details on the importance of this new acquisition to Russia.

The author of this letter has been charged at his own request, by Admiral Kazakevitch, Governor of Nicholaefsk on the Amoor, to explore the country in order to open a new road of communication. "I should observe," says the letter, "that from where I write the Amoor is not above forty miles from the sea. On this part of the coast so close to the Amoor is the magnificent bay of Castries, discovered by La Peyrouse, and called by him after the Minister of France at that time. But the cape forms a natural arch of rock, through which the vessels passed bearing the name of La Peyrouse.

This bay affords a safe and commodious port for large vessels while the mouth of the Amoor cannot receive ships of above 14 feet draft. Further on the Amoor diverges more from the coast, and not more than 220 miles lower down it falls into the sea. Therefore it is evident that if a railway be formed from this point, all the merchandize which comes from Siberia by the Amoor, as that from America to Siberia, will shorten their distance by many miles, an advantage evidently, since by this means ships need not take the entrance of the river, difficult and tortuous as it is, and may load in the gulf of Castries.

The country surrounding this gulf is covered by primitive forests. The trees there attain a height of more than 120 feet, and are as straight as an arrow; their diameter is nearly three feet.

The author of the letter has succeeded in discovering the best route among the mountains for the railroad in question. The gulf of Castries has been declared a free port. The same person has been directed to lay out the plan of a town at the mouth of a small river which falls into the gulf, which town will not be long appearing as the railway progresses to connect the Amoor with it.

All vessels, foreign as well as Russian, continues the author of the letter, that navigate the Amoor, take pilots at Castries for the river. Among the vessels stationed in the gulf is the Russian tender *Kamtchadal*, from China, with despatches for Admiral Pontiatine. During his voyage the Admiral discovered another gulf much to the Southward of Castries, and situated opposite to the Japanese island Matsmai: to which the Count has given the name of Port St. Vladimir,* and fixed a cross with an inscription stating that the port has been discovered by and belongs to the Russians. The inhabitants of the coast are the same race as the Japanese, and state that no ship was ever there before, and were besides not a little surprised at seeing the Russian steamer *l'Amerik.—Moniteur de la Flotte.*

* Is not this Sir Michael Seymour Bay?—ED.

The Red Sea in 1857.—*By Baron Richard de Niemens.*

The Journal of the Society Oriental in Germany, in its third number for 1858, contains an article entitled the Red Sea and its Shores in 1857, considered commercially and politically, the author of which is Baron Niemens. This young, intelligent, and enterprising traveller determined on exploring the unknown countries of Darfour and Wadi. In order to prepare himself for so perilous an expedition, he travelled through part of Egypt and the country by the Red Sea. On his return to Cairo in the spring of 1858, he made the necessary preparations for his journey, sent a portion of his baggage to Kartoun, and prepared for setting out for Suez, Souakim, and Dacca, when he was suddenly overtaken with illness, followed some days afterwards by tetanus. Nothwithstanding the efforts of the most skilful physicians, he died in the flower of youth and health on the 15th of March, 1858. During his stay in Egypt he addressed several excellent papers to scientific journals in Germany, amongst these is that of which the following is an abstract.

The Baron fully perceived the great importance of the Red Sea in a commercial point of view. In this light, and with the prospect of the canal through the isthmus of Suez, he was desirous that his fellow countrymen of Southern Germany, the trade of which requires more and more an outlet, should take timely measures to be in a position to profit by this enterprise, and it was with the view of affording the desirable information that he gave a detailed account of the existing state of commerce in those parts. In proceeding down the eastern coast of the Red Sea he meets first with

The Hedjaz.

The Arabs include under this name that part of the Western peninsula of Arabia which extends from the coast of Syria along the Red Sea as far as the town of Hali on the frontier of Yemen and the country of the mountaineers of Assyr. Towards the interior it is impossible to draw a line to mark with any certainty the limits of the Bedouin tribes dwelling between the Hedjaz and the Nedjd.

The country forming the continuation of the Syrian desert, with a few exceptions, is one vast extent of rocky and arid plain, presenting the most disheartening prospect to the traveller. Poor and sterile to the last degree, it affords only a trifling quantity of dates; it fails in everything, even to cereals, and wood so necessary to man. Hence the population is very scanty, and compelled to depend for the greater part of its subsistence from the Egyptian coast. The produce of the Hedjaz are the *harnch juer* (a kind of black coral) and combs formed of ebony.

The two principal cities are Mecca and Medina, much frequented as the holy places of Islamism; and it is to these alone that the Hedjaz owes all its importance. The crowd of pilgrims and merchants resorting from different parts of the world to Mecca has made Jedda,

in a commercial point of view, the most interesting port for many centuries on the borders of the Red Sea.

The merchants of Muscat, India, Singapore, and Eastern Africa, go there by sea, while those of Persia, Syria, and Egypt, send their merchandize there by caravans from Mecca. The caravans of the Maugrobins, (of Tunis, Algiers, and Morocco,) as well as those of India, have ceased frequenting it for some years. Consequently commerce has considerably increased from the number of pilgrims crossing from Central Africa, particularly Darfour, Wadi, and Timbuctoo. But in all this movement the most important commerce is that of Europe by the isthmus of Suez.

The government of the Hedjaz is partly in the hands of a Turkish Pasha, who is governor of the whole shore of the Red Sea, and partly in those of the High Sheriff of Mecca. This division of power between two chiefs, has produced complete anarchy, such that the Arab tribes even in the immediate vicinity of ports occupied by the military do not in the least recognize the Turkish authority, and only that of the High Sheriff when it pleases them to do so.

The authority of the Turkish Governors in the towns is supported by the recognition of duties on the imports and exports of merchandize. The collection of duties and the functional property are not subject to imposition in consequence of the sanctity of the Hedjaz. The annual revenue of all the custom-houses under the present administration, amounts to 90,000 thalers, to which the trade of Jeddah contributes 77,000, the Austrian thaler of Maria Theresa being 5 francs 60 centimes.

The expences of the government are annually from 850,000 to 900,000 thalers, and consist besides that of 3,500 men, the apanage of 400 purses (of 500 crowns) payable every year to the High Sheriff as tribute money. In order to secure the tranquillity of the country and prevent theft by the pilgrims, the government pays subsidies to various people of the mountaineer and Bedouin tribes. Nevertheless, during the year 1857 they were, according to the order of the day, under the maladministration of the Governor-General Mahmoud Pasha.

There are but very few European houses of commerce at Jeddah and in the Hedjaz, but there are a great many Indian merchants who are English subjects. France and England keep consuls there to look after their interests. The Baron could not possibly foresee the horrible massacre of June last.

Besides the port of Jeddah the Hedjaz possesses those of Yembo, Rekal, and Gumfounda, which, however, enjoy but a temporary notoriety from the embarking or landing of pilgrims.

The port of Yembo is without any works of defence, and the inhabitants are mostly of a particular tribe (djcheine). The commerce is limited mostly to provisions. There are not above four or five stores of produce imported from India or Egypt. Cosseir imports to the amount of 18,000 thalers of cereals, corn, hides, &c.: Jeddah 20,000 thalers of European produce. The inhabitants of Yembo have also some eighty vessels. Water is preserved in cisterns situated near the

port of Medina; and the receipts of the customs in 1856 were 5,000 thalers.

As to the port of Jeddah, the most important of the whole Red Sea, some particulars concerning it will be found in our present volume (p. 427) of an extensive nature, the particulars of which agree in all respects with the Baron. In respect of imports we may here remark that Jeddah receives

From *Europe* produce of manufactures, of cloths, mirrors, and iron of all kinds, zinc, lead, copper, antimony, crystals of Venice, hardware of all sorts, crockery, glass, soap, silk and silk tissue of all kinds, tarbouches, &c.

From *India:* Nankin cloths, muslin for turbans and dress, cotton and silk girdles, mixed cloths, silks, sugar, spices, and above all rice in enormous quantities.

From *Africa:* ivory, ostrich feathers, musk, asses, and slaves.

From *Arabia:* especially dates.

From the *Arab Coast:* coffee, medicinal herbs, incense, and wood for building.

From *Persia:* shawls, precious stones, turquoises, rubies, and pearls, carpets, dried fruits, &c.

From *Syria:* keffiën (stuff with which the Arabs cover the head), raw silk, and mixed tissues.

From *Egypt:* cereals, barley, dourra, hides, beans, biscuit, syrups and sugar, coarse cottons for tents and sails.

The port of Goumfoudda as to its commerce is in a state of complete decay. In consequence of the weakness of its Turkish government, the mountain tribes of Assyr have lately made forays to its very gates, and they have so intimidated the Governor, that they trade without paying any duties whatever. The houses are but miserable huts, and it has a trifling trade with Jeddah and Loheia: with the first to the amount of 91,000 thalers it exports country produce; and to Loheia for the manufactures of Europe to about 30,000 thalers. These manufactures are imported from Jeddah to the amount of 150,000 dollars, and are partly exported to Loheia and Masuah, where silver coin is obtained for them.

At Goumfoudda a wretched kind of gunpowder is made, which, notwithstanding its bad qualities, is sold to the mountain tribes at high prices. The receipts of its customs in 1856 were 7,000 thalers.

Yemen.

The Romans called that port of the peninsula to the southward of the Hedjaz, *Arabia Felix*, and Arabian authors, not without reason, designate it by the name of "Pearl of the Red Sea." The riches of Yemen are great. Coffee is grown in the interior to an enormous extent and of an incomparably superior quality, besides incense and the wood of aloes of the first quality.

Towards the middle of the seventeenth century, the historian, Hadji Khalfa, estimated the annual growth of coffee at 80,000 balls of ten farashs (of 200 lbs. each), of which 40,000 were for Jeddah and the

rest for Bassora. If this amount be correct, the produce of Yemen would have been doubled in two hundred years. These exports show the amount of 3,125,000 thalers. The kinds of coffee which are most esteemed are those of Kaukahan, Djebel Duran, Djebel Rema, El Mochader, and Chibam. According to the natives, the production of coffee is susceptible of being much increased. But the goodwill of the people is useless, notwithstanding the promise of so much additional profit, owing to the want of security on the roads, the imbecility of the government, and the rapacity of governors. The use of coffee is unknown in Yemen, and the inhabitants only drink an infusion of the roasted shell, called ghiachr. The country produces a large quantity of cereals and madder. Indigo, cotton, and seasame grow abundantly on the banks of the Thehama, and with a proper cultivation might become an inexhaustible source of riches and prosperity.

At Drehemi, Bat-el-Fakib, and Zebid, there are some fabrics of which futas are made, (coverings for the head,) and redifs (apparel for night.)

At Zebid sandals (nakhel) of hide for the supply of Yemen, the Hedjaz, and Abyssinia. Another industrious pursuit very general in Yemen, is dying cotton blue, imported from India and England. Zebid and Biet-el-Fakih supply the whole border of the Red Sea with milages (blue head-dresses for women) very handsome, and also chemises.

The three political divisions of the country are Assyr, Abou-Arech, and the country of the Imaum of Sana. The coast has fallen under the power of the Turks since they occupied the principal ports in 1849. These last, by the customs returns, produce the sum of 450,000 thalers, and the expense of their government is 180,000, the residue being sent to Jeddah to defray the expense of government of the Hedjaz. The trade of Yemen is carried on through the ports of Djezan, Loheia, Hodeida, Mokka, and Aden. In consequence of the entire absence of European merchants, the exact sums cannot be given, and recourse must be had to returns from those employed in the custom-houses, or the principal Indian merchants.

After this general description of Arabia Felix, the Baron gives details of the ports, for which we may refer our reader to the paper previously alluded to in our May number.

The port of Djezan, in former times of considerable importance, is fallen latterly, 1856, into the power of the mountain tribes of Assyr, who have even attempted to get possession of Hodeida, but were repulsed with the assistance of two English vessels of war. Near Djezan are the rich salt mines of Sahara, which produce 15,000 thalers, although it has a Turkish government. In this year the working of these mines has been completely abandoned, the miners having retired to the country, having received no salary for nearly two years.

Abyssinia.

After a brief view of political events from 1850, and the civil war between Ras Ubie, Chief of Tigre, and Ras Ali, Chief of Amhara

by which the latter took the former prisoner, and was crowned in February, 1855, under the name of Theodore, the first Emperor of Ethiopia; the Baron continues:

The King Ubie having been made prisoner, the country of Tigre fell under the new Emperor Theodore, but the Negus of Choa still refused to acknowledge the newly acquired authority of Ras Ali. After a short war the reluctant Negus was vanquished, and his place occupied by a governor appointed by the Emperor Theodore.

The Emperor meanwhile returned to Amhara to consolidate his power, exhausted after numerous campaigns. Confiding the administration of government to safe and devoted persons, he sought above all for the means of softening and improving his laws and replacing the fear of his power by that respect which he considered indispensible to tranquillity and order throughout his vast empire, and to let his subjects see the manner in which he intended to govern.

There are two acts of the Emperor Theodore which above all others must not be passed over. The first of these is a decree abolishing slavery and the treatment of slaves throughout his empire. The second is an order to all Mussulmans to renounce "the stupid doctrine of Mohammed" and to adopt Christianity.

The promulgation of this last decree was evidently a mistake, an affront against his numerous Mussulman subjects, and Theodore soon found himself compelled to retract it. The wisdom of the first, concerning slavery, would be beyond all praise, but the Viceroy of Egypt had set the example since 1854. Undoubtedly this reform proved the sagacity and wisdom of this autocrat, half civilised as it were, who has done of his own accord what other countries have not done except forced and against their will, after three centuries of opposition to civilised Europe. Besides this superior intelligence the Emperor Theodore showed a marked respect for learning and the knowledge of Europeans. For years he made every effort to attract European artizans to his country, with the view of showing his subjects the advantage of civilization and knowledge. Even when to avoid the evils of civil war arising from religious feeling he found himself compelled to banish missionaries from his territory, he solemnly protested in his proclamations that it was not his intention to exclude from it Europeans, but really invited them with promises of consideration and offers of land and ivory, to establish themselves under his protection, to come and instruct his subjects in the arts of Christian nations.

Respecting the actual condition of the country, Ubie, the old King of Tigre, entirely denied all his pretensions. A part of his dispersed army has been reunited by the mountain chief Agoev or Agoco Negoutie, who occupied the N.E. part of Tigre. The Emperor Theodore would not proceed against these rebels, reckoning on the quarrels which would break out among them. In fact, one of his principal officers at length resisted the arbitrary demands of Agoev, whose bands overran the provinces of Tigre, plundering everywhere as they pleased, their chief not being satisfied without money. The Emperor

determined on chastising these robbers, who were thus ruining the trade of Abyssinia with the port of Masuah. The great caravans only could travel without danger, and they were even obliged, when coming from the interior, to pay four or five endroits, amounting to from a quarter to half a thaler for each mule. The excellent market for merchandize in the interior rendered these exactions of no great consequence. The great obstacle to commerce with the coast is the mountainous nature of the country, where there are only steep paths and these extremely difficult to keep during the rains.

The climate and the vegetation of the country situated under the tropics, but enjoying a moderate temperature on its fertile plains, admits, besides the cultivation of coffee and dates, that of all the fruits of the temperate zone. The mountains abound with all kinds of minerals. Iron and gold are found in the interior, and the principal articles of the country are musk and civet *(viverna Zebetha)*. The horns of the rhinoceros and antelope are exported in considerable quantities, as well as wax and gum. The country derives much profit by the exportation of hides and leather to the opposite coasts of Arabia. Butter* and sesame, as well as oil, are plentiful, and it is the same with mother of pearl and tortoiseshell. Ivory is an article which, with better means of transport, would place considerable sums of money in circulation.

Abyssinia imports red and blue kerchiefs of raw and thread silk, cottons, muslins, glass ware, a small quantity of porcelain, antimony, zinc, iron plates, copper, needles, scissors, knives, tobacco and musk, muskets and sabres. India sends rice, cinnamon, pepper, cotton and cotton cloths, silks, and mixed fabrics.

The imports and exports pass through Masuah, and amount to 435,850 thalers the year.

The Egyptian Coast.

Suakin.—The isle of Suakin, with the town of that name, is situated on the coast of Egypt, in the bay of Suakin, which affords good anchorage. The inhabitants, from six to eight thousand, depend for their subsistence on the town of Ugaff, situated on the main land, and with which Suakin keeps up a perpetual trade. Ugaff, which is of more importance than Suakin, has a bazaar of milk, butter, cattle, wood, and mats in abundance. The commerce of the neighbourhood, which consists principally of cereals, butter, and provisions for Jeddah, is considerably increased latterly by the more frequent communications with the interior of Africa, and especially with Soudan and Darfour. Even the Abyssinian merchants begin to visit the market of Suakin in preference to that of Masuah.

The route followed by the merchants from Gondor to Suakin is

* The shea butter of Africa, obtained from a nut the produce of the butter tree, common to Central Africa, after a considerable process of preparation for the market.—Ed. *N.M.*

first to Waina in three days, thence to Galabat in three days, thence to Gatteref in five days, thence to Rassela (Take) in seven days, and Taka to Suakin in sixteen days, making in all thirty-five days. The advantage of this route, much longer than the old one, consists in being less expensive for the caravans, the transport being effected by camels, while in the mountains only mules can be employed. In the route from Waima to Suakin the caravans avoid the taxes in the interior of Abyssinia, and above all enjoy the protection of an established government.

The goods transported are the same as those to Masuah.

The trade of Suakin is divided between Masuah and Jeddah. The principal article of export, butter, is consumed in incredible quantities on the Arabian coast, and its export amounts to the sum of 210,000 thalers. Suakin exports slaves, butter, salt, coffee, dates, gums, hides, cereals, ivory, gold, cattle, ostrich feathers, musk, and other merchandize, to a total value (excepting slaves) of 354,000 thalers. The imports are, cottons from Masuah, iron, pearls, all articles of hardware, woods, carpets, and arms, the amount of which could not be ascertained.

Kosseir.—The port of Kosseir derives importance from being the granary of the barren Hedjaz. The vessels carry on a regular commerce with Jeddah, Yembo, Rais, Rakel, and other northern ports of the Arabian coast. The exports of cereals amount to 177,000 thalers; that of hides, tusks, stuff for sails, scales of tortoiseshell, amounts to 22,000 thalers, while the imports are 121,640.

Kosseir would become of much importance if the railway projected across the desert of Beni Ouarse with the Nile were effected. The vessels with grain, which always return to the East to Jeddah, might carry there at the most trifling cost the produce of India and Yemen: and the ships of India which repair thither only after some years, would do so more frequently. Kosseir besides is one of the principal ports for the embarkation of pilgrims.

Remarks on the Memorial of the Mercantile Marine.

November 11th, 1858.

Mr. Editor,—If this Memorial of the Mercantile Marine that I enclose is expected to bring about any real benefit to the officers and men of that service, there will be much disappointment; for it is surprising that they should have kept back all their real grievances and shown up only those which are superficial. It does not require forty years' experience of nautical affairs to know what is patent to every officer employed, that the real grievance under which the whole of that service suffers, is, that it no longer affords sufficient remuneration for

its officers, nor holds out the slightest prospect of even a bare subsistence for old age!

This unhappy but real state of things was pointed out some years past at repeated meetings of the most enlightened merchants and shipowners of the port of London, previous to the passing of that Act "the Repeal of the Navigation Laws," by which the British shipowner has been forced into a most unjust and uncalled for competition with foreigners, that has so screwed him down that he is compelled to send his ships to sea at the starvation point, and obliged to carry on a system of undermanning and defective outfit that is perfectly appalling. That is one result, but the effects end not there, for the same system has driven some of the best officers and men to emigration! the former by reduced remuneration for their services, and the latter by imposing upon them more work by undermanning* than is right and just they should have to perform. Nor is this all, bad as it is. The injustice done to the shipping interest generally, has been still further aggravated by a *Merchant Shipping Act*, composed by men wholly unacquainted with maritime affairs: so that evils which the legislature intended to remedy have been entirely overlooked, and no really useful measure introduced excepting the examination of masters and mates, which originated with Admiral Robert Fitz Roy when a member of the House of Commons. The following figures from authentic sources, show the pressure of foreign shipping to which I allude, including all the ports of the United Kingdom.

Total Tonnage of British and Foreign Vessels, distinguishing between each, entered and cleared, whether with cargoes or in ballast, at the Ports of the United Kingdom.

Year.	*British.*	*Foreign.*
1851	9,820,876	6,159,322
1852	9,985,969	6,144,180
1853	10,268,323	8,121,887
1854	10,744,849	7,924,238
1855	10,919,732	7,569,738
1856	12,945,771	8,643,278

Should it now be practicable to apply any effectual remedy to the evils thus brought upon the merchant service, there is, at all events, a better chance of this being accomplished while the present government is in office, inasmuch as they and their friends never lent themselves to that destructive measure which ruined the shipping interest, and threatens to annihilate the maritime supremacy of their country.

We will now read the Memorial, and then consider in detail what are said to be the duties of the Corporation which it proposes.

* Another serious consequence of this system of *undermanning* is evident in the numerous and disastrous collisions continually taking place at sea. How can a *look out* be kept in ships where there are not hands sufficient to perform the ordinary duties? An overworked crew have already more than they can do, without the sleepy duty of keeping a look out at night.

To Her Most Gracious Majesty in Council.

The Humble Memorial of the undersigned Shipowners, Masters, and Persons belonging to the Mercantile Marine Service whose Names are hereunto Subscribed,—

Showeth,

The efficiency of the Merchant Shipping Service is a subject of national importance.

To insure that efficiency, the Officers must be men of education, character, and intelligence.

To these qualities should be added a high bearing and courteous demeanour; for, in remote countries, a Master of a Merchant Ship is the representative of his nation; and the goodwill of a people may be conciliated by his forbearance, or their hostility provoked by illjudged measures or intemperate severity.

Moreover, science requires that an Officer of the Mercantile Marine should possess sufficient knowledge to observe accurately, and detail intelligibly, the physical phenomena which necessarily pass under his observation in the course of his ordinary duties.

Officers, possessing all the requisite qualities, abound in the Merchant Service; but, as they have no means of acting in concert, the profession generally derives but little benefit from their influence or example.

The object of your Memorialists is to remedy this defect, by creating a recognised body as the accredited organ and representative of the entire service.

Your Memorialists, therefore, pray that your Majesty will be graciously pleased to grant your Royal Letters Patent, forming your Memorialists into a Body Corporate, under the title of the Royal Mercantile Marine Service, having a perpetual succession, and a common Seal, with power to hold lands.

Your Memorialists are Shipowners, Masters of Merchant Vessels, and persons in the Service, and belong to the various ports of the greatest mercantile importance in your Majesty's dominions.

Your Memorialists propose that the Corporation shall consist of a Council, Assistants, and Associates.

The first Members of the Council shall be the Members of Parliament hereinafter referred to, and also the following persons:—

One sixth at least of such Members of the Council as are not Members of Parliament shall vacate their offices in annual rotation, but shall be re-eligible.

The future Members of the Council shall be chosen by ballot from among the Assistants by the Assistants and Associates.

The Members of Parliament for the time being of each Port in the United Kingdom in which Local Marine Boards or Local Mercantile Marine Service Associations shall exist, shall (when consenting thereunto,) be Members of the Council Ex-Officio.

The Assistants shall be Shipowners, Masters of Merchant Vessels, and persons belonging to the Service who shall pay One Guinea or upwards per annum to the funds of the Association; and any Assistant ceasing so to pay shall thereupon cease to be an Assistant.

The Associates shall be Shipowners, Masters of Merchant Vessels, and persons belonging to the Service who shall pay Five Shillings or less than One Guinea per annum to the funds of the Association; and any Associate ceasing so to pay shall thereupon cease to be an Associate.

The Council shall have power from time to time to vary the amount of subscription necessary as qualification for Assistant or Associate, provided that such variations shall only affect cases respectively subsequent thereto.

The Council shall have power to accept from persons desiring to become Assistants or Associates donations of such amount as the Council shall think proper in lieu of an annual payment, such donations to qualify for a term of years or life as the Council, in each case, shall think proper; and the Council shall also have power to nominate from time to time to be Assistants, without payment, any persons who, whether on account of position or distinguished merit or otherwise, they shall consider deserving thereof.

The Council will have power to elect its own Chairman and Officers, to add to and to fill, *pro tem.*, vacancies in its body. It may also from time to time appoint Committees.

The Council will make Bye-laws for the regulation of the Corporation, and will exercise all its powers, but shall make a report of the state of its affairs, once at least every year, to the Assistants, who shall be convened for the purpose of receiving and deliberating on the same.

The duties of the Corporation will be:—

1st.—To elevate the social position of the Officers and Men belonging to the Mercantile Marine, by taking means for their superior education, and the advancement of ability and character, and the better discipline of the Merchant Service.

2nd.—To reward Officers and Men of the Mercantile Marine for long and able service, for brilliant acts of seamanship, for saving life or cargo, for discoveries, inventions, or other contributions to the Service.

3rd.—To provide refuges for aged and worn-out Officers and Men of the Mercantile Marine.

4th.—To establish schools, afloat and on shore, for the education and training of boys and men for the Service.

5th.—To establish institutions for the advantage of Seamen; and to publish, or assist in the publication, of any books, maps, charts, plans, or other works, for the use of the Mercantile Marine.

6th.—To raise funds for the carrying out of these objects.

And generally to do anything, although not falling within the list of the above duties, that may conduce to the improvement or social elevation of the Merchant Shipping Service, or to the instruction, benefit, or happiness of the Officers or Men engaged in that Service.

Let us now consider these duties.

"1st.—To elevate the social position of officers and men belonging to the mercantile marine, by taking means for their superior education, and the advancement of ability and character, and the better discipline of the merchant service."

Now to elevate the position of officers, one most essential point is, that they must be *much better paid* than they are at present, or men of education will not be found to enter the merchant service, or, at all events, to remain in it. With respect to the men, they must have less work, more space and accommodation on board the ships than they have at present, and the introduction of foreigners should be limited to one fifth of the crew. Ships should also be properly manned according to a scale requiring a certain number of foremast men to every 100 tons as formerly. The discipline of the merchant service will best be improved by a total repeal of those clauses in the Merchant Shipping Act miscalled Discipline, from 239 to 290, and in remodelling the whole matter by a committee of experienced and independent nautical men, who would take good care not to omit, as that Act has done, the most ordinary offences which occur, offences and crimes that

are most common and notorious at sea, such as insolence to officers, drunkenness, theft, mutiny, piracy, and barratry:—these most serious offences are not even mentioned by name! Indeed the whole spirit of the articles abovementioned tends to undermine the authority of the commander and officers instead of maintaining it. By these laws a commander is a mere cipher in his own ship! It may well be said that "they manage these things better in France," as will be seen by the *Décret disciplinaire*, recently published in your pages, Mr. Editor, a document which is well worth the attention of any one whose business it is to make laws for merchant seamen, or who is in any way interested in these subjects.

The second point asked in the Memorial is,—"To reward officers and men of the mercantile marine for long and able service, or brilliant acts of seamanship, for saving life or cargo, for discoveries, inventions, or other contributions to the service."

An excellent and well intended request, which it is to be hoped will be met by ample funds found for that purpose.

"3rd.—To provide refuges for aged and worn out officers and men of the mercantile marine."

Another excellent intention also, although the plan of *out*pensioning seems the most congenial to the present time. The plan, however, requires enormous funds, when we consider that it takes £200,000 per annum to pension 20,000 men at the small annuity of £10. The condition, however, of a *joint service in the royal navy and merchant service*, might induce the government to aid largely in such a measure. A service of ten years in the navy and ten years in the merchant service, should entitle a man to £16 per anuum. A committee of naval officers and commanders of merchant ships, would soon contrive such a plan as would insure an ample supply of seamen to the navy by these means.

"4th.—To establish schools, afloat and on shore, for the education and training of boys and men for the service."

It is to be hoped that the education will comprise those essential qualifications in which seamen of the present day are so often deficient, viz., to hand, reef, and steer, and heave the lead.

"5th.—To establish institutions for the advantage of seamen, and to publish any books, charts, plans or other works for the use of the mercantile marine."

No better charts will be found than those provided by the Admiralty for the royal navy, and sold at a really cheap rate by Potter, 31, Poultry, London.

"6th.—To raise funds for the carrying out these objects."

This will be the most difficult part of the whole plan. In fact, without a large subsidy, either from the government or mercantile marine fund, the proposed benefits could scarcely be carried out at all.

"And generally to do anything that may conduce to the improvement or social elevation of the merchant shipping service," &c.

The intentions here are also most laudable and excellent; but when we see how the shipping interest is borne down by more preponder-

ating influence in Parliament, it is almost hopeless to expect that any effectual scheme will be carried through that house. The manner in which the maritime interest in this country has dwindled down, is well exemplified by the fact that at the present moment, in a House of Commons consisting of about 660 members, there are not more than *nine* individuals who are by profession nautical men! viz., five naval officers, two commanders of the East India Company's service, and two of the general merchant service.

If any revision of the Merchant Shipping Act is to be accomplished, the following improvements should be kept in view; viz., 1, the scale of manning; 2, a limitation as to foreign seamen; 3, the establishment of Maritime Courts for the trial of all offences and crimes committed at sea or in harbour, except in cases of piracy and murder; 4, the re-establishment of the apprentice system, and 5, a practical code of laws for the maintenance of discipline on board.

With respect to the burthens on shipping, the light-dues on the *coasting trade* should wholly cease, the railways having nearly ruined it. But in the *foreign trade* it would be no relief if foreign vessels were also exempt, as the same pressure from foreigh competition would still exist as before. Foreigners now pay about two fifths of the light-dues, so that it is a farce to suppose that the general abolition of those dues would place British ships in any better state than they are now. British shipping do not pay above £180,000 per annum, which, coming from thirteen millions of tons, would be contemptible in amount to each. To talk of doing away the light-dues to benefit British shipping, is a piece of that cant and humbug which distinguish these times from all others. The vexatious mode, however, of levying the tolls might be remedied by adopting the French plan, which is, to levy a general tonnage duty. Although the French profess to maintain their lights form the public revenue, yet the foreigners pay them 50 per cent. more than they pay us, though under another name. If any one enters a French port in any vessel but a man-of-war or yacht belonging to a royal yacht club, one franc per ton is invariably levied. Consul's fees, together with those arising from the examination of masters and mates, and those charged at the Shipping Offices, should cease.

Unless some powerful and effectual effort is made either by the Government or influential members in Parliament, to secure these objects, the British merchant service as a profession, with the exception of the large steam companies, will very soon be annihilated. The steam companies must keep up a stock of first rate officers, with sufficient reserves, or, as they know well enough, they will soon lose their valuable and uninsured vessels, and the country must then bear the expense of an enormous standing military marine, and for the manning of their ships they must trust entirely to their own resources.

I am, &c.,

TRIDENT.

To the Editor of the Nautical Magazine.

Cochin China.

Leaving Macao on the 3rd September, we arrived on the 5th at the S.W. extreme of Heu Naun, and anchored for the night in the commodious bay of You-Linn-Kaun. But we learnt nothing there of a nature to assist us in the accomplishment of our object. We left again the following evening and on the 7th saw Tiger Island, some leagues to the N.E. of the river Hue. We dropped anchor off the coast the following evening, and on the 8th September, continuing along the coast of Cochin China, we entered the bay of Boung Quiona, already ascertained by *La Favorite*, in March, 1831, on her voyage round the world, to afford secure anchorage.

We landed quickly, and that evening could only find a fishing hamlet; but at the same time we ascertained that in a neighbouring village we should find some foreigners who were Christians and a priest. Accordingly we were *en route* early next morning, and first crossed over some tolerably high hills covered with brushwood, then a river, happily not very deep, then a morass, and about two miles over sand-hills.

All our trouble, however, was of little use. It is true we found two Christians, but they told us that the priest of whom we were in search, and who by description we were led to believe was Mgr. Diaz, resided at a place eight days' journey from them. At the same time this little excursion has enabled us to observe a fact which has been apparent throughout our journey every where. Whilst the native pagans fled at our approach from fear and want of confidence, the two Christians received us like brothers, serving us as guides and interpreters without taking anything from us until it was forced on them. We had abundant opportunity also of examining in detail their repulsive dwellings, in which our poor missionaries to the Annamite kingdom are obliged to reside for two or three months without going out. The dormitories of your convicts in France are luxurious in comparison with these filthy, infected cabins, a good many of which we visited.

The bay of Boung Quiona appears to be situated at the extreme limit of what is properly called Cochin China. Departing on the 10th September, the *Catinat* followed the *Lily*, and we sailed slowly along the coast of Tonquin, and again cast anchor in the evening at sea.

On the 11th we arrived in a bay very open to the southward, but pretty well sheltered in the opposite direction, from whence the wind is the only troublesome one in the gulf we were in. On the following morning we landed with two boats before the sun was up near a river and a town which we had discovered when it was about ten leagues from us. It was soon found to be very large and that its name was Li: the river which flowed by it was called Kann; and scarcely had we landed and entered the public house when we found ourselves surrounded by a Christian populace. The first information

they gave us was that Mgr. Diaz had been decapitated at Naun Ting on the 29th day of the 5tr, which would be on the 20th July preceding.

We therefore determined to proceed in search of the town which had been the scene of the martyrdom of the Spanish Bishop, as he had seen, in 1851 and 1852, the prayer of two French missionaries M. M. Schuetfler and Bounard. All that was necessary was to obtain pilots who would conduct us, and unfortunately we were unable even to obtain one. Not all our entreaties had any effect on our Christian friends, nor were the most liberal promises of any avail to obtain us pilots. The people turned deaf ears to our applications, and the boats which had saluted us with shouts of joy in the morning had disappeared as if by enchantment by the evening. Some power invisible to us had banished them from the scene, and we could only discover that Naun Ting is much further to the North, and that it would be necessary to continue for three days and nights along the coast before we could see it from the mast-head of our steamer.

We therefore resumed our route on the 13th at daylight, and anchored in the evening at Taun-Meunn. Our sudden appearance in this bay seemed to produce an effect on the numerous fishing vessels scattered about it. They all made for our steamers, and we soon found ourselves surrounded by them, and in the noisy manifestations of their joy we soon discovered that they were Christians and friendly inclined. In fact a boat very soon after resolutely approached the *Catinat*, and some seven or eight of her people, who were fishermen, were seen prostrating themselves at our feet in tears. One of them, an old man, had served as a soldier in Cochin China, and, having in 1844 assisted our ships, conducted by the *Victorieuse*, in destroying the Annamite vessels at Turan, knew the French flag very well, and had signalled his companions that he saw it. In about an hour they left us, gratified with their visit, assuring us that they would very soon send us a native priest. He came in the course of the night, attended by two or three catechists and a dozen Christian natives.

He called himself Andre, and althongh his feet were bare and he was miserably clad, there was a dignity about him which we could not fail to admire. He remained on board a great part of the night, gave us a sad account of the persecutions of the Christians, and confirmed the death of Mgr. Diaz. He promised us pilots to take us to Naun Ting, spoke of the Emperor of the French, and appeared much moved when he was told of the interest which his Majesty entertained for the poor Annamite Christians. Every one who had accompanied him well knew the name of Napoleon, cheering as the sun, and the priest wrote it for us in Latin and Chinese.

In the course of the day the pilots arrived, and after bidding farewell to Father Andre we prepared for our departure, when the look-outs signalled the approach of a number of boats to the *Catinat*, which vessel they had boarded. The first glance at these new visitors led us to believe they were mandarins. No sooner were they on

board than they seated themselves at table without the least ceremony, and commenced making inquiries of the interpreters, apparently with much impatience. Two of these persons seemed to be the principals of the whole. "Who are you?" demanded the captain of the *Catinat*. "Teachers of the Chinese language at the town," answered the two mandarins. But they spoke falsely. We were too late, for our catechists and pilots told us they were the prefect of the department Ho-Tchong and the magistrate of the district of Heo-Lou, who had thought fit to pay us a visit *incog.* Their questions were then put by them without hesitation or delay.—"Where did you come from? What do you want? Are we among friends? What news have you of China? Had we large forces there? Did we occupy it? The coasts of Tonquin were very dangerous; there was very little water in the rivers; the country was very poor. The French were known all over the world as a very chivalrous people; but they were very quick and easily affronted. The great French empire was very rich and the people wanted nothing,—Why did the French take the trouble to go to sea? To trade is only necessary for people who are dying of hunger, but the French, who are loved so much, everything is at their command. Oxen, goats, poultry, cattle, vegetables, and fruits they have only to ask for. But the weather was threatening, and there would soon be a typhoon: the gulf would then be an abyss of storms." And our mandarins recommended us not to expose our ships to danger, a circumstance which gave them much concern, and they considered really that we should go away.

Our informants knew of the death of Mgr. Diaz, or rather of some stranger. They had heard him spoken of, but certainly the governor of the town was ignorant of his nationality or how could he have put to death a Frenchman or a Spaniard. That could never be. There had come to them vagabonds who had introduced themselves at Tonquin under all kinds of pretexts, and were revolutionizing the country. Now the individual who had been executed on the 20th July had been one of these in all probability. Again, how could the Governor-General of Nan-Ting, who was old and well experienced in matters, as well as brother-in-law of the Emperor,—How could he commit such an act? The Cochin Chinese desired to live in peace with all the world, with France, and especially with Spain, and it was of no use for our steamers to go to Naun-Ting. So, after having kept up all this kind of conversation, they left us with abundant assurances of respect and friendship.

We therefore did not persist in the project of going to Naun-Ting, and on the following day, the 13th of September, we left the bay of Taun-Meunn.

We had considerable difficulty in arriving at this part of the bay where we were. We had to make a long detour to avoid the sand-banks which obstruct the mouth of the river Nan-Ting, and the *Catinat* grounded twice in entering. To add to our troubles, the two

pilots of Taun-Meunn, alarmed at our accidents, would leave us, and we did not care to impose restraint on them. Nevertheless we managed to anchor in the evening four or five miles off Balat.

The following day we determined, if possible, to enter the river, or at least to approach it. We observed a collection of fishing-boats about a league ahead of us and steered for them. Two of them quickly made off as soon as they found we were approaching them, while the rest waited for us. A father returning home after several years of absence to the bosom of his family could not be received with greater expressions of joy, even to tears, than shown by these poor fishermen as we arrived among them. Indeed, we could scarcely refrain from similar expressions of feeling, and as soon as they had subsided all the boats started off to spread the news of our arrival.

We then attempted to enter the river by a long and difficult navigation. But we entered it at half-tide, and soon found the water shoal and ourselves surrounded by sand-banks. We could only find six feet, while the *Lily*, the least of our vessels drew six and a half. It was probable that in an hour or two more our pilot would be able to pass, but it was evident that, he not knowing the channel, if once the *Lily* was on shore in the river, she would not be able to leave it at pleasure. As we were deliberating on our situation, one of the two boats which left us returned under oars. The people in her told us that the mandarins had collected troops and war junks at Balat, and that in continuing up the river we should run the risk of finding the channel blocked up on our return, as they were in the habit of doing. Therefore, since the object of our expedition was at an end, as the bishop was dead and our proceeding onwards could be of no use, we gave up the project of continuing, and returned to our anchorage.

It was well, however, to wait a day or two longer to obtain any intelligence of our missionaries; and our expectations were not disappointed, for on the 19th we received a letter from Mgr. Melchoir, the successor of Mgr. Diaz, full of sad accounts relating to the situation of the Christians at Tonquin. The spirit of persecution was in full force every where and exercised with increased vigour. Whole villages of Christians had been burnt and razed to the ground, and their unfortunate inhabitants either beheaded or thrown into prison. Many had died with heroism in the midst of these barbarities, and a Christian mandarin of high rank had been lately executed at Hue. Mgr. Melchior ended his letter with bitter expressions of distress, and, despairing of help from man, he could hope for relief only from God.

However painful it was to abandon our unfortunate countrymen in the midst of so much adversity, the time assigned us for the expedition was nearly concluded, our stock of fuel was nearly gone, and with sorrow we turned away from the road to Balat on the 22nd of September. The weather, which had hitherto been most favourable, suddenly changed and obliged us to take refuge for some days in the

bay of You-Linn-Kann and at Tinhosa, at the S.E. end of Hai-Nann; which latter anchorage we left on the night of the 28th September, and arrived at Macao by daylight on the 3rd of October.

In a letter which a venerable ecclesiastic of the environs of Lyons has received from Mgr. Retord, Vicar Apostolique of Tong-kin, Occidental, he furnishes some information of the interior of Cochin China that cannot be too widely known.

When, in September, 1856, the Annamite Emperor learned that a French squadron was off Cambodia, he suspected they might come to Cochin China. A royal circular immediately announced this suspicion to the principal mandarins, and, as is well known, he avoided all communication with us and adopted every means to induce us to leave the country, "for," said the King of Cochin China, "these people are very corrupt and ignorant, they show no learning from their ancestors; under the appearance of religion, they are dogs, and they have the courage only of goats; they traverse the sea like pirates, carry on their refittings on desert islands, where they conceal themselves on coasts in the secrecy of the valleys, and from them foment troubles and revolutions in the neighbouring countries. It will therefore be a disgrace and a calamity to our country if we receive them."

The reader will remember our people at Turan at the end of 1853, the refusal of the authorities to receive our ambassador, and to furnish provisions to our people. In fact, the demolition of the forts of Turan by the corvette *Le Catinat*, after which the mandarins hastened to attend to our messages and to supply the provisions which we required.

But at the same the Annamite Emperor, fearing the unfavourable effect which this might produce on his people if they were really known, hastened to forward to the governors of the provinces a new circular, which said that, "As had been foreseen, the barbarians of Europe are come with a fire-ship even to the fortress of the capital, but they are soon gone, having escaped after a well merited chastisement. There is no necessity, therefore, to be troubled any further about them."

In the month of October following the French corvette *Capricieuse*, commanded by the gallant Captain Collier—who fell afterwards under the walls of Canton, took her turn in appearing before Turan. This time the king was aware of his position, and showed himself ready to afford us all we required to satisfy our wants. But this conduct was only the usual policy of the Chinese; he wanted to gain time.

In the mean time the king concentrated his troops and collected supplies at Tong-kin. He constructed batteries, he blocked up the entrance of the river leading to the capital, Hue, so as to leave room enough only for one ship at a time to pass between two armed forts.

In fact he prepared brulots of dry bamboo to send with the assistance of the current against the ships, in case they should attempt to come to the capital.

The *Capricieuse* announced the arrival of the French diplomatic agent, but M. de Montigny, detained by bad weather at Singapore, could not reach Turan until the 23rd January. The king took the opportunity, says M. Retord, to organize his defence, and obtained instructions from Pekin that encouraged him to resist. He was therefore careless about treating with the French ambassador, who, soon called away to other parts, was obliged to content himself by informing the Annamite King that he should soon return, and if on his return he found that in his absence the Government of Cochin China molested the Christians or any other person connected with the French embassy he would have to render a strict account of it.

Unfortunately for our co-religionists, the king, seeing the interest taken by France towards the Christians, concluded that they had summoned assistance, and their persecution was recommenced. Their sufferings appear to have been the more severe from having expected relief. Mgr. Retord describes in these striking terms the impression which our ships had made on the Christians and even on the heathen: "It is well that we are going to be delivered from this corrupt and tyrannical dynasty! Thanks to France, we have a paternal government. Her glory, her riches, and her industry extend to this country, and we shall be delivered from our misery and the degraded condition in which we are."

Among the people who suffer daily for their faith every species of oppression, hopes of delivery are no less strong. "Thus," adds the venerable prelate from whom we have these details, "the desire which every one has for the downfall of this tyrant leads to the invention of the most fantastical stories, and the most extravagant ideas are believed. The ambassador had only, they imagine, to fire a single gun to destroy the fortification of his capital. His fall was announced to him by the most sinister auguries. In the evening an unknown bird in its heavy lugubrious flight came and extinguished the flambeau which lighted the royal saloon; one of the most beautiful of the king's elephants had escaped: a ball of fire had fallen from heaven and spread destruction in its path."

The *Moniteur de l'Armée* says,—Our information relative to the expedition to Cochin China has been confirmed by the appointment of Admiral Rigault de Genouilly to the command of the expeditionary troops, military and naval, which are to be sent there. A small body of Spanish troops is in addition, it appears, to be supplied by the Captain-General of the Philippines.

The various grievances of which the French Government has to complain have been more than once mentioned separately, but have not, we believe, been enumerated altogether. The empire of Annam

comprises three principal divisions, Cochin China, Cambodia, and Tonking. The Emperor Gia Long, in 1785, on the demand of France, agreed that the Christian religion should for the future be freely exercised in his states. His successors have, however, treated that stipulation with great contempt, and for the last thirty years the Christians in their states have been cruelly treated. French and Spanish priests, in particular, have been odiously persecuted, and in 1857, Mgr. Diaz, a Spanish Bishop, was put to death at Tonking by order of the Emperor Tu Duc, now on the throne. That circumstance it is which has called for the intervention of Spain. France, desiring, as becomes a strong and powerful nation, to attempt conciliation, sent, in 1857, M. de Montigny to Cochin China, to propose a treaty of friendship to the Emperor of Annam. The mission of that gentleman having failed, the court of Hue, capital of the empire, having refused to receive him, and even to return any reply to the letters of which he was the bearer. In presence ef these grievances, and of others of the same kind, which aggravate them, France has been obliged to take the decisive part which has just been adopted.

We are assured that the expedition will disembark in the bay of Turan, which forms part of the territory ceded to France by the Emperor Gia Long at the end of the last century.

A Tour among the Tahiti Islands,—*in H.M.S. "Vixen,"—with the King and Queen.*

Not having had an opportunity of leaving Oahu for some considerable time before, I gladly availed myself of the chance of revisiting a few spots on the windward islands, by accompanying their Majesties during their recent trip on board H.B.M. steamer *Vixen*. Our party, though not large, was very well met; and we felt particularly thankful to the King and Queen for having invited us, in their wake, to enjoy the hospitality of Capt. Mecham. The last named gentleman being still in port,* I do not feel at liberty to express, in such terms as I could wish, the sense which every stranger on board entertained of the attention and politeness bestowed on all of us by him and his officers; suffice it to say that whatever could be done to make the trip agreeable was done, and in such a way that we could not perceive any signs of the inconvenience to which we must, of course, have subjected our entertainers.

* These desultory recollections of the pleasantest trip I ever made were commenced before the occurrence of that melancholy event which has removed from the service and his friends one of the most talented and rising commanders in the British Navy. The death of no one known here only for a few months ever created so general and keen a feeling of regret as that of Capt. Mecham.

The weather seconded their endeavours in the noblest manner; by neither wind nor rain were we annoyed, and the usually restless ocean lay still as if in expectation of the royal passers by; his waves lying hushed like a prostrate crowd in those old times when at the approach of a mighty chief everybody threwthimself upon his face and kept such silence as is observed in a Roman Catholic Church at the raising of the Host. Now my matter-of-fact friends must not take me too literally, and suppose that I believe the winds and the waves to be courtiers; I am merely stating a fact in a round-about way. The ship's log would show a record of the same circumstances, though in terser terms.

During an absence of three weeks we did not meet with a single adventure, neither our party nor anybody connected with the ship, and everything went on in the most regular and orderly manner. When we left one place, the captain would gather from the King his wishes as to the time of our arrival at the next place, and when the hour came we were there. Think of that, you who have had occasion to move from island to island! Think of it when next you lie becalmed under the scorching sun, unable to escape the savour of cockroaches and bilge-water with which your conveyance infects even the pure atmosphere of the mid-channel! Think of it you whose bill will be protested if the vessel does not get in before twelve o'clock, and you whose very existence, in a commercial sense, depended upon your catching the packet for San Francisco which you see filling away to make a good offing just as you, at last, round Diamond Point. It is very ridiculous to blame the government for not having procured steamers, as if steamers, like other beatitudes, were to be had without money and without price; but steamers there must be to ply between the islands. The loss of time and patience experienced on board of sailing coasters, is something that does not properly belong to this nineteenth century. It is as incongruous with the general order of things as a gentleman with a peach-coloured coat would be in Wall Street, or a lady with powdered hair and patches of court-plaster on her cheeks, who, so attired, should take the air in a sedan-chair to the unutterable astonishment of Rotten Row. Instead of trying to analyse the reasons why we have no steamer, or to discuss the history of a defunct company, it would be better, in accordance with the spirit of the times, to be up and doing. It seems to me that a good many shares in two steamers would be taken up if the cost of each share were made very moderate, indeed, say ten to twenty dollars. Some people would subscribe their names, not for the dividend they expected to receive, but for the convenience. A single trip to Hilo on board of a steamer, as compared with the ordinary run of such coasters as we have at present, would certainly save any man of business, whose business was worth his time and trouble, the value of one or two shares. Those who have to move about frequently, might very well, after the lapse of a year or so, present their shares to the body of the stockholders and still be gainers by the transaction. Is there any man among us who does not value his time at least at five dollars a

day? Let some of you calculate how many days in a year you would save if there were steamers running regularly between our different ports, then turn the time into money, and then see whether you would not take a few shares to help on the propitious day when man in Hawaii as elsewhere shall be inconvenienced neither by head winds nor calms. Having on our late trip had an opportunity of watching the movements of some three or four coasters, and having indulged in a feeling of sincere pity for the passengers on board of them, I write quite tenderly on this subjest.

We left here on the evening of Thursday the 21st, and passing to leeward of Lanai, arrived in Lahaina next morning between eight and nine o'clock. We had to go very slowly for fear of surprising the good folks in the arms of What-do-you-call-him. I cannot say that I observed any particular changes in the appearance of Lahaina from the roadstead, but it looked as pretty as usual, for the long fringe of trees coming down to the water's edge, gives the former seat of government something of that beauty which is characteristic of the Tahitian Islands. The Seminary buildings on the hill did not appear to have shifted their positions, nor did I observe, on looking through a glass, that modern innovation had so far conquered prescription, as to effect any repairs in that wilderness of rooms which people will persist in calling the Palace.

In the left of the town as you look at it from the sea, and a short way up the road that leads to Lahainaluna, there has recently been erected a Roman Catholic chapel, prettily conceived and neatly executed. No inconsiderable amount of taste has been displayed in its design, in both its outward and inward portions, and, as a whole, it will certainly bear comparison with any house of worship that I have ever seen on this group of islands. It is said that all the labour bestowed upon it from beginning to end, has come from three Frenchmen, whose industry and zeal are fully repaid in the happy result. The edifice, which is now nearly ready for consecration, lies East and West, and in many other respects contrasts with the general run of churches here; but whether an empty oblong of mason work set down in any direction to suit the peculiarities of the building lot, a thatched roof, and benches innocent of paint, may not be as acceptable a place of gathering for worship as the most ornate chapel, is a point on which every one has a right to have his own opinion. Some people say they do not like to show towards a heavenly less respect than they do to an earthly visitor, for the last of whom they generally tidy up their rooms as a matter of courtesy and a sign of welcome; but it is all a matter of feeling. Of course there are many persons who hold that it evinces a more genial feeling to ask a friend to drop in when he likes and take pot luck, than to extend to him a formal invitation, which renders incumbent the use at table of the best set of crockery and the silver-plated side dishes.

After breakfast the gigs were called away and we went on shore. This was on Friday. The old landing place at the mouth of the canal is not used now, the sand having choked up the passage, so you beach

your boats immediately in front of Gilman & Co.'s store. Of course we stepped into this latter emporium to pass the time of day and ask for the news. It happened to be the 'tween seasons, and very little business doing. I soon discovered that, as usual, the subject which engaged the local politicians was the butchers' shops. I have known Lahaina for many years, and been there very often, but I never remember the time when those butchers' shops were not the subject of intrigue if not of open dispute. I cannot account for it. There is a veil of mystery hangs over those establishments. But the fact is as I state it. Having heard a good deal of talk about neglected Lahaina and pampered Honolulu, I made it my duty to inquire into the woes of the former place. To my surprise I was told by one of the first men in the town, a gentleman whose interests are entirely identified with its own, that all they, the people of Lahaina, wanted of the legislature in the way of money, was a small appropriation to clear away some stones which made part of the breakwater, and now lie more or less submerged according to the state of the tide. These impediments being removed, it is supposed that the sea, in washing in between the beach and that portion of the breakwater which still remains to the good, will clear away the sand which now threatens to render inconvenient the landing place I have already mentioned. From that spot runs the lane or street which leads to the well whence the shipping derive their supply of water, and it is of great importance to the general interests of the place that nothing should incommode the landing of casks there.

There is one thing more they want, but instead of drawing upon the Treasury it would enrich it. They want a retail spirit licence. Those men who are not fanatics, and who possess eyes that can see a little beyond the ends of their noses, look with something of contempt upon a policy which gives birth to a nasty, low, nefarious traffic in ardent spirits of the most debased description. It leads to a constant breach of the law which no surveillance can prevent, for these illegal dram-shops originate in a diseased policy, and like ulcers in a patient whose disease is in his system, no sooner is one driven in than another breaks out. As I understand it, there are in Lahaina, when the ships are in, some sixteen or twenty dirty holes where spirits can be bought at retail on the sly. The men who pursue this risky trade having, in order to take advantage of a demand which a fatal policy says shall create no supply, undertaken to brave the authorities, it is not surprising that they add another step to the initiative one, and abuse their customers by selling them the vilest compounds. As excessive duties lead to smuggling, so will too much tightening of the cords that restrain personal liberty produce a snapping of them, and, as long as there is anything that one set of men will have, there will always be another set of fellows to supply them with it so far as it is procurable. The abstract question of temperance has nothing to do with these remarks; whether licences be granted or not granted for Lahaina, the amount of drinking, or rather liquors drunk, will be the same.

The advantages of one system over the other may be principally resolved into these three heads. 1. With licences the law of the land would not be systematically broken by a set of men who enter with due consideration and after making the nicest calculations upon what amounts to a gambling transaction. 2. Public health as well as public morality would gain by having a licensed vendor, with a bond staring him in the face, to retail spirits in which if deleterious matters were found the offence could be traced home to him. But two licences would be preferable to one, because the man who sold the purest articles would in all probability secure the largest custom and clear the most money. 3. Those who frequented a licensed bar would be seen, whereas the sly system often superinduces the vice of lying to that of tippling, particularly amongst those who have a character for temperance and sobriety to maintain. This position is happily illustrated by the members of those churches in which the eleventh commandment forbids the use of tobacco, for it is well known that they never smoke except behind the curtain.

It would appear that the duties paid in Lahaina for spirits taken out of bond during the last fiscal year, amounted to 7,122 32 dollars. This equals the impost on about 1,424 gallons. Add to this amount of gallons all that was shipped from Honolulu in the same period and upon which the duties were paid here,—an amount that could hardly be arrived at without examining the books of our wholesale spirit merchants,—and you will begin to form some idea of the quantity of spirits which those five or six foreigners in Lahaina must consume, who buy a dozen now and then for their own use and that of their visitors. They must drink gallons where we of Honolulu drink glasses! But if they do not use these stimulants, pray, who does? And echo answers, Who? Is it possible that an illicit trade can be so flourishing? If it be, I will in turning from this subject make one remark, to wit, that public morality will gain in some degree if things are hereafter spoken of as they exist,—misrepresentations may compass a temporary purpose, but can never lay the foundation of that which is destined to be permanently beneficial.

Next week I will, if nothing more important shuts me out, pursue these random recollections.

C. G. H.

The Polynesian.

The Late Commander George Frederick Mecham, of H.M.S. "Vixen."

On Wednesday evening at 9.17 p.m., died on board H.B.M. steamer *Vixen*, lying in the harbour of Honolulu, George Frederick Mecham, Esq., Commander of that ship. It is hardly necessary to remind our

readers that Captain Mecham had returned, no longer ago than the Friday preceding his decease, from a trip to windward, during which he had been the hospitable and courteous entertainer of their Majesties and their suite. His sudden demise, after an illness of three days, has created in this community a feeling of melancholy and regret for which we look in vain for a precedent in the case of one so comparatively a stranger. The undisguised sorrow evinced by the officers and crew of the *Vixen* gives unequivocal proof that those qualities which we saw to admire in him were only more fully appreciated by those who knew him longer than we. Very few men possess the happy faculty he did of blending firmness with consideration and the kindest regard for those entrusted to his care. The cause of death was bronchitis.

Captain Mecham was only thirty years of age, his baptismal certificate having been signed by the Rev. Charles Leslie, Vicar of the parish of the Holy Trinity, in the city of Cork, on the 14th of November, 1827. On entering the service he first joined the *Ardent*, Captain Russell, as a volunteer of the first class. This was on the 2nd of September, 1841, and he remained in that ship till the 23rd of October, 1845. He then served as a midshipman on board the *William and Mary* till the 14th of December of the same year. From the 15th of December, 1845, to the 26th of April, 1846, he was in the *St. Vincent*, still as midshipman. His next ship was the *Constance*, where he remained under two captains from the 27th of April, 1846, to the 31st of December, 1847. It was during this commission that he first visited these islands, having been on board when the late King, with his Queen and suite, proceeded in the *Constance* to Kauai. From the 1st of January till the 26th of May, 1849, he was acting lieutenant on board the *Asia*. On the 5th of March, 1850, he was appointed to the *Assistance*, and remained in her till the 9th of October, 1851. After that he proceeded to the Arctic, and in the list of distinguished services we find the following notice:—

"G. F. Mecham promoted for Arctic services in the expeditions of Captains Austin and Belcher, 1850—4, during which he made the longest overland search on record."

Captain Mecham was so little accustomed to speak of his own services, that we have been unable to procure any further particulars of his career than that after having had command of the *Salamander* steamer for a while. he with the whole ship's company, was transferred to the *Vixen;* but his conversation and deportment bespoke a man of perseverance and ability, devoted to his profession, and gave to even his casual friends the assurance that quick promotion and a career of honour awaited him. A feeling of surprise was mingled with one of regret when the news of his death transpired, for upon his fine muscular frame and apparently robust health he was often congratulated, and more than a few who now survive him, were almost inclined to envy his prospect of a long and vigorous life. As a consequence of his decease, upon Mr. Lewis J. Moore, the senior lieutenant, has the command of the *Vixen* devolved.

The remains of the deceased were landed at Charlton's wharf yesterday afternoon at three o'clock. As the coffin left the *Vixen*, that vessel commenced firing minute guns to the number of twenty; the *Alcibiade* then fired the same number, and to her succeeded the fort. Thus minute guns were fired for an hour. The funeral procession was formed in Queen Street. The band playing a dead march preceded all! the Honolulu Rifles followed with arms reversed; then the philanthropic societies of Honolulu in due order, namely, the Excelsior Lodge and the Polynesia Encampment of I. G. O. F., Le Progres de l'Oceanie lodge of Masons, the Hawaiian Lodge of Masons, the Honolulu Royal Arch Chapter of the same fraternity, and the Mechanic's Benefit Union. Then came H.R.H. Kamehameha with his staff at the head of the Honolulu troops, whose arms were also reversed. The Royal Marines from the ship immediately preceded the coffin, which, surmounted by the hat and sword of the deceased, was borne on a field piece and drawn by thirty-six chosen men of the ship's company. The pall-bearers were eight in number, viz., the Commissioner of the United States, the Commissioner of H.I.M. the Governor of Oahu, the Captain and First Lieutenant of the *Alcibiade*, the King's Private Secretary, Lieutenant Reynolds, U.S.N., and Mr. John Montgomery.

The seamen and officers of the *Vixen* immediately followed the remains of their late commander; then the carriage of H.B.M. Commissioner and Consul General; his Majesty's carriage, the King's Ministers and Foreign Representatives, the seamen and officers of the *Alcibiade*, Foreign Consuls, personal friends of the deceased, British and other foreign residents, most on foot, but many on horseback and in carriages.

The line of the procession was absolutely thronged on both sides, and the police who attended were often needed to prevent obstructions. Arrived at the Cemetery in Nuuanu Valley, the funeral service was read by the Rev. S. C. Damon, the Seamen's Chaplain, and the body having been interred in the allotment of H.B M. Commissioner, the Marines fired three rounds of musketry over the grave. No melancholy occasion of a similar kind has been marked by such a general feeling of regret, and no funeral has been so imposing as a spectacle since that of the late King. Thus all ranks and classes of our community testified their respect for this early departed, this highly esteemed officer and gentleman.—*The Polynesian.*

The Chincha Islands.—*Peru.*

The Chincha Islands, situated ten miles from the coast of Peru, South America, in lat. 14° S., are three in number, known as the North, Middle, aud South Islands. The North Island has been most

extensively worked, and near two-thirds of its guano has been shipped to foreign countries. From the Middle Island about one-half the guano has been taken. The South Island is yet unworked, the working being prohibited by law.

These islands belong to the Peruvian Government; from them it derives a heavy revenue, and upon them, in the estimation of many, the existence or perpetuation of the government depends. With their burden of wealth, they have been the cause of most of the civil commotions which have convulsed Peru for the last fifteen years.

Much speculation has been indulged as to the cause of the deposits of manure. Some contend it is the product of a volcanic eruption (so frequent in that country), and was immediately thrown from the bottom of the sea in nearly its present condition. Others think it has been produced by sea-fowl, of which there are vast quantities on different portions of the coast. My opinion is it has been accumulated many centuries, and birds have produced a large portion of the compound. But that a portion has been formed from the decomposition of sea animals is equally certain, for at the present time their bodies may be seen on the South side of the South Island in different stages of decomposition, the product varying not in the least from the surrounding guano. These animals are principally sea-lions, and seal, some of larger growth,—three or four hundred pounds weight. There are many caverns in surrounding uninhabited islands where these congregate in numbers, and when intruded upon the echo of their roaring is terrifying to an inexperienced visitor.

The Chincha Islands, before the exportation of guano, were no doubt the resort of many of these animals, where they brought their meals of fish, leaving the relics to decompose and add to the pile of ages. It is a fact well known that when these animals sicken they invariably come out of water and strive to gain the summit of an island It is equally well known that flesh of all kinds, under certain chemical changes, produces the best sal ammoniac, and we find this the fertilizing base of guano. It is found in a pure state, mixed in the guano,—a white salt, known as the hartshorn,—its strength depending on its seclusion from the atmosphere. From these and similar facts, it may be considered certain that this rich deposit has been formed as I describe.

The depth of the guano on the North Island varies: its greatest depth is near eighty feet, and it averages about forty feet. It is quite compact, requiring the use of the pick to separate it from the mass. It is then easily broken to the required size, much pulverizing to dusty fineness. In its native state it is a dirty grey colour, but when reduced to powder assumes a reddish cast, similar to brick-dust. So susceptible of division are its particles, that much flies off in the atmosphere and is swept from the island by the wind, forming a lengthy cloud, which scents the air for several miles.

To prepare six to eight tons for shipment is considered a day's work for a labourer. The price given to labourers for working and delivering the guano at the "shoots," forty to sixty rods distant, is

three shillings per ton. The government contractor, Don Domingo Elias, has 4s. 6d. per ton, and sub-lets on lower terms, these parties selling contracts and letting to others. A few enterprising Americans have gained considerably by these operations, and others have failed to fulfil obligations.

The revolutionary movements of the country have rendered it difficult to obtain necessary workmen, and many have suffered from this cause. The greater portion of the working of the guano is performed by Chinese coolies, numbering on the two islands near six hundred, most of whom are on the North Island. These coolies live in a state of most deplorable degradation, far, far worse than the condition of the meanest slave who delves in the rice swamps of the South. They are almost naked, and are treated as brutes; not half provided for, and worked as brutes, subject to the lash of a heartless and domineering overseer. They do not profess ownership to these miserable beings, save in their work-houses. If one commits suicide (by no means uncommon) only so much labour is lost, and nothing in property. Thus one of the strongest motives which stimulates to good treatment of the recognized slave has no operation there.

The coolie trade has hitherto been carried on quite extensively in Peru, but the Peruvian Congress, prompted by humanity, has prohibited the further importation of these wretched creatures.—*Correspondence Milwaukee News.*

A Sandwich Island paper states that the whole amount of guano exported from the Chinchas in the month of February last was 21,315 tons register: of which 12,703 went to England; 5,912 to the United States; and 2,701 to France.

[A plan of the islands by Mr. J. G. Nathan, Master of H.M.S. *Alarm*, will be found, sheet 14 of the West coast of South America, No. 1,323.

In our volume for 1856 (April number, p. 181) will be found some further information on the subject of the treatment to which these unhappy labourers were *then* exposed. Whether that dreadful state has been rectified we cannot say, but according to the foregoing it would seem that things remain as they *were*.—Ed. *N. M.*]

Vancouver Island,—*British Colombia.*

Lochash House, by Dingwall, 11th September, 1858.

Strange indeed does it seem that the little stockaded inclosure, only a few feet square, so hidden in the depth of a pine forest that we required the aid of an Indian guide to find it, should now be attracting

the notice of the civilized world, and should bid fair to become the emporium of our trade, to restore our prestige in the North Pacific, and stranger yet is the revolution that has overtaken the whole of that coast from Vancouver Island to Panama.

Little more than ten years have passed away since returning from my first cruize up the straits of Juan da Fuca, I visited San Francisco, and ran down the whole coast, looking into nearly every port, bay, or anchorage between that place and Mazatlan in Mexico. At that time a few sea-worn whalers were wintering in San Francisco, and perhaps one or two others were fishing on the coast. Such were all the signs of life to be seen on this vast extent of coast, where the only language spoken was Spanish.

In 1848, gold was found in California, and then began the change which now has spread over this portion of the globe, so that the deserted solitary sea from Vancouver Island to Panama, became swarming with vessels. From one end to the other of the coast the English language prevails, and busy as it was in opening out extensive fertile provinces in California, it is no less so now in working corresponding miracles in British Colombia. It is of importance therefore that all the information should not be tinged with exaggerated pictures of the country and its capabilities. Esquimaux Harbour is evidently supposed to have more space and capacity than is to be found in it; but it has one or two of the advantageous features of the South face of the island.

The strait of Juan de Fuca is so called from the name of the Spanish pilot who, in his search for a passage round the North coast of America into the Atlantic first sailed into it, in the joyful conviction that the long sought opening was found. It is eleven or twelve miles broad, and continues in nearly at right angles to the coast E.S.E. for fifty miles, where some rocks jut out, called the Race Rocks, and the island trends to the N.E., and with the islands at present in question with the United States, forms the Northern boundary of a magnificent basin, about twenty miles broad.

At the very entrance of the strait lies Port San Juan, an inlet three and a half miles deep by one broad, where shelter may be found for small vessels. An important stream runs into the head of this harbour, which, though exposed to South and S.W. winds, is safe from all others. At forty miles beyond we come to the entrance of Sooke Inlet, one of the finest natural harbours in the world, and were it not for two rocks which stand at its entrance, would already have become the principal port in the island; as it is, steamers might now use it, there being room and water on each side of these rocks for vessels to pass. A winding channel of a mile and a half long, least water 4 fathoms, leads to the basin or harbour itself, than which nothing can be conceived more picturesque or better fitted for a steam harbour or depot. It is of an oblong shape, two miles by one, quite protected from the adjacent sea, and has a general depth of 10 to 12 fathoms, deep water (6 to 9 fathoms) alongside the rocky shore, which, in some places presents natural wharfs. The Western end has two circular

coves or basins, of most singular formation, with narrow entrances. Natural wet docks in fact they are; for from their complete protection any part of them might be used as a wet dock. A stream flows into one of these basins at its junction with the entrance channel, and there is good land in its neighbourhood. The general advantages which it possesses renders it second only to Esquimalt, although in some respects it is even superior. It would well repay the expense of removing the rocks at the entrance, and will doubtless soon attract attention.

A few miles farther to the Eastward are two bays divided by a point, with some rocky islets off it called the Race Islands. The Western "Becher Bay" is rather open and rocky, but still might be used for shelter in South-Westerly gales; the other, Pedder Inlet, is a long narrow arm with a stream running into its upper end, well sheltered from all but Easterly winds. Between this and Esquimalt lies Victoria Bay, itself a good anchorage, but exposed to Easterly winds, and eight miles from the Race Rocks, or fifty-eight from the entrance of the strait, the opening into Esquimalt Harbour breaks the coast line.

This harbour, though undoubtedly a fine and most convenient port, capable of great improvement by art, is not so extensive as its appearance would lead one to suppose. It consists of two arms, the longest of which continues North a mile and a half by half a mile broad, with a depth of from 8 to 3 fathoms just within the entrance. Constance Bay, the other arm, turns to the right, and continues nearly East three quarters of a mile, having a breadth of about a third of a mile, and a level bottom of from 6 to 7 fathoms, good holding ground and free from rocks.

This is the best part of Esquimalt Harbour, and is the place where the *Leviathan* should go to. From this description it will be seen that its extent is not so great as the requirements of such a trade will demand, as we may soon expect will more than employ all its space, and in a very few years call for the opening of the great Snooke Inlet and Basin, the head of which is not more than seven or eight miles from the head of Esquimalt Harbour.

The shores of Victoria Harbour are rocky, and the danger at the entrance is caused by a rocky patch, called "Brotchy Ledge." The route up to the old settlement, near which it appears the new town is situated, is very intricate, and although I believe it is quite true that no rivers of any magnitude have been found, there are abundance of small streams, which, in American hands, would soon be turned to account. Even before I left, the stream at the head of Esquimalt Harbour had a saw-mill and a grist-mill erected on it, and I could point out one or two considerable streams on the South face of the island which would soon repay the exertions of an enterprising man. With respect to the islands now in question as to which side the boundary shall pass, I have good reason for believing that when I was there the Western Channel was hardly known. The only avail-

able one being that used by Vancouver, was the Eastern one, which was doubtless that intended by the Treaty.

J. WOOD, *Commander, R.N.*

[In reference to the subject of the boundary line in the part of the world above alluded to, we perceive in a map recently published from a Government office, that *Point Roberts* is laid down NORTH of the 49th parallel, and that Smith Island, in our chart, is some five miles to the North of Vancouver's position for it. We cannot believe that the latter could have been so far wrong in latitude at a place on which he landed and observed; nor can we believe him to have been so far wrong as he is made to be in the abovenamed map, which has also *Mount Baker* far from where our chart *rightly* places it. Vancouver was not infallible; but considering his early time and his want of the refined instruments of these days, we consider him not unreasonably wrong in general, and we expect to find *Smith Island* restored to its position on our own chart, from which it has been altered, we believe, on American authority; and *Point Roberts* as well as *Mount Baker* placed in their positions on the abovementioned map, on the appearance of the very important survey making by Capt. Richards of H.M.S. *Plumper*.—ED.]

THE STADE DUES.

Whoever desires to know by what authority the King of Hanover levies a toll upon all vessels and merchandise passing the town of Stade, will be amply repaid by the perusal of the evidence given by Professor Wurm before the Stade Dues Committee. The Professor fills a chair of history in Hamburg, and is profoundly versed in the question of the Stade Toll, its nature and origin; and his attention has been much occupied with the more general question of the law as it respects the navigation of rivers.

We are told, then, on the authority of the ancient archives which have been industriously ransacked by the learned Professor, that Conrad, the second Emperor of Germany, did, in the year 1038, "as a remedy for the state of his soul," and at the intercession of his wife and son, grant to one Bezelinus, Archbishop of Hamburg, the right of levying market tolls or customs in a place called Stade, for the express purpose of providing funds for the rebuilding of the church and town of Hamburg, which had been burned a short time previously by the Normans and Sclavonians.

This right, such as it was, appears to have passed into the hands of the King of Sweden, with the Duchies of Bremen and Verden, at the close of the thirty years' war, and from the hands of Sweden again, in 1719, to King George I., Elector of Hanover, who was to possess

the Duchies "on the same footing as that on which they had been ceded to Sweden by the third article of the Treaty of Westphalia."

Such would seem to be the pretence—for it cannot by any stretch of courtesy be called a title—on which the King of Hanover claims the right of levying a most oppressive and injurious toll upon the commerce of the Elbe. How so flimsy a foundation for so serious an exaction could have existed for a hundred and thirty-nine years, and have imposed on the common sense of statesmen and politicians, is one of those things which it is extremely difficult to account for. In 1815 the principle of the toll was condemned by the almost unanimous voice of the Plenipotentiaries at Vienna, and the liberation of all European rivers declared to be one of the chief conditions of the settlement of Europe which was then effected.

Still the Hanoverian impost was retained, and not only retained, but increased from time to time until 1842, when certain reductions in the tariff were conceded; but even now it amounts to an average charge of £4 3s. 10d. on every 100 tons of British produce, and £4 13s. 2d. on every 100 tons of foreign produce, which ascends the Elbe. So confident was Hanover in her right, or in the immunity rather which attended its exercise, that she was deaf to all remonstrances and representations on the subject for many years after the principle of the toll had been condemned by the highest authority in Europe.

The stipulation in the 108th and 109th articles of the Treaty of Vienna respecting the navigation of all the tidal rivers of Germany was so plain that it could not be misunderstood. They were to be free "from their sources to their mouths." Hanover, pressed with these stipulations by the river-bordering states of the Elbe, attempted to get out of the difficulty by asserting that the impost was a maritime and not a river toll, and this audacious position she endeavoured to maintain before two distinct Conferences of the States of the Elbe, notwithstanding the determined protest of Denmark and of Hamburg, and the quiet sarcasm of the other States that they learned for the first time "that Stade was situated on the sea."

At length, in 1842, Hanover appeared disposed to give way, and then commenced the series of negociations which eventuated in the Treaty of 1844, so frequently referred to in these columns, but never without the expression of regret that any British Minister could have been unwise enough to commit this country to a recognition of the principle of the Stade Toll in any shape. Had Lord Aberdeen only adopted the policy indicated by his predecessor, in the remarkable note written immediately before he left office, we might long since have been rid of the nuisance of the Stade Toll. At all events we would have been in a far better position to negociate its abolition. The Treaty of 1844 electrified all Germany. "They thought it (says Professor Wurm) an impolitic Treaty for England. There was an immense difference between that Treaty and the note of Lord Palmerston, which had the greatest publicity in Germany. Nobody said it was authentic, but nobody denied it: and then, three years afterwards, England submitted to sign the Treaty, by which the Stade Dues are

acknowledged to all intents and purposes, only they are reduced in some articles, especially on English manufactures."

Nearly two months since we published the Report of the Stade Dues Committee, the most important recommendation of which is, as we pointed out at the time, that notice should be forthwith given to "terminate the Treaty of 1844 with Hanover." If this recommendation be adopted it will clear the way for direct negociations for the extinction of the toll. A contemporary condemns the projected capitalisation of the Stade Dues, because it would be an "ugly precedent to establish, that every country which, for whatever reason, imposes an import duty on British goods, should be entitled to claim compensation out of the Consolidated Fund for its reduction." If this argument is good for anything, it applies with as equal force to the Sound Dues, and the mode in which they were extinguished, as to the Stade Toll. Such reasoning would be sufficiently conclusive if we had not recognised the principle of the levy in the matter both of Denmark and of Hanover, and raised in the latter case no difficulty about it so long as the kingdom appertained to the British Crown. Here are the weak points in our case; and there is nothing for it, except we are prepared for a resort to force and try conclusions with Hanover, but to extinguish the Stade Toll on the principle of compensation. The effect of the abolition of the Sound Dues is already perceptible in the great increase in the Baltic Trade, and more particularly of the trade with Stettin. The abolition of the Elsefleth Toll on the Weser has perceptibly increased the trade with Bremen; and the rapid increase of our trade with the Elbe will unquestionably follow the abolition of the Stade Toll.—*Daily News.*

WINDS AND WEATHER OF THE PACIFIC OCEAN.

(Continued from vol. xxvi., page 272.)

Manila.—Observations made by M. Legentil on the climate of Manila, in the year 1767, are as follow:—

January.—North winds; weather fine, often cloudy, but little rain; ther., min. 64°, max. from 89° to 94°.

February.—N.E. winds; weather fine during the first part of the month, cloudy during the second part, no rain; ther., min. 61°, max. 94°.

March.—Wind begins to vary; weather fine, several storms towards the end of the month; ther. from 68° to 103°.

April.—On the 6th wind changes to South and is variable; fine mornings, lightning, several storms and many rainy days during the latter half of this month; heat considerable, ther., at sun-rise, from 76°, at the hottest part of the day, from 103° to 107°.

May.—Variable winds, often from East to South; thunder every evening and rain in torrents; ther., at sun-rise, 79° to 81°, at its max., 101° to 107°.

June.—In the first half of June the wind comes from all points of the compass; few storms, but much lightning. From the 14th to the 19th, E.S.E. and S.E. winds, accompanied by violent storms. During the rest of the month, wind variable, storms seldom, and rain; ther., at sun-rise, from 78° to 82°, at its max., from 99° to 105°,—once it was 108° on the 20th.

July.—During the first half of July East and S.E. winds, and sometimes N.E. The mornings fine, the evenings bad, and the nights magnificent. In general it rains more at Manila in the day than at night. Dnring the rest of the month West winds and no storms. From the 1st to the 15th, the minimum of the thermometer was from 80° to 82°, max. from 100° to 107°; from the 16th to the 31st, min. from 78° to 80°, max. from 100° to 103°. West winds always make the thermometer fall.

August.—During all August the wind varies very much, with storms whenever it is not at West. This month is the worst since the commencement of the year: storms, rain in torrents, and great variation in the temperature. From the 1st to the 20th, the minimum of the thermometer was from 80° to 82°, the max. from 97° to 103°. From the 21st to the 31st the max. is only 85° to 74°.

September.—Westerly winds, but variable; many storms, very little rain; ther., min. from 76° to 79°, max. 97°.

October.—Up to the 20th of October wind very variable and weather much warmer than indicated by the thermometer, which is not higher tha 99°, and generally is from 90° to 96°. Several gales of wind (especially one on the 23rd), accompanied with torrents of rain.

November.—N.E. winds; weather very fine, several cloudy days, but little rain; max. of the thermometer from 92° to 96°,—one day (the 25th) 98°, min. from 73° to 76°.

December.—N.E. winds, with bad weather, up to the 5th; variable from the 6th to the 17th; min. of the thermometer from 71° to 76°; max., the first five days, from 81° to 85°; from the 6th to the 17th, from 92° to 94°,—rainy days, from 83° to 84°; from the 18th to the 31st, from 89° to 92°.

The quantity of rain which falls at Manila is on an average 2·4 in., the max. 2·8 in., the min. 0·4 in.

Periodical Winds of New Guinea.—In alluding to the winds of New Guinea, especially those of the N.E. coast, it was observed that the S.E. trade winds only prevail there from June to October. During the rest of the year, on the N.E. coast, the wind varies from N.W. to N.E. In March, April, and May it is stormy and showery. From June to September there is constant rain on the S.W. coast of this island, and fine weather continues from October to March.

Between New Guinea and Java the monsoons change about six weeks after those of the China Sea.

Waygiou Island.—About this island the wind is generally found moderate from S.S.E. to S.W.

Winds on the East Coast of Australia.—On this coast, from Torres Strait to the tropic of Capricorn, from the end of April to September, the wind is from S.E. The N.W. monsoon blows in October and continues till April. It is also the period of rainy and bad weather; but the S.E. monsoon is the fine season.

Between the tropic of Capricorn and Bass Strait the S.E. wind prevails from October to April, bringing fine weather, with alternate land and sea breezes on the coast. There are, however, some exceptions to this rule, especially towards the South portion of the coast, where squalls from S.W. are met with and fresh winds, shifting from North to N.E., bringing rain, and sometimes thunder and lightning. These winds are generally of short duration. In summer a hot N.W. wind coming from the land is almost always followed by a squall, in which it shifts from S.E. to S.S.W. Vessels on the coast should be prepared for these squalls, which produce a considerable change of temperature. Flinders once found it go down from 101° to 65°.

Westerly winds, varying from N.W. to S.W., and more frequently the latter, begin in May and last till September. These westerly winds while they prevail are generally attended with fine weather, but when they shift to South or East bring rain. The reverse of this takes place during that period when the S.E. winds prevail, and they vary from N.E. to East.

Generally speaking, it may be said that in winter the weather continues unsettled with every wind from the sea, and even with a N.W. or northerly wind. Rain is frequent, although from these quarters it may only be light.

It may be further observed that in summer the land and sea breezes are more regular near the tropics than South of them, and that in winter in these latitudes the wind is more from S.E. than it is between the parallel of 30° N. lat. and Cape Howe. Sometimes also the S.E. monsoon is interrupted by northerly and southerly winds, but these only last a short time.

The following is a summary of the winds at Port Jackson for one year:—

January.—East winds prevail, sometimes light and interrupted by calms, causing storms as they shift to S.W.

February.—East winds, changing to N.E. and S.E., interrupted by N.W. and S.W. winds, veering westward, bringing heavy rains.

March.—S.E. winds prevail, interrupted by southerly winds with rain.

April.—Westerly winds prevail, veering to N.W. and S.W., sometimes blowing strong.

May.—Westerly winds prevail. Same weather as in the month of April.

June.—Westerly winds prevail, varying to S.S.W. and N.N.W., generally moderate, with fine weather.

July.—Same wind and weather as in June.

August.—Same as in the preceding month, with winds from South to East, bringing cloudy weather and rain.

September.—Winds from W.N.W. and W.S.W., interrupted by breezes from East.

October.—East winds, varying from N.E. to S.E.

November.—S.S.E. winds prevail, changing sometimes to South and S.S.W.

December.—E.N.E. and S.S.E. winds prevail, interrupted by winds from S.S.W. and South.

In respect of the changes of the barometer at Port Jackson, it has been observed that whenever the wind is either to the East or West of South the barometer rises, although the weather may continue bad. On the contrary, it falls when the wind is to the East or West of North even when the weather is fine. These observations have been made during June and July. The same has occurred in November and December, but in the unsettled weather of August the barometer rarely does this.

Winds of Bass Strait.—In Bass Strait the prevailing winds are from West and S.W. In summer, from January to March, N.E. winds are rather frequent and bring clear weather, but their duration is not to be expected.

The same winds and weather are found in Bass Strait as on the South coast of Australia, although in the East part of the strait they assume the character of those of the eastern coast of the continent. In this part of the strait the most violent squalls are from S.E.

In Bass Strait the gales generally begin at N.N.W. and go round to West and S.W., where they generally end. But if before becoming S.W. the wind backs from West to North, a continuance of bad weather is to be expected: otherwise, the barometer is a sure indication of the weather. It is rarely fine when the barometer stands at 29·9 or 30·0, and with the barometer at 20·7 m. bad weather is sure to follow.

Land Winds of Tasmania.—East of this strait, and on the East coast of Tasmania, we often meet with N.E. winds. They rarely blow strong. Squalls come most frequently from S.W. and S.E.,—chiefly from this latter direction, and great caution must be observed in approaching this coast between Capes Howe and Wilson.

On the coasts of Tasmania the prevailing winds are from W.N.W., varying to N.W. These latter are constant, especially from April to the middle of October. From the end of October to March the N.W. winds are interrupted by S.E. winds very frequently, and which sometimes in their turn prevail during this period.

During the year 1834 the wind blew from the following quarters in the following proportion:—

N.W.	93	S.E.	37
North	74	S.W.	29
South	55	West	27
East	37	N.E.	13

(To be continued.)

Destruction by Fire of the Ship "Eastern City."

Mr. J. Fowler, a cabin passenger on board the *Eastern City*, has furnished the following narrative of this unfortunate event:—

We sailed from Liverpool for Melbourne on the 10th of July, having on board 1,600 tons of general cargo, 180 passengers, and 47 officers and crew,—in all, 227. Notwithstanding a long continuance of contrary and baffling winds, we made a very successful passage to the equator, which we passed on the 11th of August; and we expected to arrive at Melbourne in seventy or seventy-five days from Liverpool, for our ship was a swift one, and in capital sailing trim. On the 21st of August the wind blew strong from the N.E. to the N.W. On the 22nd it increased to half a gale, with a heavy sea, the ship rolling about a good deal, and frequently going from twelve to fourteen knots an hour. On the 23rd the wind veered round to the S.W., but the sea still continued high; and at about 2h. p.m. the same day an alarm of fire was raised, and smoke was seen issuing from the forehatch.

Captain Johnstone, the chief-officer, and several of the crew and passengers endeavoured to reach the seat of the fire, which was supposed to be in the forehold, among the cargo; but in a few minutes the smoke became so dense and suffocating that we were driven up the hatchway. The passengers and crew were ordered on deck, and we then believed they had all obeyed the order; but it was afterwards discovered that one of the steerage passengers, named Peter M'Lean, belonging to the Isle of Skye, was missing, and he is supposed to have been suffocated in his berth. The forehatch was then closed, with the exception of holes of about two feet square, one on each side of the hatch, through which passengers and crew proceeded to pour vast quantities of water from the engine pump, and by drawing over the side from the sea. For some time the smoke did not appear to increase, and we confidently expected to be able to extinguish the fire; but after half an hour it was evident we were making no progress, and it was apparent our only chance was to endeavour to smother it. For this purpose the hatch was covered with blankets, shawls, plaids, and everything we could lay hands on, and the forecastle and forward parts with old sails.

Meanwhile the captain had hauled up the courses, and put the ship before the wind, and had got the boats provisioned and ready to lower away at a moment's notice. The women and children, about sixty in number, were removed to the poop, where the captain had placed numbers of old sails, carpets, &c., and did everything he could to make them as comfortable as possible under such terrible circumstances. All that long and dreadful night both passengers and crew continued to work without intermission, pouring tons of water down the hatches and forepart; holes were also cut in the deck, and engine-pumps and buckets went to work, pouring down water into the hold, the captain cheering us all the while, and never leaving the deck even for a moment. I could not but admire his calm courage, surrounded as he

was on the poop with so many weeping women and children, whom he never ceased to comfort by the assurance that they would soon be all safe in the boats.

The majority of the passengers were for a long time ignorant of the full extent of their real danger; but the more intelligent of us knew that we were more than six hundred miles from the nearest land, that our boats could not carry more than half of us, and that the sea was so high that no boat could be launched in safety, or if it got clear could not long live, deeply laden as it must necessarily be. Our only chance was of being picked up, but we were now far out of the route of all vessels, and we felt that our destruction was simply a question of hours. Still we worked without flinching; but towards morning it became evident that ere long our efforts would be in vain, for, from the smoke now finding its way into the first and second cabins, it become apparent that the fire was working its way aft among the cargo in the after-hold. The doors, windows, &c., of the second cabin were caulked up, and the seams of the bulkhead and doors of some of the state-rooms in the first cabin pasted over with newspapers.

The morning of the 24th broke upon us bright and beautiful, but still the sea ran high. We scudded before the wind, and still we worked hard with the energy of despair, for now all felt that there was but little hope for us. About noon the foreyard came down by the run, but without injuring any one. Many of the passengers and crew were now falling out from the engine and pumps, completely knocked up with the heat, smoke, and incessant work. During our short spells of breathing-time how eagerly we scanned the ocean! Several times I caught myself looking and fancying that I saw a sail, but it was only the sun lighting up the white crest of a wave. There was evidently no hope for us, and many of us became quite resigned to our terrible fate.

About noon the smoke and heat had become so great that we were driven from the topgallant forecastle, on which we had continued to pour water, and, indeed, were unable to remain forward of the foremast; the decks also became very hot, and we expected every moment to see the flames burst through the bows. We were also in some dread of the foremast giving way, which would have precipitated our fate, as in its fall it must have torn up part of the deck, through which the flames would then have burst upon us. The captain, purser, and myself, pitched over bottles containing papers detailing our position and gloomy prospects; and I, having been wounded in the thighs by a fall during the night, and feeling the little chance I would have in a scramble for the boats, had bid good bye to friends and to all the world.

The captain, chief-officer, purser, doctor, Mr. Warner, the other chief-cabin passenger, and myself, went into the saloon at 2h. p.m. to eat something, for we were all becoming faint. We were eating what we believed to be our last meal, but we were all calm and even cheerful, Captain Johnstone asking to be excused for the manner in which he was breaking up the preserved salmon, which, with a few biscuits,

was to form our dinner, and I for appearing at dinner in such a guise, being literally covered, hands and face, with tar.

At about 2h. 30m. p m., and when about to say "good-bye," in case of not meeting again before the final catastrophe, we were startled with the cry of "A sail!" I do not know how we all tumbled on deck, but we were there in an instant. How I looked to windward, and how faint and ill I felt when I at first failed to perceive anything but the ocean and a few black clouds just at the edge of the horizon;—how we all at last saw the sail, just like a distant gull—she was coming down upon us—close by the edge of the sun's rays on the sea; how we all cheered, and wept, and prayed, and laughed, and clasped each other's hands, and cheered again;—how great rough fellows hugged each other and wept like children;—how men who had probably never prayed before muttered sincere thanksgivings;—and how those who had preserved the greatest indifference when death seemed so near were now completely overcome,—I cannot describe. I shook hands with at least a hundred, many of them rough, illiterate men, but who had worked with a high courage in the hour of danger, and who were now as sincere in their feelings of thankfulness as the best of us.

In less than half an hour from the time we first sighted her, the vessel, which proved to be the *Merchantman*, of and from London, with troops for Calcutta, passed close under our stern. How we cheered her, and she returned our cheer as only British soldiers and sailors can cheer. Our captain hailed through his trumpet, "We are on fire, will you stand by us?" To which Captain Brown returned a hearty "Aye, aye, and send my boats to assist you."

Soon two of the *Merchantman's* boats and three of our own were launched; but the sea still ran high, and we expected every moment to see some of them swamped or dashed in pieces alongside; but, thanks to the ability and care of Mr. Punnell and Mr. Jones, the first and second officers of the *Merchantman*, and of our own officers in charge of the boats, they were conducted between the two vessels without a single accident. We first embarked the women and children, and by 8h. p.m. we were all safely on board the *Merchantman*, our captain being the last to leave.

When we consider the heavy sea running, and the way in which both ships rolled about, particularly the *Eastern City*, from the absence of sufficient sail to steady her, we cannot but admire the arrangements of Captains Johnstone and Brown; and to have rescued 226 persons from a disabled ship in such a sea, without a single accident, speaks for itself. On board the *Merchantman* Captain Brown had provided everything that he could devise for relieving our wants and conducing to our comfort, and well was he seconded by Captain Dawson, commanding the troops. They had prepared hot tea and biscuit for 400. The women and children were accommodated in the cuddy and officers' rooms, and the crew and passengers mustered and told off to mess with the soldiers and sailors, without the slightest confusion.

The *Merchantman* stood by the burning ship during the night, and

at about 2h. a.m., the flames burst forth over the topgallant forecastle. Soon after, the foremast went over the side, and in half an hour the main and mizen masts went, and soon after she was a mass of flames. We could see her still burning until about 5h. a.m., when, the *Merchantman* having stood for Table Bay, the distance became too great for us to distinguish other than a dark cloud resting against the dim horizon, which was the last we saw of our ship. We in the first cabin saved a portion of our luggage, but the whole of the other passengers and the majority of the crew lost everything. But we were all truly thankful for our preservation from a terrible and inevitable death; and we all feel that the finger of Providence was in it, for had the *Merchantman* not been obliged to put into Rio de Janeiro, in consequence of the illness of her medical officer then in charge of the troops, she could not have been so far out of her course, and in a position to rescue us.

A singular circumstance was reported to us by those on board the *Merchantman*. It appears that while at dinner, and immediately before they perceived us, the captain's lady and some of the officers affirmed that they heard distinctly, and at regular intervals, the sound of distant artillery. As we had no heavy guns, and did not fire off even a pistol, I am unable to account for the sound, which may have been caused by some submarine volcanic phenomena, or there may have been another vessel in distress at a greater distance, and the report of her guns may have been carried along by an eccentric current of air.

I, and I am sure every passenger on board, am anxious to bear testimony to the kind treatment we have received on board the *Merchantman*. Captain Brown went about amongst us like a father, and Captain Dawson also did all he could for us personally, and by urging his men to share everything with passengers and crew; and well did these brave fellows obey his orders. Mrs. Brown and Mrs. Dawson were very attentive to the women and children. Lieutenants J. R. Carlisle and J. B. Ruttledge; Ensigns D. W. B. Ogilvy, P. W. Howley, and Smith; as also Gentleman-Cadet R. H. Inglis, H.E.I.C.S., and Assistant-Surgeon Forrest, R.N., nobly emulated each other in striving who could be kindest to us, and best minister to us in our all but destitute condition. When we learned that British officers were on board we felt assured that by them we would be treated with the sympathy to which in some measure our misfortunes entitled us; but we were quite unprepared for the generous kindness, displayed in such a feeling and considerate manner, which we have experienced during our voyage on board the *Merchantman*.

I cannot speak too highly of Captain Johnstone's conduct, and I am sure every one who was on board the unfortunate *Eastern City* will agree with me. He did all for our safety and the safety of his ship that man could do, and by his calm courage animated us all; while by the ability of his arrangements everything was conducted in an orderly and systematic manner, at a time when the slightest confusion must have been attended with the most disastrous consequences.

As the fire originated in the forehold, with which there was no communication from the forecastle and foresteerage, and as the forehatch had been battened down for four days, it must have been caused by spontaneous combustion, or the friction of badly stowed packages, during the previous day, when the ship rolled so heavily in the high sea.

I cannot close my communication without bearing testimony to the calm behaviour of the female passengers. After the first half hour they never complained, and it was only when the ship took a more than usually heavy roll that some of the more timid uttered a few screams. Poor things, they were many of them resigned to their sad fate! The purser's wife, in particular, astonished me by her calmness throughout. The ship, cargo, and property belonging to the passengers cannot have been worth less than £90,000 to £100,000.

On the passengers landing at Table Bay they presented letters to Captain Dawson and Captain Brown, expressing their gratitude to them for their noble conduct in rescuing them from a terrible death, and for their subsequent kind and generous treatment. The Government emigration agent took charge of them, and the barque *Caroline Elizabeth* had been chartered to take them on to Melbourne. A subscription had been started at Cape Town to relieve their temporary wants.

Chinese Pirates.

The *London Gazette* has recently published a series of despatches from Admiral Seymour, containing the particulars of three expeditions against pirates, all of which were successful.

The Admiral states that the first was under the orders of Lieut. L. Wildman, commanding H.M. steam gunboat *Staunch*, who attacked three pirate vessels on his passage from Shanghai to Hong Kong, and destroyed two of them, with most of their crews. Taking into consideration the great disparity of force opposed to the *Staunch*, and that the latter had only her two 24-pounders howitzers on board, this gallant action reflects great credit on Lieut. Wildman, his officers, and limited complement.

Lieut. Wildman reports:—"I went ahead at full speed on to the largest junk, giving orders to lash her alongside us; but the instant we touched, such a shower of stinkpots and other combustible matter was thrown on board us, it was impossible for any person to remain forward, or to see through the dense smoke they occasioned. It was at this moment, I deeply regret to state, that Edward George, A.B., who was actually engaged in lashing the junk alongside, having gallantly jumped on board her for that purpose, was cut to pieces, and his remains thrown overboard. The strong breeze favouring the junk

and a heavy swell making it difficult to lash her, she sheered off; and the Chinese, in the meantime, having cut our boats adrift, and being close to the rocks, I backed astern, and having picked them up, I remounted the howitzers, which had been dismounted from the rapidity of my fire, and renewed the engagement, running alongside one and boarding, killing a great number of her crew, many of whom endeavoured to escape by jumping overboard, but only a small number reached the shore.

"Leaving this vessel in charge of Mr. Morice, the second master, and a party of men, I gave chase to a second in my gig, and having come up with her, I boarded and took possession, making prisoners of the only two living men on board, many having been killed, and a few escaping by jumping overboard. The third junk in the meanwhile having gone some distance away, and not having more than five effective men left after the engagement, I deemed it prudent not to follow her among the numerous rocks and intricate passages she had taken, and being unable to spare any officers and men for the captured junks, I gave directions for them to be burnt, which was done."

The second expedition was under Commander Cresswell, who described as follows:—

"When within about 1700 yards, they opened fire on me, which I did not return until within about 1000, when we engaged them with one port broadside, firing shot and shell.

"I then directed the *Cambrian's* boom boats to take up a position in shore of us, so as to be able to advance, taking them in flank as their guns came within rage. The enemy directed much of their fire to the boats, which was admirably replied to by Lieut. J. W. Webb, as he steadily advanced with his boats.

"The enemy opened on us at 8h. a.m., keeping up a smart and well directed fire with round shot and spear-headed rockets, and, as we closed, with grape and canister, hulling the ship on several occasions, and had we not kept on a continual move would doubtless have caused us material damage.

"After about thirty-five minutes their fire considerably slackened, and about nine o'clock two of their largest lorchas blew up with a tremendous explosion, caused apparently by the bursting of one of our shells; they appeared immediately paralyzed, and their firing ceased. Taking advantage of this, I pushed on with my own boats, and, joining with the *Cambrian's* boats, effected a landing within a very short distance of the junks, having observed the crews desert their vessels and take to the hills.

"On advancing to the top of a neighbouring ridge some more piratical vessels were discovered in a snug creek in the opposite side, crowded with men, and evidently prepared for an attack from seaward. Our position completely commanded them, and by opening fire upon them with our rifles, killing a great number, caused the others to run away, after a vain attempt to reach us with their gingalls, our height being too great for any effective fire from the large guns.

"Not deeming it prudent to expose the men unnecessarily to the scorching heat of the sun, I ordered their return to the boats in preference to advancing by land, and, returning myself to the *Surprise*, closed, and, taking the boats in tow, steamed round abreast the creek, and fired a few shells. I then despatched the *Cambrian's* and our own boats, under cover of our fire, to effect the capture of the junks. No resistance was offered, beyond the occasional fire of gingalls from the neighbouring hills, the junks being deserted.

"Several of them being aground, and many others much shattered from our fire, we only succeeded in bringing out seven, so I ordered the remainder to be destroyed by fire.

"On boarding and landing to effect this, we found a number of dead Chinamen, and observed for the first time several guns mounted on shore, commanding the creek, that were destroyed.

"The capture of the piratical fleet being completed, nineteen having been set fire to, and seven taken possession of, and observing the total destruction of those fired by the explosion of their several magazines, I proceeded on my return to Hong Kong, taking four of the junks in tow, the three others being in charge of officers with orders to follow, and arrived at this port at 9.30 p.m. with the four junks, the others arriving during the night."

The third expedition was conducted by Capt. Vansittart and issued in the destruction of no less than 100 piratical vessels, and 236 guns sunk in deep water, with heavy loss to those desperate miscreants. The town of Coolan, the head-quarters of the pirates, was also destroyed, as well as a stockaded fort of fourteen guns.

The Treaty with Japan.

The islands of which that empire is composed include, it is said, a population of nearly double that of the British Islands, while it has many towns nearly as populous as London, Paris, and Liverpool. But the proximity of these islands to China, the Corean peninsula, and Tartary, make their harbours the more valuable to us as rendezvous and trade-resorts for British shipping. The Treaty gives us the right to appoint a resident Diplomatic Agent at Yedo, the capital. The ports and towns of Hakodadi, in the principality of Matsmai, straits of Saugor, on the island of Jesso-Kanagawa, on the West coast of Niphon, about lat. 36° 5′ N., and Nagasaki, on the S.W. extremity of the island of Kiussiu, are to be opened to British trade on the 1st of July next. Nee-e-gata, on the N.W. coast of Niphon, lat. 38° 1′, or, if that be unsuitable as a harbour, some other port on the West coast of that island, is to be opened in January, 1860; and another port, named Hiogo, (which we do not find laid down in the

charts,) in January, 1863. Consular Agents are to reside at these ports.

The Dutch, who have hitherto had almost a monopoly of the rich Eastern trade, will, no doubt, find it much interfered with hereafter by the Russians, Americans, and British, under the recent treaties. In order to secure the exclusive monopoly of the Japanese trade to their factory on the small island of Dezima, in the harbour of Nagasaki, it has been their uniform policy hitherto to frustrate all attempts of other nations to open intercourse with the country. The harbour of Nagasaki is about three miles long and one broad. It extends North and South, and has a muddy bottom, where ships lie in five or six fathoms. There is a plan published of it.

In this Treaty Lord Elgin has secured for us much greater privileges than were conceded to the Americans four or five years ago. Commodore Perry then only obtained by treaty for the United States the right to trade at two ports, Hakodadi and Simoda, in the gulf of Idzu, with a coaling port at the South. We have, on the contrary, access to the important trading port of Nagasaki, where the Dutch factory is situate, admission to the capital, and the right of trade with other important commercial ports on the Western coast. Nagasaki is but a convenient run from Ningpo and Chusan, and is nearly in about the same latitude as Nankin.

The privilege given to British subjects to lease ground, purchase land, erect buildings, and permanently reside in the ports named, is an important concession. But after January, 1862, they may also reside in the capital, and from January, 1863, in Osaca, for the purposes of trade. Osaca is the third city of the empire, and the commercial metropolis of the most fertile and populous portion of these islands. It has a spacious and secure harbour, and the city is built at the mouth of the Yedægawa, the only navigable river in the empire. This city was much damaged by an earthquake in 1854.

On the romantic inner life of this singular and secluded nation, of which fresh details, exemplifying their high state of civilization, harmony, and many social improvements, have recently been laid before us, we need not comment. These, however, suffice to show that we have been fortunate in opening up trading communications with them, and, if conducted on the usual footing of British mercantile operations, we shall certainly gain on the good opinion of the people, and hereafter further extend our privileges. The general regulations laid down for trade are even more favourable than those of the late Chinese Treaty, as there are many new and important clauses which will work well for mercantile interests. Our Diplomatic Agent and our Consul-General may travel over any part of Japan: but British merchants, and residents generally, are limited at present to a radius of a few miles round the city or port where they are located. We are at liberty, however, to employ Japanese for any lawful purpose.

The import and export of specie is permitted, and foreign coin is to pass current in payments in Japan. Supplies for our men-of-war are

to be stored free of duty at the principal open ports. British subjects may import and export any lawful merchandise on paying the prescribed duties, which are fixed at a moderate rate, chiefly about five per cent. Intoxicating liquors are subject to an import duty of 35 per cent., opium is prohibited, and munitions of war are only to be sold to the Government. The articles for the regulation of trade appear to be simple and efficient. A fine of 1,000 dollars, and the confiscation of the goods, is to be the penalty for smuggling. The ordinary Custom-house entries on import or export are to be made. The usual privileges are accorded to men-of-war, mail steamers, vessels in distress, and whale ships touching for supplies. The Custom-house fees, in lieu of tonnage dues, are very moderate, being £3 for an entry, about 30s. for a clearance, while other documents, such as bills of health, permits, &c.. are 6s. 6d. (a dollar and a half). It is much to be regretted that—looking at the difficulty of the navigation and the intricacy of many of the straits and harbours—we have not had better surveys or charts of many of these eastern islands. The greater part of the South-western extremity of Niphon and part of Kiussiu are yet undefined, while good plans of some of the harbours and ports opened up are wanting. We trust, therefore, the Government will turn their early attention to this subject, especially to the completion of Mr. Richards' surveys made in 1855.

Mitchell's Maritime Register.

REPORT OF THE METEOROLOGICAL DEPARTMENT OF THE BOARD OF TRADE,—*Presented to Parliament in May*, 1857.

Look at it which way we will, the subject of meteorology comes home to us all. Many a mortal assignation has it checked, many a good and a bad intention has it frustrated, and many another has it encouraged and crowned with its smiles. If it thus affects ourselves, as we know it does, whose movements are on *terra firma*, how much more must it concern those

> "Whose ways are on the mountain wave,
> Whose home is on the deep."

or, in other terms, (what is designated by some) the treacherous element! and whose very business it is therefore to read its daily lessons in the skies,—to construe readily and timely the signs which it exhibits, and shape those ways accordingly. It has long been a neglected science, and, considering how closely it concerns the seaman, it was full time to set him to work, that he might teach himself by his own hands how to become weatherwise.

Impressed with the urgency, not to say the convenience, of this

quality in the seaman, the author of these lines, long ago impelled by the desire of being useful, devised a scheme and commenced for himself an investigation of these things, on the same principle as that commenced about the same time by Maury. Many a leisure moment from pressing duties is turned to good account, but this undertaking was nipped in the bud; and what was followed as an amusement, from mere inclination and principle, within the domestic circle, at length belongs to the business of an office! Thus we read in the first report of Admiral Fitz Roy, which previously alluding to Mr. Marsden, when Secretary of the Admiralty, having suggested a plan similar in principle for the same kind of investigation (rather a satisfactory coincidence of ideas as to the mode of conducting it), says,—"4.—In 1831 a systematic commencement of a collection and discussion of meteorological observations made at sea was undertaken at the Hydrographical Office of the Admiralty [rather say at the private residence of an officer of that office] upon a similar principle; but pressure of other duties, and the limited extent of means applicable, impeded a continuance of the collection, which was scarcely more than commenced."

"5.—The twelve large volumes (one for each month) prepared for the Indian Ocean, as being less known than the Atlantic, [and containing that commencement], are now in this office, with their corresponding charts, subdivided into squares."

"6.—This useful arrangement, dividing the ocean into squares, which affords the means of grouping and averaging observations, as well as identifying spaces of sea, like provinces of land, was thus originated at the Admiralty." And, we may add (this last being the work of our own hands), was not considered worthy of being followed up! But Maury* worked on in much the same way, and after many years of such investigation has produced *his* store of ocean treasures, sought for now by every seaman who knows their value, and his excellent example has won him imperishable honour. But so it is, in sea meteorology as well as in deep-sea sounding,—we have permitted another country to take the lead of us! We who have enriched all the chart depots of Europe and America with the best materials they possess of distant coasts of the world, constructed from expensive expeditions, one after another, left the *coup de grace*, the finish of the work of years, to be given by another hand. "Es forzoso a veces hablar de si mismo," say the Spaniards. We will now, then, turn and follow the Admiral who is busy in those investigations which, more than a quarter of a century ago, were considered here to be not worth taking up. Would that the late Captain Basil Hall had been at the helm to direct such matters in those days. That officer, who said (and it was perhaps from him that we imbibed the principle) that

* We congratulate Lieut. Maury on having received from the Archduke Ferdinand of Austria the great gold medal for art and science awarded to him by his Imperial Apostolic Majesty the Emperor of Austria.

"it is one of the chief points of a seaman's duty to *know where to find a fair wind*, and where to fall in with a favourable current," would have set the example, instead of being obliged to follow it, of establishing an office for such investigations.

We find the Admiral laying down in his first report a series of progressive statements relating to the collection and discussion of these observations, a course of proceeding which forms the substance of that report. In this he points to Maury's success, to the late Colonel Reid's investigation of the law of storms, the Brussels conference, the views of the Royal Society, the instruments, charts, and books supplied for use with the aid of the grant from Parliament, the wind charts reduced from Maury's, the *weather book* established for ships, the objects to be attained by it, the great advantage of quick passages (now so well known), the propriety of recording observations in every sea as well as every land, the improvement of the barometer, and the importance of correct observations, the supply of data books on sixteen subjects, amount of logs received, merchant ships (180) supplied with instruments and charts, the reference to good observers in the *Mercantile Navy List*, the wear and tear incurred, the delay arising from war, the Admiralty stores of information (abundant indeed they are), the weak force to discuss all these things, the observations discussed by Colonel James, the Kew barometer and its great advantage, his own establishment, the publication of his results obtained, simultaneous observations, and what is doing by other Governments. Such are the principal topics of the report, recorded as in themselves subjects for future discussion.

For our own part we attribute much, very much, importance to a discussion which would elicit the limits of that district of the sea that is occupied by any particular wind: for by knowing this the seaman can realize the doctrine of Basil Hall. What, for instance, are the limits, North, South, and West, of the late Easterly gale? By knowing this, the seaman homeward bound from abroad would know where his advantage lay in approaching these islands. But so many views are opened out of different kinds, even in this single question, that the discussion assumes at once a voluminous character.

In the appendix to this first report, we find the important letter of the Royal Society above alluded to, explanatory forms and examples of entries of the desired information, the merchant ships supplied, instructions for filling forms, and various other kinds of information on the foregoing subjects. We find all this matter forming the first report before us: a consideration of the contents of the three numbers published since it was presented to the House of Commons we shall take up in our next volume.

Nautical Notices.

Particulars of Lights Recently Established.

(Continued from p. 555.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
63. Billingsgate Island	East side, 41°52·4′ N. 70° 3·9′ W.	Cape Cod Bay, U.S.	F.	40	12	Est. 1st Sept., '58. Former discontinued.
Bishop and Clerk Shoal	41° 34·3′ N., 70°15·3′W.	Nantucket Sound U.S.	R.	59	14	Est. 1st Oct., '58. Interval 30 seconds. A fog bell also established.
64. Sandy Point	Not given. Between Greenbury Point and Magothy R.	Chesapeake Bay, U.S.	Ffl.	50	12	Est. 1st Oct., '58. A fixed light at 12 miles; beyond it a flash every minute and a half.
Five Fathom Bank	East of Cape May	Delaware Bay, U.S.	Lt.	Vessel.		Est. 1st Oct., '58. S.E.½S. 2½ miles from shoalest part of bank. In lieu of former.
Fire Island Inlet	40° 37·9′ N., 73°12·9′W.	Long Island, U.S.	R.	166	22	Est. 1st Nov., '58. Interval flash once a minute. N.E. about 70 yards from old tower.
65. Cape Grosso	38° 3·5′ N., 12° 21·4′ E.	Isl. Levanzo, Sicily	F.	282	18	Est. 1st Oct., '58.
Messina	Not given. Fort Campana	Entrance of port	F.	..	2	Est. 1st Oct., '58.
Port Syracuse	37° 3′ N., 15° 17′ E.	North side of entrance	F.	86	10	Est. 1st Oct., '58. A red light, in lieu of former.
66. Cape Howe	Gabo Island, middle, 5½ miles S.W. of cape	Australia. Screened from S.b.E.½E. to S.½W.	F.	..	17	Est. —. Temporary. A stone tower preparing on S.E. point of island.
Cape Otway	.....	S.W. point of cape	R.	..	24	Est. —. Once a minute gives a flash.
Cape Willoughby	Kangaroo Is. S.W. extr.	Australia	R.	..	24	Est. —. Seen all round the horizon between bearings of S.b.E.½E. to N.E.½E.
67. Port Phillip	Gellibrand Point	Ditto	F.	..	..	Appears red when seen between the bearings of N.E. to N.W.
	Sandridge Jetty end	Ditto	F.	..	3	Est. —. Red.
	Sandridge Railway Pier	Ditto	F.	..	3	Est. —. Green.
	Williams Tn. end of old Jetty	Ditto	F.	..	3	Est. —. Red.
68. Valetta Harb.	N.W. angle of Fort Ricasoli	Malta	F.	55 80	4	Est. 1st Nov., '58. Two vertical red lights. Seen between the bearings of W.¼S. and, round southward, N.b.E.⅝E. When S.½E. they will clear the buoy off St. Elmo, and kept in sight will clear St. Angelo and Langlea Points.
69. Lepso Reef	Light-vessel	changed in position	F.	..	..	Est. 1st Oct., '58. Light-vessel moved 3 cables to N.E.b.E.¼E. of former.
Holevarde Harbour	Extr. Point, 59°19·5′N., 5° 19·9′ E.	Norway	F.	..	..	Est. 6th Oct., '58. In lieu of former, discontinued 1st May, '58.
70. Port Ciotat	Mole Head	France	F.	52	6	Est. 15th Oct., '58. *Red.* On entering the port keep the red light to port, and that on Berouard Mole to starboard
Port de Isola Ronssa	Pier head	Corsica	F.	..	3	Est. 15th Oct., '58.

Lights continued.

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
71. Out-Skerries	Easternmost rock of Gruna	Shetland	R.	145	17	Est. 1st Dec., '58. Instead of the present temporary light.
72. Cape Borda	Kangaroo Is. 35° 45·5′ S., 136° 34·3′ E.	Australia	R.	..	30	Est. 13th July, '58. Interval half a minute, a red and white light alternately. Visible bearing between N.E.b.E.½ E. (by North and West) to S.W.b.S.
73. Augusta Port	Eastern Coast	Sicily	R.	90	14	Est. 1st Nov., '58. Instead of the present fixed light.
Trieste	S. Teresa Mole	.....	R.	..	13	Est. 4th Oct., '58. Interval 30 seconds. Light continues 8 seconds.
74. Barnegat	39° 45·8′ N. 74° 6·1′ W.	New Jersey, U.S.	R.	165	22	Est. 1st Jan., '59. Interval 10 seconds. Instead of present fixed light.
Amelia Islnd.	North side of Island	Florida	F.	60	..	Est. 1st Nov., '58. Beacon lights.
Mississipi	Pass à l'outre Middle Ground	United States	F. F.	35 ..	..	Est. 1st Jan., '59. In lieu of present flashing light.
75. Rondo	62° 25′ N., 5° 35·2′ E.	Norway	F.	161	22	Est. 18th Oct., '58. In lieu of present. Between 16th May and 1st Aug. not lighted.
76. Handkerchief Shoal	Vinegar Sound	Texas	..	..	..	
77. Matagorda Bay	Alligator Head	United States	F.	38	..	Est. 15th Aug., '58. To show upper entrance of Swash Channel.

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

Taking Ramsgate Harbour in Bad Weather.

Complaints have reached us that certain boatmen, imagining themselves pilots for Ramsgate, have, accordingly, taken charge of vessels for that harbour, and not being aware that the gale does not always blow *home*, by running under reduced sail have nearly lost their vessels. We are, therefore, requested to circulate the following *caution* on the subject. Query, do these would-be pilots belong to the Deal boatmen of whom so much was said lately from having lost their occupation of picking up vessels on the Goodwin Sands? But here is the Notice and the Caution.

Notice.—To pilots, boatmen, and others, in charge of vessels making for Ramsgate Harbour in stress of weather. When close to the Red buoy of the fairway, keep the vessel under as great a press of canvas as circumstances will permit, and steer for the lighthouse pier; and observe a leading mark, namely, a white diamond on a black ground, upon the landing platform and inner face of the East pier. Keep this leading mark full in view until fairly in, and the harbour will be entered with facility and safety.

By order, T. M. Shadwell, *Secretary.*

Caution.—Several vessels, in charge of boatmen (as pilots,) having narrowly escaped destruction during the recent gales by running for the harbour of Ramsgate under insufficient sail to give them proper steerage way, and by keeping them too far from the White and Red buoys of the fairway, and thus crossing the stream of tide, instead of coming to the entrance before it,—such persons are hereby cautioned, that they hazard, by their ignorance or misconduct, life as well as property, and are acting in direct opposition to the printed and published Sailing Directions.

K. B MARTIN, *Harbour Master.*

NEW CHARTS.

KANGAROO ISLAND, Sheet I., is the title of a chart forming a portion of a four-sheet chart of that island that has just reached us from the Trinity House at Adelaide, through their talented Surveyor, B. Douglas, Esq., Naval Officer and Surveyor at that port. It is a business like production, more remarkable for the fidelity and amount of the information which it affords than for *finished* chart drawing. But it is what is wanted; for although the generality of seamen would like a bolder style, so as not to require their spectacles, by such a style one half of the information we now obtain would be lost. Mr. Douglas has evidently accuracy at heart, and as he knows how to secure it, we say to him "persevere." The sheet before us includes the N.E. quarter of the island, with Backstairs Passage, all the dangers of which (on the scale of two miles of latitude to the inch) are sufficiently clear for the use of any seaman. Mr. Douglas deserves (and we hope he will receive) every possible encouragement in pursuing his excellent and useful labours.

CHART OF THE NORTH ATLANTIC OCEAN,—*with the Winds, Currents, and other Phenomena. By A. G. Findlay, Esq., F.R.G.S., &c.* Laurie.

Mr. Findlay has long been known to us as an accurate and pains taking compiler, both of which qualities are well exemplified in the four-sheet chart before us. Maury has done us all good. After all, he has shown us how important is that knowledge which we did not posses before he produced it—how the wind blows in the different parts of the ocean and at different times of the year, and many more things besides, which have swelled the number of his pages to their present inconvenient quantity. But although Maury is a methodizing man, we would rather not have to use his wind charts. What we should have preferred would have been a resultant chart—the end and object of all his labours. Now a very fair approach to such a document has been made by Mr. Findlay, who has managed, by a very simple and intelligible system of symbols, to convey Maury's information on this chart in a manner that enables the seaman to see his track on the chart and his place at noon. Thus, winds and currents are clearly and intelligibly expressed everywhere, and for all times of the year. Nor are blank spaces of land to which all charts are more or less liable, left unregarded. These are occupied; one with the same chart on a minor scale, that shows on the same principle the amount of rain, and what is better (for what does the seaman care for rain in comparison with wind) he gives the limits of the *trades*, and *variables*, at different seasons

of the year. For this we give you much credit, Mr. Findlay, and every seaman, who uses your chart, will thank you for it.

In another compartment we have the mean velocity and direction of currents, no less acceptable to the seaman; in which very neat little compilation, the results of our own bottle chart have been introduced, and the mean distance which the surface water travels in ten days, is observable by a curvilinear series of dots, leaving conspicuously the limits of the *Sargasso Sea*, and making the more or less extended progress of the surface waters easily readable.

We have always considered symbols as intended expressly for charts. They form a language which will be easily learned by *habit*, and when learned will be found to be comprehensive and expressive,—in fact, conveying *multum in parvo*, a quality which recommends itself especially for charts, where the seaman not only wants all the information which they convey, but also all the space sufficient to see his whereabouts, and his way before him.

The good taste of Mr. Findlay is also observable in the chart before us by his substituting figures for those curved lines with which some charts are defaced for the mere purpose of showing the *magnetic variation*. That method is all very well for the philosopher's reasoning portfolio, and there it should remain. For are not the simple figures, neatly written, just as good for the seaman? In our opinion they are far better; for *they* do not disfigure the chart as the so called magnetic curves most wofully do. On the whole, we congratulate Mr. Findlay on having produced an elegant chart, and we commend it to the attention of seamen.

TIDE TABLES—*for the English and Irish Ports, for* 1859. Admiralty.

The appearance of the Admiralty Tide Tables for the ensuing year of 1859, claims from us on many accounts a sketch of this important annual. The gradual increase of its matter from about 20 to nearly 200 pages, since its commencement, by order of the Lords Commissioners of the Admiralty in 1833, is a tolerable proof of that importance. In 1833, the first of its appearance, times and heights of high water for every day of the year were predicted for *four* ports only, viz., Plymouth, Portsmouth, Sheerness, and London. In 1835, another port was added, and in the following year we find the list had increased to eleven ports; from which date to the present time the publication has progressively enlarged, and now numbers twenty-four ports of actual tidal prediction, showing the times and heights of high water morning and afternoon at those places for each day throughout the year. These consist of the principal ports on the coasts of Great Britain and Ireland, including that of Brest for the benefit of our yacht clubs and other vessels navigating the North coast of France and the adjacent sea.

Following these Tables appears an important feature in the shape of a convenient method of deducing, from them, the height of the tide at any intermediate hour, between high and low water, at any of these places.

It is the opinion of many, even nautical men, who have not carefully considered the subject, that if at any two ports, A and B, the time of high water at A be given daily; the difference of the times of high water at full and change at those ports would, if applied to A, show the time of high water on that day at B. This would be correct reasoning if the curves of the semi-monthly inequality of the times were similar; but such a coincidence seldom, if ever, occurs: for although at full and change such a correction would apply, yet, between full and change and the quadratures, unless those curves in the semi lunation were identical, the results would be greatly in error. To show, how-

ever, when a correction may be used, so as not to produce any great error, at page 103 a list of Tidal Constants is given, the application of which to places specified will give the time and height of high water at certain other ports sufficiently accurate for practical purposes.

Next follows a description of the general set of the tides in the neighbourhood of several ports of our coasts, including a full account of the streams which rush between the Orkneys, and through the Pentland Frith, by Lieut. F. W. L. Thomas, R.N. And then comes the important developement, by the late Rear-Admiral F. W. Beechey, of the movement of the great tide-wave up the English and Irish Channels, and into the North Sea.

Lastly, as an appropriate addenda to such tables generally, the time of high water on the days of full and change at many places throughout the different shores of the whole world are given, arranged both according to the apparent progress of the tide-wave, and also alphabetically, along with the range of the tide at springs and neaps.

Thus in 1833, when this pamphlet contained only 20 pages of information, it now appears with 191 pages, occupied with these matters, 97 of which are devoted to the prêdictions for twenty-four principal places.

So large an increase both of matter and manner of employing it, bespeaks a corresponding amount of application in its production, imparting a mass of information of a highly useful kind, and of that general nature unequalled in any other Government Office of the whole world.

The computation and whole management of the tables is the work of Mr. John Burdwood, Master, R.N.

Sayings and Doings.

It is said that the *Great Eastern* (*Leviathan*), in the hands of a new company, will be completed by the approaching summer, and ready to make her first experimental trip by May or June next.

Among the passengers by the *Golden Age*, just arrived, is Lieut. Burke, U.S.N., who has been ordered to this city for the purpose of fitting out and commanding an Exploring Expedition to the North Pacific. We understand he has been instructed to give his attention to the interesting question of "deep-sea soundings,"—he, it is said, being the inventor of the only *known* apparatus answering for that purpose.—*S. F. Bulletin.*

Some idea of the extent of the trade and travel created by the Fraser River mania, may be gathered from the fact that in the *Alta California* of July 14th, besides the six large steamships running to Puget Sound, there were advertised, six clipper ships, (including one of 2,200 tons,) three barques, five brigs, and seven schooners,—in all twenty-seven vessels on the berth.

The railroad from Alexandria to Suez is expected to be completed by the 1st of December, when all the difficulties and *désagrémens* of "crossing the Desert" will be avoided, and the route to India, China, and Australia rendered as complete and comfortable as travelling by sea and land can be made.

Details have been received by telegraph from Marseilles of the taking of Turan. The gunboats destroyed five forts in half an hour. The allied troops

occupied the town, and have thrown out reconnoiting parties into the peninsula. Turan has been declared French territory. The expedition will advance to attack the metropolis at the end of September.

His Royal Highness the Prince Consort, accompanied by his Royal Highness Prince Alfred, arrived at the Clarence Yard, Gosport, a few minutes after twelve o'clock on Wednesday, from London Their Royal Highnesses were received by Admiral Sir George Seymour, Captains Denman, Seymour, and Hastings, and other officers attached to the garrison. On embarking on board the *Fairy*, royal yacht, a salute of 21 guns was fired from the *Victory*, and from the Garrison Battery and the Dutch squadron at Spithead. The *Euryalus* fired a royal salute as the *Fairy* approached, and the crew manned yards and cheered enthusiastically as the Royal Cadet and his august father went on board. The *Euryalus* immediately got under way, and proceeded on her voyage to the coast of Spain, being accompanied to the Warner Light by the Prince Consort in the *Fairy*. The royal yacht then returned to the harbour about two o'clock, and was saluted on approaching the harbour. The Prince of Wales, attended by Major Lindsay, went down to see Prince Alfred off. The parting between the two brothers was very affectionate, and the Royal Cadet seemed also much moved at parting with his old friends and instructors, Dr. Minter of the Royal Yacht, and the Rev. W. R. Jolly of the *Illustrious*. The young Prince will mess with the Midshipmen of the *Euryalus*, in accordance with a desire which he originally expressed.

The Conservators of the River Thames have visited the eastern limits of the Thames Conservancy and limits of the port of London. The jurisdiction of the conservancy extends to the eastward as far as a line drawn from Yantlet Creek, on the Kent shore, to Crow Stone, near Southend, on the Essex shore, and the port of London extends eastward as far as a line from near the North Foreland, on the Kentish shore, to the Naze of Harwich, on the Essex shore. The ancient boundary stone, near Yantlet Creek, was found completely embedded in sand and shells. The Crow Stone, on the Essex side, having been, comparatively, recently placed there, is a prominent object, and is discernible at a considerable distance. It is the intention of the conservators, we understand, to place a new stone on the site of the ancient stone at Yantlet. The conservators who attended the inspection were—Jonathan Thorpe, Esq., J. Turnlen, Esq., J. Dakin, Esq., Rear-Admiral Austen, C.B., Comdre Shepherd, R.N., and Capt. Figott of the Trinity House, accompanied by Capt. Burstall, R.N., secretary to the conservators.

Passengers who left Honolulu May 1st, in the *Yankee*, arrived in New York June 12th,—43 days through, which we believe is the quickest time ever made from Honolulu to New York.

The Spanish expedition against the Riff pirates is reported to be about to sail under the command of General Prim.

The coasts of these islands, especially to the northward and eastward, were visited on the 7th and 8th by severe gales. The amount of casualties is, we regret to say, large.

LONDON:

WALTER SPIERS, PRINTER, GREAT PRESCOT STREET.

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