THE

NAUTICAL MAGAZINE.

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NAUTICAL MAGAZINE

AND

Naval Chronicle

FOR 1859.

A JOURNAL OF PAPERS

ON SUBJECTS CONNECTED WITH

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Naval Chronicle.

JANUARY, 1859.

JOURNAL OF H.M.S. "INFLEXIBLE" ON A VISIT TO FORMOSA, *in Search of Shipwrecked Seamen.—By Commander G. A. C. Brooker, R.N.*

We left Hong Kong on the 3rd of June, and arrived at Amoy on the 5th. On the 6th, in company with Mr. Morrison, the Consul, had an interview with the Toutai and Admiral, explaining to them the object of our visit to Formosa, and requesting their assistance in our humane expedition. They said they could do nothing in the matter, as Formosa was quite independent of their authority: all they could do would be to forward my letter to the Toutai of Taiwan. Even this much would be an assistance, as it would show that official that our proceedings were known and were of a peaceful nature. However, next morning they sent Mr. Morrison word that they could not forward my letter without first applying to the authorities at Foo-chow, under whose jurisdiction Formosa lies. From this I can see that my mode of proceedings must be quite independent of the Mandarins, who will evidently not assist, probably from political purposes.

I ordered some three or four hundred proclamations to be printed, offering rewards for any Europeans who may be found, or any clue which would lead to their recovery. These proclamations I intend distributing as we coast along. I was in hopes of gaining more information at Amoy than that which is contained in the enclosures for my guidance, which is of a vague and indefinite nature.

At Amoy I found that the excitement which had been caused by some faint rumours having arisen about foreigners being still in Formosa, had quite subsided, and no one seemed to take any interest in the matter. The only man who had shown such a lively interest was Mr. Tait, but he had gone to England, and no one in his office could give us any further information than what is contained in Mr. Tait's despatches on the subject. With respect to the ring which is mentioned in Sir J. A. Douglas's letter to Viscount Palmerston, I heard it has turned out quite a mistake: a ring was seen or was sold which had a crest on it very similar to that of Mr. Smith; a dagger or naked sword was wanting on the ring spoken of to make it agree with that of Mr. Smith. I examined Wee-ke-sin, one of the people sent over to Formosa by Mr. Tait; but whether from smoking opium or from old age, he had very little recollection of what he saw and heard when he was sent over to make inquiries about missing foreigners. His statements to me partly corroborated his former one. His memory seemed now so impaired, that I did not put much reliance on his vacillating account.

Monday 7th.—Having received an interpreter and a messenger, the latter being one who had been sent to the northern part of Formosa in 1857 in search of Europeans by Mr. Tait, but without success, we left Amoy, steaming for the Pescadores Islands, through which we passed the next day forenoon, and after passing East Island, steered for Kok-si-kon, off which we anchored at 4h. p.m., a mile and a half. This place is very difficult to make unless the weather is particularly fine, as there is no guide or mark except a few detached huts, which appear to be in the water from the very low beach on which they are constructed. The soundings are the best guide, and Ape Hill when it can be seen. Seeing a fisherman, I got him on board, who pointed out Kok-si-kon. I heard at Amoy that the entrance to the port had become blocked up, which I found confirmed, for on sending a boat the next day to gain intelligence, a landing could not be effected; a heavy surf was breaking right across the entrance. I could not proceed any further owing to constant rain and thick mist, and as the wind was North-easterly, we lay comparatively safe.

10th.—The wind being direct off shore and not very strong, I pulled in in the gig, and landed on the low sandy beach near a few miserable huts, which constitute Kok-si-kon. I should think there were not more than forty men who inhabit these hovels, wretchedly clad and seemingly half starved. These fishermen do not permanently live in these huts, but remain during the fishing season, and then return to their villages inland, some fifteen miles, with which they keep up a daily communication. I gave them some proclamations of rewards relative to missing Europeans, and they said they would distribute them to the different towns and villages they were in the habit of trading with. These fishermen had never heard of any shipwrecks on the coast.

Since Mr. Richards, Master of H.M.S. *Saracen*, surveyed this

place it has become blocked up from the inner basin, which, forming a bank outside the entrance, causes a heavy surf to pass. I found a passage in with only five feet where was formerly two and a half to three fathoms. The trading junks now use another passage, about four and a half miles further South. We continued South, and anchored off the land near Fort Zelandia.

11th.—As the weather seemed settled, and the ship could be left with safety, the wind still remaining Northerly, I took the gig and cutter, armed, under charge of Acting Lieut. Stokes, and pulled in towards the shore, along which a surf was breaking. I obtained the assistance of a fisherman from one of the many catamarans that were near us fishing. He very willingly offered to show us the way for a small present. We pulled in under his direction, and got safely inside by going through a narrow passage formed by two distinct lines of breakers. This passage is only used by small fishing boats in fine weather. We continued on, passing the old Dutch fort of Zelandia, now a heap of ruins, and got into a narrow canal which leads to the city of Tai-wan, the chief city of the island. The channel was very intricate and tedious, being in some places nearly blocked up by rafts, which were coming down laden with the produce of the interior. This mode of conveying merchandise seems the only one in use. At length we arrived at the suburban village of the city, from which I despatched the messenger with a letter to the Toutai, stating that I would call on him at noon (it was then 10.50). Accordingly at that time I went to the Yamun, with a small guard, accompanied by a few officers.

We were received by the Toutai Prefect and Commodore with every outward feeling of goodwill. He quite understood the object of our visit, and promised to do all in his power in recovering any shipwrecked foreigners that may be still on the island. His opinion was that if Europeans were in any part of the island under Chinese authority, he must have heard of it, as strict injunctions had always been issued respecting shipwrecked foreigners being sent to Amoy or Foo-chow. He considered that if foreigners have fallen into the hands of the aborigines, or, as he styles them, "raw savages," of the island, it was next to an impossibility that any escaped with their lives. From what he had heard of these wild people, he believed them capable of cannibalism. I do not put much faith in this part of the Toutai's statement, having heard a different version of these "raw savages," of whom I hope to give a short account before we have finished our search.

I left about one hundred proclamations with the Toutai, who said they should instantly be forwarded to all the magistrates of the different districts of the island which were in the possession of Chinese, with instructions to those officers to have them distributed to the small towns and villages under their respective orders. These proclamations are more intended for any future wreck that may occur, although they refer to missing Europeans for years past; and I especially pointed out to the Toutai a handsome reward would be given if

even a clue could be obtained that would lead to clearing up the mystery that has been so long existing of those now missing. The Toutai assured me all that could be done should at once be set about; but he thought there was not the slightest chance of anything coming to light. I told him it was probable I should pay him another visit within a month, when I should see if he had received any reports. I gave him to understand a man-of-war would be on the coast for an indefinite period, or until we had gained some certain knowledge of the fate of these unfortunate people: this would urge him to carry out his promises to assist. He was quite as ignorant as we were of the Eastern side of the island, inhabited by the aborigines, a savage race, between whom and the Chinese, who live on the West side, a deadly feud exists. He strongly advised me not to attempt visiting the Eastern side; but the advice was probably given not wishing us to know anything of the island. We then took our leave; but could not get out of the canal before 10h. p.m., the tide having left the boats dry on the mud.

Taiwan is a large city, much cleaner than any which I have seen in the North or South of China. The streets are moderately broad, and well paved with square tiles. It is not so densely populated as the generality of Chinese towns. They import many things from Amoy in exchange for rice and sugar, which seem to be the principal produce of the island. We found provisions exceedingly high in price, which I was told arose from the failure of the rice crops last year. The difficulty of access to this fine city, which can only be reached by the canal we went up, would be a great obstacle to commercial enterprise. The only means of conveying merchandise is by rafts, which we saw going down the narrow canal; and the constant surf on the beach is another obstacle.

12th.—Weighed and steamed down to Takow, (Ape Hill,) keeping about three or four miles off shore. At Takow I communicated with a Mr. Rooney, who has a receiving ship inside the small harbour, and carries on a trade with some Chinese who live a few miles inland. I left with him some proclamations, which would be sent to these people. He had often questioned the Chinese with whom he traded if they had ever heard of Europeans being kept in slavery on the island, but they could give no information. From Mr. Rooney I obtained a guide for two places further South.

14th.—Anchored at 7h. a.m. off the village of Pong-li, about a mile and a half off shore. A heavy surf was breaking on the beach, preventing our boats landing; but having obtained a catamaran, I landed with a small armed party, and after a walk of five miles through a rich and highly cultivated country, our guide brought us to the residence of Bancheong or Mancheong, a Chinaman, from whom I expected to gain some information respecting the missing Europeans. But he could give no more than what I had previously heard. I questioned him very closely, and offered large sums for any clue. But he most unhesitatingly stated that all he knew of any foreigners was, that about seven or eight years ago, it might be nine,

he was not certain, a ship was wrecked at or near Lung-kiow, and that the crew were murdered by the aborigines, except three, who were rescued from these savages by some Chinese, who treated them very kindly, and they eventually got back to China. He also said, a steamer came over shortly after the wreck and rewarded the Chinese who had acted so kindly to the shipwrecked people. This statement agrees with one made by a Chinaman who was sent to Formosa by the American Consul at Amoy, in 1851, to make inquiries respecting missing Europeans, whose report I saw in the records of the British Consulate at Amoy. With respect to the articles mentioned in this report, Mancheong denies ever seeing or hearing of them, nor did he see the Chinaman who made the report. This Mancheong has upwards of five thousand men under his control, whom he employs tilling the land, of which he possesses a large extent in the neighbourhood of the hills where he resides, consequently he commands great influence with the people, and at times sets the authority of the Mandarins at defiance, and presents so formidable an appearance that the latter have more than once retired from an attack they have made on Mancheong for the purpose of extorting money from him. Mancheong is in the habit of trading with some of the aborigines through some of his people; and he assures me, from what he knew of their fierce, savage disposition and thirst for blood, no European's life would be spared if one fell into their hands. He says, they are more savage in some parts of the island than in others, especially in the South. I left several proclamations with Mancheong, who would have them conveyed and explained to the savages, whose language is quite distinct to the Chinese, and totally different in sound. I heard there were many Chinese settled among these wild inhabitants of the woods, and had great influence with them, because they were the means of procuring articles from the Chinese which the aborigines themselves could not obtain.

We continued this day to the Southward, and anchored in the bay of Lang Kiow for the night, intending to visit the village in the morning. I may here mention that this bay forms an excellent anchorage in the N.E. monsoon, being well protected from the N.E. by the high land, which approaches within three miles of the beach. There is a good holding ground in 7 fathoms of water within two miles of the shore, and it is an open bay with no dangers on either side. It requires no directions for entering, but merely to steer in mid-channel, and being guarded by soundings. Ships caught in a N.E. gale and near this place would be glad to run there for shelter. A small chart of the bay will accompany the general charts. From Pongli South the coast gradually rises to high hills, at the back of which are still higher ones where the aborigines live.

15th.—After some difficulty, owing to the surf on the beach, we landed and communicated with the villagers, who could only give the same information of foreigners as Mancheong did. I saw an old woman who had received some money from a steamer that came to Lang Kiow seven or eight years ago, for kindness which she had shown to

the Europeans spoken of by Mancheong. These villagers, live in dread of aborigines, who were in the habit of descending from these mountains, tearing up the dead for the purpose of extorting ransom from the living relatives. Not being able to gain any more information, and a strong wind blowing in from Southward, rendering our anchorage unsafe, we tripped and stood out to sea. The barometer was falling, and every appearance of the weather indicating a storm. We ran down to the South cape of the island and hauled up on the East side, where it was more moderate; but heavy rains obliged us to keep well off shore. Towards evening the weather became fine; barometer went up, and wind veered to the N.E. Stood in, and steamed along the coast until dark, within a mile of the shore. No sign of a habitation could be seen. When we stood off for the night, we could see lights about one third way up the mountains, which are too densely wooded to allow of seeing any huts by day.

17th.—Steaming slowly up the coast, within one mile of the shore, no soundings with one hundred fathoms. Seeing some people on the beach where the mountains receded a little, I pulled in in the gig with the interpreter, intending to communicate with the aborigines; but a heavy surf which was breaking on the beach, prevented our landing. It was here I had an opportunity of seeing these wild tribes, and the statements I heard from the Toutai of Taiwan and Mancheong were not exaggerated, except that part of the Toutai's when he said he believed they eat people. On the beach were about ten or twelve aborigines and twenty to thirty Chinese; I could not describe the frantic and wild manner in which these savages rushed along the beach, eager to attack us if we landed. The way in which they poised their long shining spears convinced me they throw them with an unerring aim. Their other weapon was a bowie-like knife, fastened to the waist with a sash of linen, the only article of dress on them. Their long straight dark hair flying loosely over their shoulders, added to their ferocious appearance. It was only the heavy surf that prevented them from rushing out to us: more than once they made the attempt. They then prepared a boat, made like a Chinese sampan, but well adapted to go through the surf, and would have launched it, but were prevented by the Chinese, who, strange to say, have settled among these savages. I hailed the Chinese to let them come out in spite of their bloodthirsty intentions, as we were well prepared. But as my object was to conciliate, if possible, these people, we did not show any firearm above the gunwale of the boat. I offered them money and presents, and got the Chinese to explain to them that our object was of a peaceful nature; but they would hear of nothing, and threatened to murder the Chinese if we did not go away. On seeing our carbines, the aborigines became less furious, and as they would not let the Chinese come out to us, a shot was fired over their heads, which had the desired effect of making them retire a hundred yards to the rear, near a few miserable looking huts. The Chinese then launched the boat and willingly came out to us. From these I learnt the neighbouring mountains were inhabited by

upwards of four thousand of these tribes. The Chinese here did not exceed three hundred, who, I suspect, were formerly convicts, as I heard from them they had been sent over a few years back by the Mandarins. They said, it required the greatest precaution on their part to get on at all peaceably with the aborigines. Their mode of living was as wild as their appearance,—potatoes, which they cultivate in a few patches up the hills, and any animals they could kill, were their only means of subsistence. These Chinese had lived with the aborigines upwards of eight years and they had never heard of foreigners being detained on the island. Had seen vessels pass, but none ever came so near as we were (three quarters of a mile). I gave them some proclamations, which they took on shore and explained to the savages, who burst out in great fury, waving their long knives for us to go away. As I could gain no object in landing, even if the surf admitted of it, and the Chinese having willingly come out to us to prevent our attempting to land, which they said would be at the sacrifice of their lives, we came away.

Having now seen these savages and the determined manner they would have attacked us even under the fire of the ship, I cannot think that any foreigners, if wrecked on the East side, could escape from the clutches of these barbarians. And it is highly dangerous for a sailing ship to approach too near the East side, for if becalmed she must inevitably go on shore. The swell from the Pacific would set her directly in, and no anchorage could be obtained, for at fifty yards from the beach we could not get soundings with twenty-five fathoms, and some little distance further North with one hundred fathoms within a quarter of a mile from the shore. The mountains rise as it were abruptly out of the sea, some to the height of 8,000 feet, densely wooded.

We continued up the coast, keeping close in shore, examining every little bay that appeared in sight, but no habitation of any sort was seen, or any people. Outside of Soo-au Bay we saw several fishing boats, manned by Chinamen, by one of whom I was told there was a good anchorage in the bay. And having heard from various quarters of sulphur mines being in the neighbourhood of Soo-au, we anchored at the entrance of the bay in 13 fathoms. It was too dark to proceed in any further with safety.

The next morning's daylight showed this place to afford a good and safe anchorage, in both monsoons, for fifteen to twenty vessels of large tonnage. Indeed I consider it the only good harbour Formosa possesses. A correct survey was made of it by the able Assistant Surveyor who was lent from the *Actæon*, assisted by Mr. Clements, the Master of this vessel. It is easy of access, and may be boldly entered without fear, the water gradually shoaling to five fathoms within two cables of the shore. In the centre of the bay is a group of rocks, all above water, with three fathoms close to. They should not be approached within one hundred yards. A good anchorage lies between them and Soo-au Village at the head of the bay, where good fresh water can readily be procured from a rivulet which runs through

that village. There are also two other good anchorages in the bay, off the Villages Pak-hong-o and Sam-hong-o. Coming from the Northward the bay can be easily found by sighting a steep island, from which the Soo-au Rocks bear S.b.W. thirteen miles. Ships should not pass between Soo-au Rocks and the North Cape of the bay, as the reef of sunken rocks appear to extend nearly out to them. The place offers no opening for commerce; rice is the only article grown (in large quantities) except a little tobacco, which the Chinese consume themselves. Only two junks were in the harbour, which had come over from Chin-chew for rice. Provisions were very dear, as at the other places we have visited.

Having visited Soo-au, the Kalewan River, and Kee Lung, I then deemed it advisable to find out the sulphur mines and explore them, as so much has been said about Europeans being held in slavery there. It would at least clear up that part of the mystery attending the fate of foreigners. At Soo-au no sulphur mines exist, the only one is that which we visited.

During our stay at Ki-lung a careful survey was made of that harbour. I consider Soo-au by far the best in point of safety and is easier of access. The coals which we obtained at Ki-lung are good for keeping steam, but the enormous expenditure is the great objection to their use. I directed the chief engineer to test them with Welsh coal, his report I beg to enclose.

A piratical fleet of twelve junks had left Ki-lung eight days before we arrived, taking with them five large merchant junks laden with rice and sugar. I could not find out in what direction they had gone. We anchored off Tamsui, but did not attempt to go in with the ship. It would be dangerous for any vessel drawing more than 12 feet of water. It was blowing fresh, and a heavy surf was breaking over the bar. Coals cannot be procured at Tamsui. I was told small quantities of a very inferior nature were obtained at some distant place up the river: I could not obtain a specimen. We continued down the West coast of the island as close as the lowness of the land would admit. We could discover no harbours nor the appearance of any. There are a few small rivers, all of which are barred, used by small trading junks.

At Taiwan I again communicated with the Mandarins, who reported they had heard nothing, although strict orders had been sent to the magistrates of the different districts to institute inquiries respecting missing Europeans.

Having now made the complete circuit of the island, instituting as strict a search as I possibly could, without success or gaining even a clue, however slight, this proves that either there are no Europeans on the island, or, if there are, that they are secreted away amongst the aborigines, which I can scarcely believe, for I think they are too bloodthirsty and savage a race to spare the life of a white man five minutes after one fell into their hands.

I must confess that I left the shores of Formosa with reluctance, as I entertained on starting on this highly interesting expedition

hopes, however faint, of obtaining something definite of these unfortunate people.

Enlarged surveys of Ki-lung and Soo-au will be made by Mr. Blackney, the Assistant Surveyor, on his rejoining the *Actæon;* and here I cannot omit to notice the indefatigable exertions of this scientific young officer, who evinced the utmost zeal in the performance of his surveying duties. I beg also to mention the name of Mr. J. P. C. Clements, Master, who was of great assistance in making the surveys I allude to as well as the notices of the coast.

Accompanying this despatch are the enclosures which I received for my guidance before leaving Hong Kong.

Translation of a Report by Urian, who was sent to Formosa by the United States Consul at Amoy, to search for missing Europeans.

I sailed from Amoy on the 12th day of the 7th moon (August 8th, 1851), and arrived off the mouth of the Tung-keang, near Pongli, on the evening of the 15th day, where we anchored. At midnight a typhoon commenced with unusual severity, and on the following morning, in company with three other junks, we were wholly wrecked, with great loss of life, and all our lading and luggage.

After having been exposed to peril for about twelve hours, I providentially escaped on a small raft, and reached the shore, saving nothing but the clothes that were on me. My effects consisted of thirty Spanish dollars, value of fifteen dollars in medicine, and seven to ten dollars in personal clothing. The medicines having been procured for the ostensible purpose of trafficking in them, so as to avert suspicion from the real object of my coming.

I remained one day at the village of Tang Keang, to get a suit of clothes made; and whilst there was waited on by a military officer, who informed me that he had orders to arrest any foreigner, or any Chinese subject employed by foreigners, who might land on that shore; showing me at the same time his warrant therefore, and saying that he was fully aware I was of the latter class thus interdicted. He dismissed me, however, with a caution to be careful as to the nature of my communications with the inhabitants. From Tung Keang I went to Lung Seavu, the residence of Bancheong, a person of much wealth and influence, and the principal agent in effecting the rescue of a portion of the *Larpent's* crew. Deeming it important to confer with him on the subject, previous to adopting any definite plan of research, at an interview which I had with him he spoke of the improbability that any foreigners were then in captivity in the South part of the island, since the liberal reward which had been lately given by the British Government for the manumission of such was widely known, and would surely have brought them to light for the sake of further reward; besides which, he declared he was intimately acquainted with the whole region of the South, including its interior, and if such captives were there he could scarcely fail of knowing the

fact. He further informed me that the suspicions of the Mandarins of Tung-shan district had been awakened by the recent visit of H.B.M. steamer *Salamander*, and that they had sent police officers to apprehend the persons concerned in liberating the *Larpent's* men; also that he himself had been summoned to appear at Tai-wan-foo to answer for his part in the matter, which, however, he refused to do. The other individuals spoken of had succeeded in bribing the police, and were thus allowed to escape.

I had heard that Bancheong was the owner of a watch, spyglass, and sextant, and on inquiring the manner in which he possessed himself of these articles, he replied, they were brought to him by some aborigines about four years ago for sale; that he neither knew their use nor their value, only that they were foreign instruments. He exchanged some goods for them, and while in his possession they were seen by a Mandarin, who taking a fancy for them, Bancheong begged him to accept of them, which he did. Just about the time that these instruments were brought to him for sale, an European vessel was wrecked on the very spot where the *Larpent* was lost, and he supposes that if any of its men escaped to the shore, they were murdered by the same people who killed the larger part of the crew of that ill-fated barque, the locality being considered as highly dangerous to the safety of even a Chinese traveller.

It was against the remonstrances of Bancheong that I proceeded more than a day's journey South-easterly to the point where these catastrophes had occurred, hoping to learn facts there in relation to these and other wrecks, in which, however, I was not successful. Two or three days before, in the typhoon of which I have spoken, three junks were wrecked at this fearful spot, and three persons from their crews were murdered,—the headless body of one of whom I saw lying on the beach.

All these massacres of shipwrecked seamen are committed by a small but ferocious clan of aborigines, supposed to number about sixty or seventy persons only, who inhabit a woody mountain bluff, at the foot of which wrecks are frequent, and the total destruction of life and property almost certain. These savages are said by the Chinese, and by the native tribes, to have a passion for acquiring human heads, which was thought by my informers to be more their object than the possession of booty.

Hence I travelled in a course N.N.E. as I judged about 200 le (say sixty-five miles), visiting the Chinese villages of Lae Chong and Luiluk, situated just at the base of the mountain range, held by the aborigines, at the distance of seventy le, or thereabouts, from the West coast. In this interior region I spent three days, diligently prosecuting my inquiries, but could learn nothing further than that three or four years ago a foreign vessel was wrecked on the East shore; of the fate of the crew and property they could tell me nothing—(this item of information I obtained from the aborigines through an interpreter).

From this place I went two and a half days' journey, and reached Puu-heang village, on the West coast, sixty le North of Tai-wan-foo. No intelligence could be gathered here, except that two European vessels were lost on the Pescadores on the 29th Tam-kwang.

At Puu-heang, lying on the same coast, forty le still further North, this statement was confirmed, and having learnt that a certain individual, resident at this place, but now absent at the said islands, could give the fullest information concerning wrecks, I took passage thither and landed at Nea-kem, the principal island, sought him out and found him. This man stated, in the 29th Taou-kwang, 3rd moon, (24th March to 22nd April, 1849,) near an island called Kil-pe, lying but a short distance from Na-kem, the top of the mast of an European vessel was discovered standing out of the water. Also, that on the 28th day of the 7th moon of the same year, (13th September, 1849,) a vessel, the cargo of which consisted principally of teas, was wrecked in the same place; *(Sarah Trotman?)*—that the crew of this vessel got off in two boats, one of which was driven to the West, so that nothing further was known of it; whilst the other succeeded in making Ma-kem, whence they were sent by the Mandarins to Amoy in a Chinese vessel.

From this island I embarked for Tai-wan-foo, where I in vain sought for additional facts of the matter. After one day I sailed for Amoy, and arrived here on the 9th day of the present moon (September 4th, 1851).

Report of the quality of Ki-lung coal tried on board H.M.S. Inflexible, June 22nd, 1858, in a boat's galley.

Quality of Coal.	Weight of Coals in Pounds.	Weight of Water in Pounds.	Time taken to evaporat. Water.	Remarks.
			h. m.	
Kilung.....	20	20	1 15	A great quantity of smoke; Consumption very rapid.
Ditto	20	30	1 45	Ditto. Ditto.
½ Kilung, ½ Welsh ..	20	35	2 34	Not so much smoke but more flame.
14lb Welsh 7lb Kilung	21	30	2 0	Not much smoke, but a little flame.
14lb Kilung 7lb Welsh	21	30	1 50	A great quantity of smoke, no flame.
Welsh	20	30	2 47	Very little smoke, the combustion slow.

Quality of coals under steam. Engines working on the second grade of expansion.

Quality of Coals.	No. of Boilers used.	Pressure of Steam.	Amount of Ashes per hour.	Amount of Clinkr per hour.	Amount of Coals per hour.
		lbs.	lbs.	lbs.	lbs.
Welsh	2	12	200	100	1400
Kilung.....	2	12	80	40	3360
⅓ Welsh ⅔ Kilung	2	12	112	80	2800
⅓ Kilung ⅓ Welsh	2	12	120	90	2464

From the 26th to the 28th of June, 1858, the coals received at Ki-lung, in the island of Formosa, were burnt on board this ship. They were found to keep steam without any difficulty, the engines working on the second grade of expansion, the two after boilers being used. There was a great quantity of light coloured smoke, very little ashes, and scarcely any clinker. The consumption per diem is thirty-six tons, or more than double that of the Welsh coal (the consumption of the Welsh per diem is fifteen tons). In a mixture of the coals in the proportion of one third Welsh to two thirds of Ki-lung, the consumption per diem was six tons less. With equal parts of Welsh and Ki-lung the saving in the consumption per diem was 9 tons 12 cwts, It is my opinion that a mixture of Ki-lung and Welsh coal would be advantageous to steam vessels not making a longer passage than three or four days, particularly for the gunboats;—the steam could be got up more quickly, and with the hanging bridges the soot and scoria would be rapidly taken to the foremast end of the tubes. In the tubes of H.M.S. *Inflexible* I find that the soot collects only at the fire-box end, the funnel being placed over the furnaces, and the tubes being return tubes. Whereas in the gunboats, the funnel is over the foremost end of the boiler, so by using a nozzle of the largest size on the exhaust pipe in the funnel, the steam would escape with much more velocity and much less resistance to the engines.

JAMES CONNER, *Acting Chief Engineer.*

WINDS AND WEATHER OF THE PACIFIC OCEAN.

(Continued from vol. xxvii., page 671.)

New Zealand.

The following, abridged from the valuable paper by Captain Byron Drury, R.N., of H.M.S. *Pandora*, published by the Meteorological Department of the Board of Trade, gives an account of the winds and weather of New Zealand.

It is a matter of interest to trace the extent of the almost rotatory storm, the N.E. wind, which commences at East, and frequently, after suddenly changing from N.E. to N.W. and S.W., ends within a few

points of where it commenced. This is more observable at sea than in the vicinity of the land; where it is an expanded rotary gale, and therefore has not the dire effects of a hurricane. Its prognostics are so certain, and commence so gradually, that the anticipated changes can be made subservient to effecting a passage.

This N.E. gale appears to be common to the southern regions from Bass Strait eastward to Tierra del Fuego. Descriptions of it at the latter place do not materially differ from what is observed here, except that here they are more decided in the spring and summer than in the winter.

Before discussing the local winds of these islands, we may describe the ordinary winds off the coast, extending to Australia and Van Diemen Land, beyond those latitudes where periodical monsoons exist.

The barometer is a certain indicator of changes in these latitudes; no vessel should be without it; but it requires study, for the greater height presages N.E. gales, and its changes require special notice in reference to the weather. In the latitude of Auckland we have known it to range from 30·66 to 28·80 during the revolution of a gale, which began at N.E.

The ordinary wind of these seas is westerly nearly the whole year round.

It may be generally assumed that the barometer falls to North and N.W. winds; that these are the rainy quarters; and that although the wind becomes stronger at first as it draws to S.W., the weather will clear up.

The steadiest wind is about W.S.W.* The changes are almost invariably with the sun, or contrary to the movements of the hands of a watch.* South winds bring cold clear weather; and raise the barometer high. S.E. winds are uncommon, but when they do set in, usually in April, May, and June, they last several days; with cold raw weather; and the barometer about 30·00. The N.E. wind occurs about once a month in spring and summer, but less regularly in winter; it is preceded by cloudless serenity and calms; the barometer from 30·30 to 30 60. A light breeze from the eastward, drawing to N.E., is gradually accompanied by a dull sky; the barometer begins to fall and the breeze freshens briskly. The sky becomes overcast, and usually in twelve hours it begins to rain. From that time to thirty-six or forty-eight hours the wind continually increases: in a heavy squall it will suddenly shift to the N.W., from which quarter it blows still stronger for from six to eighteen hours, latterly accompanied by heavy rain or hail; lightning is frequently seen in the S.E. quarter. The barometer is at its lowest a little before there is another (sometimes) sudden change to the S.W., from which quarter it begins to clear, while the glass rises rapidly, although the squalls are at first very violent. The wind sometimes remains in this quarter,

* Contrary to those of the northern hemisphere, though still with the sun, which of course is there viewed differently.

sometimes veers round as far as S.S.E.; but if it should remain at W.S.W., fresh steady breezes and fine weather will last for several days. We have traced the diameter of one of these rotary gales to 960 miles.* They seldom last more than three days, before the weather becomes fine.

We now come to the subject more specifically connected with New Zealand, having thus stated a few generalities, and we find it necessary to divide the group into eight portions to distinguish all the local winds.

The formation of these islands, their comparative breadth at the parallel of the East Cape, with the narrow strip of land to the northward: the Strait, the high snow-capped mountains, and extensive plains and forest tracts, must produce varieties of currents of air; and we find frequent changes, though of short duration. But placed as these islands are, apart from any deserts or icy regions, the ordinary westerly current, unless blowing with unusual force, becomes neutralized by the varied configurations of the country's surface; and for this reason we purpose to divide the islands into eight atmospheric districts, namely:—

1st.—From the North Cape to Mercury Bay on the East coast, and to Kawhia on the West.

2nd.—From Mercury Bay to the East Cape.

3rd.—From the East Cape to Cook Strait.

4th.—From Kawhia to Cape Farewell.

5th.—Cook Strait.

6th.—From Cape Campbell to Cape Saunders.

7th.—From Cape Saunders to Foveaux Strait.

8th.—The West Coast of the Middle Island.

It has been frequently stated that New Zealand is a moist climate as compared to England, but if meteorological data during a number of years be taken as the basis of comparison, it will be found such is not the case. Persons residing in New Zealand during 1851–52, might conclude there was an excess of moisture; but had a person lived in the country in 1853–54 alone, he would come to an opposite conclusion, for the drought then was a source of considerable uneasiness.

Farmers do not complain there of excessive moisture. Indeed, at Auckland no more falls than is required to produce its prolific vegetation, although perhaps too frequent to bring grapes and some other fruits to perfection which thrive in other parts of the colony.

We believe that more rain falls in the West of England and on the West Coast of Scotland and Ireland than in any part of New Zealand.

The comparative absence of great intensity of electricity may modify the falls of rain. It is seldom such floods are heard of as accompany the thunderstorms of other regions. The greatest quantity of rain known to fall in twenty-four hours at Auckland within the

* The N.E. gale is a progressive cyclone; not a merely local wind.

three last years was less than at Sydney Heads. We have not been able to trace any accident occurring from lightning.

Fogs are rare, except in the extreme South. In the Bay of Islands and Hokianga there is a morning fog occasionally in September, October, and November, which generally clears up at 10h. a.m., and is followed by a fine day. In the Bay of Plenty we experienced a fog of three days' duration in the month of October, but it was considered quite extraordinary, and they have been experienced in the months of June and July in Hauraki Gulf, but seldom throughout the day.

1.—*From the North Coast of New Zealand to Mercury Bay on the East Coast, and Kafia (or Kawhia) on the West.*

In this division the ordinary wind throughout the year is from N.W. to S.W. on the West coast, and from W.S.W. it lasts longest. In summer the N.W. and S.W. are both fine. In winter the N.W. wind is prevalent, accompanied by rain. When the wind veers South of W.S.W., it blows from the westward off the shore on the East coast, otherwise the wind takes a direction down the coast. There is a sea breeze into Auckland and other harbours on the East coast in summer weather.

N.N.W. winds are accompanied by rain. The N.E. wind, already described, generally ends in a severe gale. S.E. wind is rare, but when it comes lasts several days, with cold, raw weather, sometimes showery.* In winter there are sometimes very sudden changes on the East coast after short intervals of calm. Cloudless serenity in winter is usually followed by a wet day; and a lunar halo is a sure prognostic of rain. The narrow interval between the seas on the West and East coasts and the extensive forests of Manukau conduce to moisture prevailing in Auckland to a greater extent than at the Bay of Islands. It is also for this reason Auckland is milder in winter, frost being uncommon; whereas at the Bay, though a lower latitude, ice may be found an inch thick occasionally.

In the harbours on the West coast the ordinary breezes are from S.W., with land winds in summer, which, however, are very light and partial. In Manukau the West winds are peculiarly fresh, the contour of the coast here forming the apex of an obtuse angle. The harbours on the East coast draw the sea breeze into their various channels in summer. In winter the weather is very variable.

During our experience the maximum temperature in the shade at Auckland in summer was 79°; minimum in winter, 40°; mean in summer, 67°; mean in winter, 52°. And the mean annual fall of rain was 43 inches.

* We found on an average of three years, that there were only twenty days with the wind between South and East. They were preceded by S.W. winds, and ended in calm. They occurred in April, May, June, and July. Although S.E. gales are common,—from a degree South of Auckland to the southward—we found only one blow home in the Hauraki Gulf (in June 1852). It lasted forty-eight hours.

2.—*Mercury Bay to East Cape.*

Between Mercury Bay and the East Cape the summer breezes are from the westward, dying away at night in and near the shore, but not in the Bay. A N.E. gale may be expected once a month, prevailing from March to July. S.E. winds are common near the East Cape, sometimes lasting for several days, and often very strong, but seldom blowing beyond the Mercury Islands. There is also a very strong S.W. gale, which is dangerous in the roadsteads between Cape Runaway and the East Cape; it is preceded by rollers and unsteady flaws of wind.

The people in sight of White Island can foretell weather by the appearance of the steam from Whakeri: with West winds the smoke is low, and more of it is seen. The S.E. wind, they say, smothers the steam. No doubt the density of the atmosphere tells on that vast body of vapour.

The climate of Mercury Bay may be considered fine, generally.

3.—*From East Cape to Cook Strait.*

Going from East Cape to Cook Strait a very marked phenomenon frequently takes place on rounding the East Cape. The strong westerly wind that drives across the bay carries its line a few miles eastward of the cape, but southward of this the breeze is N.E. Sometimes a vessel may be becalmed for hours between two strong breezes from West and N.E. The configuration of the coast at once accounts for this:—The West wind meets with little obstacle in crossing the narrow and comparatively low land North of the ranges forming the southern boundaries of the Bay of Plenty; at the East Cape it meets the lofty Ikouargi, and the breadth of the country now being considerable; the rarified air over it induces regular sea breezes from the N.E., succeeded in the evenings by the land wind for a short distance from the shore. An exception is the N.E. gale, known on this part of the coast as the black north-easter, to distinguish it from the ordinary sea breeze from the same quarter. In winter the sea breeze cannot be depended upon, and S.E. and South gales set in very suddenly, and even in summer the S.E. winds sometimes last for some days.

In Hawke Bay in spring there are fierce westerly winds for days, with a low barometer and variable weather, ending in a cold South wind, blowing hard for a short time, when the ordinary weather returns.

This part of New Zealand has a fine climate.

The barometer rises for N.E., S.E., and South winds, and falls for North, N.W., and West winds.

4.—*West Coast, from Kawhia to Cape Farewell.*

Along the coast of Taranaki the sea breeze sets in from W.S.W. to

S.W., drawing round to S.E. during the day and dying away at sunset.

A N.E. gale produces a northerly swell at Taranaki, greater than when at N.W.

N.W. winds blow very hard for about twelve hours, and then change to W.S.W., afterwards to S.W.

From November to April the weather is fine. In June and July S.E. winds prevail. Gales at any season seldom last more than forty-eight hours. Sometimes a N.W. swell sets in without the wind blowing home. The barometer rises for South and East winds, and falls for northerly, and north-westerly, which is the rainy quarter.

The proportion of N.W. to S.E. winds is about seven to four, which may be assumed as also the proportion of S.W. winds to all others on the West coast.

5.—*Cook Strait.*

In Cook Strait, that is, between Cape Campbell and Stephen Island, it may be said there are only two winds, N.W. and S.E. It is easy to account for the wind coming only from these two points, N.W. or S.E., by the configuration of the Strait, a channel of that direction, bounded by lofty hills on either side; but it is not so easy to establish the causes of the sudden changes with regard to the winds which are blowing outside the Strait. It may, however, be partially accounted for, if we suppose the ordinary ocean wind (W.S.W.) to be represented by the N.W. wind in the Strait until overcome by either of the winds prevalent on the near part of the East coast, namely, the black north-easters, the south-easters, or the South winds; either of these produce a south-easter in the Strait, and when the West wind is very light on the West coast, the N.E. sea breeze of the East coast draws through the Strait, forming the fine S.E. wind. The varied height of the mountains, the snow-capped Kaikoras, the extensive and heated plains must concur to produce great effects on the currents of air. The N.W. wind prevails with fine weather, the S.E. with bad weather: both often blow very violently, and succeed each other suddenly. The appearance of the sky indicates the approach of the south-easter by banking up in that quarter, and by the neighbouring mountains becoming capped with clouds There is also a fine S.E. wind. The finest months are April, August, November, and December. The most windy and rainy are May, June, and July.

Thunder and lightning are unusual.

The following information was obtained from Staff-Surgeon Prendergast, who kept a register at Wellington:—Average fall of rain in 1852, 49 in.; 1853, 67 in.; 1854, 39 in.: mean, 52 in. Maximum amount of rain in one day 2 in. During the same period the barometer (at the sea level) maximum, 30·67; minimum, 28·81: range, 1·86 in.

The following Table of the winds was made from observations at Wellington, in 1854:—

Year.	N.N.E. to N.N.W.	N.W.	S.W.	South.	Calm or Variable.	Gales.
1852	..	225	..	141	..	29
1854	..	221	..	144	..	15

There were fifteen shocks of earthquake in 1852, and twelve in 1854.

The Meteorology of Nelson was observed during eleven years by the late Samuel Stephens, Esq., to whom Captain Drury was indebted for the following information on that subject.

The prevailing winds are:—

January.—N.N.E. to N.N.W. S.E. to N.E.
February.—N.N.E. to N.N.W. S.W. and S.E. to N.E.
March.—N.N.E. to N.N.W. Variable and calms.
April.—N.N.E. to N.N.W. S.E. to N.E.
May.—S.W. Calms and variable.
June.—S.E. to N.E. Calms.
July.—S.E. to N.E. Calms.
August.—N.N.E. to N.N.W. S.E. to N.E.
September.—S.E. to N.E. and S.W.
October.—N.N.E. to N.N.W. S.E. to N.E.
November.—N.N.E. to N.N.W. S.W.
December.—N.N.E. to N.N.W.

It appears that the N.W. of the Straits is represented by N.N.E. to N.N.W., and the S.E. by S.E. to N.E., and that Blind Bay is only partially affected by the gales in Cook Strait.

For the years 1852–53 we have this proportion:—

Year.	N.N.E. to N.N.W.	N.W. to West.	S.W.	S.E. to N.E.	Calm or Variable.	Gales.
1852	110	35	62	99	60	28
1853	107	34	45	96	83	21

The N.E is the rainy quarter (southward of the Strait). It is the N.E. gale of these seas; and is but of short duration, veering to N.W. and S.W.

The common S.E. wind of the Strait seldom blows home to Nelson.

The ordinary sea breeze begins from the westward, working round to N.W., and drawing to N.E. at sunset. At Nelson the strongest gales are from S.W.

Rainy weather is generally indicated by vapoury clouds hanging on the hills. When strong gales occur without rain, they are often preceded by a red, wild, and lurid sky. These come mostly from the westward.

The maximum amount of rain was in May 16th, 1853, when 3⅛ inches fell in eight hours, the barometer falling to 29·08; on common rainy days, about three-quarters of an inch falls in twenty-four hours.

The average fall of rain in 1852–53–54, for each month, was as follows:—

January, 2·69; February, 2·78; March, 2·53; April, 2·45; May, 3·41; June, 3·37; July, 2·53; August, 3·24; September, 3·87; October, 3·51; November, 2·56; December, 3·44. September, October, and December being the most rainy months. Snow rarely falls on the low lands about Nelson, but the mountain ranges are covered for months. The barometer falls considerably previous to snow storms, which occur in the end of May and June.

Thunder clouds proceed from S.E. to N.W. Thunder occurred on forty-two days during three years, chiefly in January, September, and December. Fogs and misty weather are rare. Dews occur at all seasons. The temperature at Nelson was as low as 26° during three days in August, 1854; the wind being S.S.E. The highest range was 87° in February.

The greatest amount of pressure was 30·50 in April; wind S.E. to S.W. The lowest 28·74, on May 17th, 1853, with much thunder and lightning.

The following Table is from observations in 1852–53–54.

Year.	N.N.E. to N.N.W.	N.W. to West.	S.W.	S.E. to N.E.	Calms.	Gales.
1852	110	35	62	99	60	28
1853	107	34	45	96	83	21

N.B.—These observations were made in the town of Nelson, 120 feet above the sea level.

6.—*Cape Campbell to Cape Saunders.*

About Lyttelton, nearly central in this district, we find the summer sea breezes blow from the N.E. with hazy weather, occasionally changing to N.W. for two or three days. The summer sea breeze dies away at sunset, and is succeeded by a light S.W., springing up about midnight, which lasts until 9h. a.m.

In winter the prevailing winds are S.E. at sea, but at Lyttelton and Canterbury the wind is S.W., while at sea it is S.E. In spring and autumn the winds are variable from N.E. for two or three days, with very fine weather; then light winds for a day, shifting to N.W., blowing a gale from twelve to forty-eight hours; then a sudden shift to S.W., strong wind and rain for three days, when it comes round again to N.E. along shore.

Fortunately it seldom blows strong from East, but even light winds from that quarter produce a heavy swell in Port Cooper. This wind is accompanied by fog and misty rain.

The violent S.W. wind in this harbour off the land is accompanied with more danger to shipping than any wind that has blown in. In December we experienced a south-easter between Canterbury and Otago. It fell calm for an hour, when the S.S.E. wind came up suddenly, and with little warning; it veered to S.S.W. This S.W. wind corresponds to the south-eastern of Cook Strait.

It is very necessary to be aware of the prognostics of the sudden changes along this coast, especially the north-wester, which comes on at once to blow furiously. The most unmistakeable sign is a remarkable transparency of the atmosphere, which is very clear indeed.

The N.W. wind of this district resembles the sirocco of the Mediterranean; it comes on suddenly, and changes the temperature in a few minutes from 12 to 20 degrees. This change in the temperature perhaps arises from the rapid melting of snow in crossing the Southern Alps, or from crossing heated plains.

The S.W. wind is preceded by heavy, hard-edged, dark cumuli in that quarter. At sea this is probably S.S.E.

Again, the mountains are clouded in a south-easter, and partially in a south-wester:—while all distant objects, including the Kaikoras, are distinct, with a fine blue tint, on the approach of the N.W. wind. The finest months are December, January, February, and March. Rains and gales are chiefly in June, July, and August. The rainy quarter is N.W. to S.W. The hot north-wester in summer frequently terminates in wet. There is also a wet and a dry south-wester. In autumn or winter the barometer rises very high, with light East winds, producing fogs and much rain, lasting ten or fourteen days.

The barometer is very variable on this coast; its fluctuations amount almost to a puzzle on shore. It is supposed the lofty mountains must have some share in producing local pressure, as the mercury is frequently moving, though no apparent atmospheric disturbance takes place.* The following remarks are specially applicable at sea. In winter the mercury falls previously to a S.S.E. or S.W. gale, but immediately before commencing it rises, and when at its greatest height the gale blows strongest. In winter such a gale brings continuous rain for three days; but in spring and autumn severe squalls, with rain, hail, and sleet, the glass remaining high, and it is succeeded by N.E. wind and fine weather. The mercury falls before a N.W. gale, especially if followed by a wet S.W. wind: the change is often immediate. It is very low when snow falls, although without wind.

At Lyttelton the barometer has been very low for many days without any change: it has been at its highest with very bad weather, and soon after at its lowest with very fine weather. It appears that the cyclone north-easter does not occur above four times a year, then the rain from this quarter is heavy. The greatest fall of rain yet known in twenty-four hours was 2·14 inches in April, 1853.

The uncertainty of the weather is shown to be remarkable by the

* Similar effects have been noticed near Tierra del Fuego.

following example:—The rain that fell in,—April, 1852, 3·09 in.; April, 1853, 9·40 in.; April, 1854, 1·08 in.

April is considered a fine dry month, but in 1853 more rain fell than in any other month. Snow rarely falls on the plains, but it has fallen in May, July, August and September. In August, 1851, there was a heavy fall of two inches deep, that lay all day. Thunder and lightning are rare. Their clouds proceed from N.W. or S.W., with dense cumulo-stratus. This occurs in spring and autumn.

The temperature at Christchurch has been as low as 27° (June 10th, 1852); the highest was 91° in the shade on February 1st, 1854, at 3h. p.m. The greatest amount of pressure was 30·64, August 14th, 1854; the least pressure, 28·85, May 17th, 1853.

The following Table is from observations in 1852–53–54, at Christchurch:—

Year.	N.N.E. to N.N.W.	N.W. to West.	S.W.	S.E. to N.E.	Calm or Variable.	Gales.
1852	4	20	112	119	110	..
1853	6	21	115	120	103	..
1854	5	27	99	151	83	..

On only two or three days in each of the years 1852, 1853, and 1854, was any thunder heard.

It has been a matter of surprise and speculation that the hot N.W. winds proceeding directly from the snow should produce considerable heat, instead of (as would appear natural) an opposite sensation; nor can it be accounted for by the air traversing the plains, as the heat is found fully as sensible and perhaps more so at the foot of the snowy range.

We may, perhaps, account for it thus:—We find this hot N.W. wind is preceded by cloudless serenity; therefore a great deal of radiation is taking place. The melting surface of the snow covering the heights releases latent heat, causing the atmosphere to become highly rarefied, which consequently rises, but, meeting an upper current, becomes cool and condensed, and rushes towards the coast, carrying at first a portion of the lower strata of caloric, the immediate sensible precursor of the gale. In a few hours the equilibrium is restored, and condensed moisture falls in rain, which is frequently the termination of the gale.*

At Akaroa this gale is seldom felt, being sheltered by the Peninsula mountains. In this place the sea breeze follows the bends of the harbour. S.W.† gales follow N.W. winds, and blow very hard. The

* Perhaps this hot wind is a tail of an Australian "brickfielder." Compare relative positions on the map; and consider the direction from which this remarkable wind blows. It is not felt far North or South of this particular section of New Zealand.—R. F.

† S.E. outside and in Cook Strait.

land wind has more than ordinary strength in passing Akaroa Heads in the morning.

At Otago no register appears to have been kept previous to 1854.

Our information regarding the weather there is gathered from an intelligent pilot, who resided sixteen years near the Heads.

North winds are rare. The ordinary sea breeze is N.E. It seldom blows from East.

S.E. winds are accompanied by thick, hazy weather, but seldom blow home.

South winds do not blow strongly, unless they veer to S.S.W. and S.W.

The winds off the land are the strongest, and W.N.W. winds blow the hardest, the latter being at times a hot wind. The squalls from this quarter are heavy.

The heaviest gales are in November, often with large hailstones.

The dirtiest weather is in June and July. January is the hottest, and July the coldest month. Snow falls and lies on the ground for two or three days in June, July, and August. South to S.E. is the rainy quarter.

The pilot considered that there are about thirty days in the year when it would not be prudent to cross the bar because of the swell, which is worse in attempting to leave. He states that 1853 was a peculiarly dry season. It is curious that in that year there should have fallen at Canterbury nearly double the annual average amount of rain, and that in all other parts of New Zealand it was remarkably dry.

The effects on the barometer may be generally assumed as similar to those of Canterbury, allowing for 2½° higher latitude: At Otago there is much more fog.

7.—*Cape Saunders to Foveaux Strait and to* (8.) *the West Coast of Middle Island.*

There is less information of the weather in this district. In the summer season the N.E. winds and Otago weather extend to the Traps; but after passing the meridian of Stewart Island, a very different climate may be met with. We found on two occasions that on approaching the West coast, N.N.W. gales blew down the West coast, with thick foggy weather.

It is said that in summer easterly winds blow occasionally for six weeks at a time. It is, therefore, as well for vessels bound eastward at that season to pass considerably South of this latitude, unless it is wished to make a landfall.

We may allow the district between Hawke Bay and the East Cape the superiority of climate; although that of Nelson is more bracing.

The Bay of Islands claims an exemption from the ordinary humidity of the northern district.

Auckland is subject to more moisture, although no more rain falls than is necessary for the prolific vegetation, which its excellent soil and delightful temperature produce.

The summer during two years, 1853 and 1854, was even too dry, threatening a drought.

Having concluded this statement of the Meteorology of New Zealand, as far as we have been able to collect facts from imperfect observations, and our own knowledge of the coast, we may remark that the climate is in general peculiarly adapted to colonists of our race. That the navigator will experience frequent changes, but is well warned by certain prognostics with the assistance of his barometer. That all gales are of short duration. And that the temperature throughout the year is so equable, especially in the northern portion, that it is difficult to define the limits of summer and winter.

Description of the Amoor River, with Particular Considerations Geological, Zoological, and Botanical.—*By Permikin.*

(Continued from vol. xxvii., page 635.)

[Mr. Permikin took part in the expedition of the year 1854, which went down the Amoor from Ust Strelotschnaja to its opening into the Gulf of Tartary, and was commissioned by the government to examine the stone formations near the banks; and by the Geographical Society to collect minerals for their museum. On account of the quickness of the journey, it was impossible to fulfil both purposes very amply. The expedition kept chiefly to the left bank of the river, and the researches could only take place on that bank during the nightly haltings. It was impossible, for this reason, to state, even approximately, the direction of the branches of the large Chin-Gan range (Dachin-an-schan), which projects on the Large Gorbiza, and sends its arms along the chief tributary streams of the Amoor, as the Seja, the Numa, and the Aemgun. The following is an extract of the journey-diary of Mr. Permikin, published in the *Memoirs of the Imperial Russian Society*, containing the essential geographical notices.]

On the 29th May (new style) in the afternoon, the expedition arrived near the Schilka in Ust-Strelotschnaja. On this tract four important rivers—the Kara, Tschernaja, Little Gorbiza, and Scheltucha—enter the Schilka from the left side. The banks of the Kara are known by the rich gold-diggings, belonging to the crown. Forty versts before the Schilka unites with the Argun, the former makes a sharp turn to the South. One of the branches of the Stanowoi range winds round the valley of the Venon, goes to the Schilka, and forms on both banks an uninterrupted irregular range. These mountains were covered for the greatest part with dense foliage and underwood, and from the rapidity of our journey it was very difficult to state, after the open places had been passed, anything about the general character

of the banks; and impossible to say anything certain about the deposits, the thickness, and the extension of the layers.

From Schilkinsk downward to the Little Gorbiza, limestone of a grey colour prevails on both sides, amongst which is included white marble in considerable thickness. Farther appears, instead of the lime species, granitic syenite, and syenitic porphyry. The former is remarkable for including crystals of feltspar, which have the shape of a rectangular parallelopipedon, and are above an inch in size. At some places the syenite has changed into diabas, and these two species occur in a tract of seventy versts. Then the layers change to quartz, after which appear again granite, then glimmer-slate, which is to be found on a tract of fifty versts. Farther occurs chlorite-slate, serpentine, talc-slate, and then slate. The latter forms big rocks on the right side, which come to the river; they are interwoven by differently coloured veins of quartz. The shore species on the left bank of the Schilka, as well as those on the banks of the tributary rivers, witness to the existence of precious metals.

The distance from Ust-Strelotschnaja to the mouth of the Great Gorbiza (Amagara) is fifty versts. After making from twenty to forty versts at the mouth of the Great Gorbiza, on the left bank, the ships stopped. At the first place was found slate with a layer of a black colour, which was not to be recognized, changing into silicious slate, and having quartz veins. At the second place likewise slate, but glimmery, of a dark gray colour, with irregular formation, and quartz veins. At the last of the night resting-places, everywhere simple black slate, changing likewise into silicious slate.

Generally speaking, one might call the country we passed through mountainous; the banks were almost everywhere stony. Above the Gorbiza, enters from the right side a considerable by river. The Amoor flows steady in a deep bed, and large ships and steamers may conveniently pass

(Seventy versts.)* 31st May.—Twenty versts from the night resting-place, we met on the left bank sixteen Orotsches, people from the Tungusian tribe, who are tributary to Russia. Further we met single Tungusians in boats of birch-bark. They belonged to the tribe of the Mauri, and paid, as it appears, only a small tax to the Chinese collectors. We presented them with some spirits, which acted very strongly on them, and with some small articles of ornament. One of them spoke, beside his native tongue, the Russian, Chinese, and Manchurian languages.

(180 versts.) We made this day 130 versts. From the left side two rivers more enter the Amoor, of which one seems to be of considerable width. The hills on both sides became lower; they approached partly, as before, the river closely,—partly they retired from it, by which small meadows are created near the banks. The hills were

* The distances placed within parentheses relate always to Ust-Strelotschnaja.

overgrown with different timber, as larch trees, pines, and, in some places, birches. The low banks of the Amoor are bordered with willow and red-berried elder. The banks of the Amoor from Ust-Strelotschnaja to here are, generally speaking, unfit for settlement, although perhaps beyond the southern boundaries valleys may be found fit for agricultural purposes. On this whole tract were collected stone species at five places. Eighty versts from Ust-Strelotschnaja was found likewise sparkling slate, of a dark grey colour, and shining on fracture; the masses of it are intersected with quartz veins. At 100 versts was found slate of a dense texture; and at 180 versts appeared the slate in an irregular formation, its colour being dark, dyed by oxide of iron. All this relates to the left bank.

(237 versts.) On the 1st June we arrived at the place where once Albasin (Taksa) stood. On the right side, above Albasin, the Emuri (Albasicha) enters the Amoor. The hills on the right bank of the Amoor lower towards the Emuri, the right side of which is formed by meadows. Before the mouth of the Emuri, a low island, two versts long, has formed itself, on which may yet be recognised the traces of the batteries erected by the Manchu-Chinese against Albasin. The country of the old Ostrog consists of sandstone with distinct prints of plants. Behind Albasin one sees for the first time another vegetation. On the southern slopes of the hills the larch tree changes for oak and black birch, and at the foot of the hills one sees hazle-nut and elm, bordered with willow, ash, and wild-rose. However, the vegetable cover of the ground bears yet the stamp of the Daurian flora.

The Manegrians, of whom we met here a few hamlets, looked at our passing by quite indifferently, although certainly the steamer, with a long row of boats, must have been to them a new sight. Not even the music lured them from their occupations. We made this day 144 versts to the valley of Buringa. At this place one meets everywhere the same coal sand stone. The hills surrounding the valley Buringa consist for a great part of sandstone and conglomerate,—in the latter is to be found slate, small parts of silicious slate, of quartz, and of horn-blend, inclosed in chlorit cement. At the South side of the hills grows weak oak and black pine, bordered with wild rose; at the northern side white birch and ash; on the summits fir and larch trees. The uppermost layer of the valley consists of rich black earth; a few early flowers were already in blossom; on the hills were in blossom the white poppy, the mouse-ear, and the Daurian rhododendron. The edge of the valley Buringa, which is washed by the Amoor, is on its whole extent slimy-sandy, and fit for settling. There are to be found yet the traces of the former Russian village Andruschkina.

The 4th July we continued our journey. In the Amoor began to appear small islands, covered with poplar, ash-tree, and willow. At eight o'clock in the evening we stopped at the left bank: this was one of the finest landscapes we had hitherto met with. An open valley is encircled by the rivers Toro and Augan. On the banks a few Manegrians roam; also we saw a small drove of horses. The territory near the banks which we looked on to-day is very fit for agriculture

and breeding cattle. The bank valleys are surrounded amphitheatrically by steep hills, which approach at several places to the bank, and end in perpendicular cliffs.

The order of the vegetation is here again quite the same,—the summit of the mountain is covered by oak and larch; on the slopes grow oak and black pine; in the lower situations ash trees and several shrubby plants. The flowers were not remarkable for their variety, perhaps because the spring was just beginning. We saw very fine white ponies. The cliffs on the left bank consist chiefly of granite, mixed with feldspar and veins of smoke-coloured quartz, without any addition of glimmer. We made 110 versts.

(531 versts.) Forty versts farther, at the mouth of the Onon, Manegrians are found in seven hamlets. Where the hills were bare there appeared granite, sometimes with an admixture of feldspar, which was coloured by oxide of iron. We passed the sand hill Zagajan, which is situated in a curve on the left bank. One of the Manegrians told of a miraculous peculiarity of the hill: as soon as a man approaches it it vomits smoke, but when the man retires the hill ceases smoking. The river population—all of the Tungusian stock, and all given to Schamanism—pay to this wondrous hill a particular veneration, and maintain that it is the dwelling-place of an evil spirit. The mountain extends for three versts, but could not be inspected nearer, and it can only be suggested that the smoke originates either from self-combustion of coal layers, or that the mountain contains excavations, as this is the case with lime hills in many mountainous countries of the Eastern Siberia, and that by the exterior air becoming cold the warmer air comes forth from the excavations in the shape of smoke. The hill consists of sandstone. At its foot layers of conglomerate are to be seen, in the accumulation of which agates are found.

Passed the rivers Mardali, Hakan, Great Vagan, Schagdscha; arrived in the neighbourhood of the river Bulkun. 106 versts.

(597 versts.) This country bears another character,—the wide valleys at the banks of the river enlarge, the steep hills retire more and more, the meadows are covered with a nourishing grass. At one of the halting-places the bank was stiff clay, at the last one slate was to be seen. The number of islands in the river augments. Now, the river runs strongly to the South. The curves are so sharp to S.W., that one appears sometimes to go backward. Wide, partly high valleys, low islands—the trees appear like oases, poplars, ash-tree, wild-apple *(Pyrus spectabilis)* occur alternately with shrubs of red-berried elder, sand-willow, and hiss. On the hills grow small oaks *(Schwache Fiche)* and black-birch; larch and pine become more scarce. The meadows are covered with exquisite grass. In these extensive valleys numerous flocks of cattle could be fed, but till now life shows itself only in the powerful activity of nature.

(633 versts.) We arrived at the Kamara (Chamara, Chumar-Bira) which enters the Amoor from the right hand. According to the statement of the guide, its course is longer than 300 versts. Here, where as early as 1651 an Ostrogian, Chabaroff, founded Kamarok, a mili-

tary post is established. Two jurtes made of birch-bark are standing on a landstreight, but nobody was in them.

(709 versts.) Seventy-six versts below the mouth of the Kamara there is on the left bank of the Amoor another military post, consisting of three huts. Before them, which are built of wood and covered with rush, stands a house of worship, which, according to the suggestion of the sinologue Sytschewski, who accompanied the expedition, is an offering altar dedicated to the god of war (Huanlo). The inhabitants had left the houses but recently.

(826 versts.) 117 versts farther, on the right shore of the Amoor, is situated the village Amba-Sachalgan, consisting of twenty-three houses. The travellers profited by the halt for the night at the opposite bank to visit the village. Four old men, two old women, and three young people came to meet them, all the rest of the inhabitants running away. The scattered houses were badly built of wood, rushes, and clay; instead of glass there was oiled paper in the windows. In the rooms were painted on linen cloth, pictures of the Budhist gods and of the Foist; on the walls others of bad Chinese workmanship, between which were applied light cupboards for keeping of the household stuff. Near each house were clusters of trees, birches, elms, maple, acacia, and the incomparable *Pyrus spectabilis*. Each house has its garden, of which much care is taken. Different varieties of millet and Indian corn were sown. In the smaller beds grew radishes, leeks, garlic, Spanish pepper, beans, and late greens. Particular interest was excited by two new species of cabbage. Of cattle and horses were seen but few; but many swine of a peculiar kind and fowls.* The country near Alba-Sachaljan is in general flat; the bare banks are shiny and sandy; to be seen round about are wide valleys, here and there hills, the mountains far retired, little wood, the soil exceedingly well adapted for agriculture.

The other day we had scarcely got down the cape to the left, when was offered to our view the unbounded valley of the Seja, the borders of which lost themselves in the immeasurable space. Looking toward the right side of the Amoor, it appeared as if this valley extended to the middle of Mantchuria. The Seja enters from the left side of the Amoor with a gigantic mouth; their waters flow as a large girdle into the low valley. "This point was incomparably beautiful; I never had seen the like," says Mr. Permikin. The Amoor increases considerably in depth and width by the plentiful supply of water. If the country of Albasin, the mouths of the Kamara and Aengun are fit for settlements for several reasons, the valley of the Seja surpasses the others in every respect. The Russians discovered, in the seventeenth century, the upper Seja by passing from the river Tugur over the Chin-Gan; then they occupied gradually the whole valley of the Seja to the Amoor, a distance of more than a thousand versts, and established four Ostrogs,—Werschneseisk, Selembinsk, Giluisk, and Dolonsk. According to an account from the year 1681, iron ore is said to be found in the white mountains, half way between the mouth of the Seja and the Selinga, which enters it.

(856 versts.) Thirty versts from the mouth of the Seja the town Sagalien-ula-Choton is situated. On the whole tract to this town are small villages, consisting of a few houses,—one of them extends for five versts along the bank. In the neighbourhood of the houses we perceived at many places cultivated fields. Both banks of the Amoor are of slimy sand; in the sand accumulations of the river occur agates and cornelians. At the harbour, a little above the town, we found thirty-five large boats, several of which could carry 300 pud. Several members of the expedition begged permission to visit the town. At the landing-place they were received by the Amban and three officers, who invited them to a tent, before which rose two banks. Near one bank certainly all the soldiers of the place were assembled; their number might amount to about 1,000. They carried long poles with sharpened and often blackened points, which were meant to give them the appearance of pikes. A few of them had clumsy, heavy swords; a very few were armed with small carbines; most of them had in their hands small bows, and on the back a quiver and arrows. At a little distance from the hut stood ten guns, on carriages with large wheels and of clumsy make. Each of them was covered with a pointed roof of birch-bark: carriages and roof were painted red. Beside each gun stood a man with a stick in his hand, but it was not possible to see whether it was a simple stick or a match. The Amban refused the strangers permission to see the town. During the conversation the soldiers thronged in such numbers into the tent that they required to be driven out thrice by the use of sticks. Opposite the lower town is an island, on which one may see traces of an earthen wall. Here the Manchu-Chinese had built a fortress in the seventeenth century to hinder the excursions of the Cossacks on the river.

(861 versts.) Five versts below Sagalien, on the left bank, is a large village, which, as was said, forms a suburb of Sagalien, and is named Aigun. In the seventeenth century it had the same importance which Sagalien has to-day. When the Cossacks advanced on the left bank, it was deserted little by little, and after the peace of Nertschinok, Sagalien was built by order of the Emperor.

From the mouth of the Seja the valley on both sides of the Amoor extends The banks are perfectly low; here and there occur hills; the blue mountains vanish into the horizon. The low places are covered with marsh, between which occur small lakes, bordered richly with bulrushes. After the opinion of Mr. Magister Herzfeld, the botanist of the expedition, the Daurian flora, predominating to the mouth of the Seja, changes now decidedly for the type of European vegetation, which lasts to the mouth of the Sungari. Here grow lime, poplar, cornus mascula, bryonia alba, and several other species. Hazelnut, oak, black birch, still also occur. It is to be noticed that on the banks only low trees and shrubs grow, but in the villages and gardens of the Manchues tall poplars and elms, which are planted by men and which are to be seen very far in the low valleys.

(901 versts.) Forty versts from the mentioned island, the Amoor turns to the East and a little later to N.E. The banks are slimy-

sandy, the upmost layer of the ground consists of a rich black soil, which has at some places a thickness of half an arschine. The valley on the left hand is perfectly open, and extending out of view. On the right side is, behind the open country, the range of the Little Chin-Gan Ridge to be seen, a branch of which, Tichuri-Alm, rising in the district of the Daurians, approaches near Sachaljan-ula-Choton, and continues in an uninterrupted chain eastward, by retiring from the banks of the river. The branches of the Tichuri-Alin, steep and woodless, send, near the town, their arms yet farther to the East, lowering very much. Their slopes are covered with wood, the black belt of which is bordering the valley sharply.

At its turn to N.E. the river forks. Here and there appear small villages, consisting of two or three mud hovels, habited by some Manchurian fisherman with his family. The population is probably formed by exiles,—a Manchurian, at least, who was visited by Mr. Permikin, appeared to him to be such an one. His dwelling, the numerous nets, and the garden, witnessed his being well off.

The country between the mouth of the Seja and the Niomanbira* reminds one of the middle zone of European Russia. The immense space which we had seen in the last four days is able to hold a large population, and all the exigencies for agriculture and breeding cattle are at hand. Besides, the Amoor has an inexhaustible abundance of fish.

(To be continued.)

The Conveyance of Troops to India.

Mr. Editor,—In your number for January last you favoured me by an insertion of four different plans for the safe and rapid conveyance of troops to India. It is much to be regretted that little seems to have been done in the interim in the way of those improvements therein suggested; but it may be as well, after the lapse of a year, to consider what really has been achieved in effecting that important object. Although, on the most urgent occasions, many have been forwarded by steamers, both overland and round the Cape, yet the general plan adopted seems to be that which I called No. 4. This comprises the employment of the fastest sailing vessels, taken up at the lowest price, at so much per man, varying from about £9 10s. to £11.

It is some satisfaction to observe that since those several plans appeared in the *Nautical*, the system of employing those dull sailing vessels has been given up; one that kept the troops six or seven

* The manner of writing Nioman often changes for Numan.

months on the passage certainly was not in keeping with these times, when celerity and economy are the order of the day. Adopted it certainly has been, and whether by an accident or not, the *Nautical* may be congratulated in pursuing one of the principal duties of a professional publication in pointing out defects when there appears to be no nautical man employed in this very important branch of the public service.

Since the change which has occurred at the East India House, there is still no nautical authority or Transport Board of any kind to be responsible that the transports with troops are sent off in a proper condition for going to sea; and, notwithstanding the large number of troops sent off, there is but one individual, should orders to the contrary not be given, of the profession who visits those vessels officially, but whose authority merely extends as far as the space allotted for accommodation, and the inspection as to the proper quality of the provisions for the voyage. Consequently, in both of these particulars there is nothing to complain of, excepting the ill-judged plan of sending porter for troops instead of grog, which was formerly allowed, under proper restrictions. The porter of course always becomes sour directly it reaches the warm latitudes.

Now, Mr. Editor, in my opinion, unless we are content to hear of continued losses by disasters at sea, it is absolutely necessary that a regular Transport Board or Committee should be formed, which alone should be responsible that these vessels are in all particulars properly equipped in every respect for sea, and fit to encounter the worst of weather. For this Committee or Board three first-rate men who have commanded India ships, and who have made the most rapid and successful voyages, should be selected, and with them should be associated a military officer who has been round the Cape with troops. A regular contract and certain regulations should be drawn up as to manning and all matters pertaining to the outfit of these ships, and strict inspections of them should be made previous to the embarcation of troops, not only as to mustering the crew, but also the state of the hull, spars, anchors, cables, sails, cordage, stores, &c. The lowest tender should not be taken unless the ship is proved on examination and survey to be in every way adapted for the service, and the soundest and best sailing ships should have the preference, although offered at a somewhat higher figure than others. When contracts are taken low they invariably work, in some way or other, to the detriment of the public service. Shipowners should be properly paid, and then stringent rules may fairly be exacted of them. Among these, the principal objects to be kept in view are:—The number of foremast men to be in the ratio of four to every 100 tons register; foreigners should not exceed one-fifth of the crew; a strict inspection as to masts, yards, sails, and spare spars; anchors and cables, the weight of the former and length of the latter, trim of ship, &c. And this Transport Committee should be responsible that the ship is in every respect ready for sea, with her proper outfit, complement of men, and

spare stores, before she is reported as being ready to receive troops. A measure of this kind, well enacted and strictly carried out, would prevent immense losses, as well as accidents and delays.

In my remarks on this subject last year it was recommended that troops should only be forwarded in the summer months; but as it has been found in practice that, having no large standing army, we are obliged to adopt the hand to mouth system, and send off recruits as they are raised, it is advisable, in the winter months, to spare them the miseries of a long beat down channel. Troops, from September to April, therefore, should not embark at Gravesend; but the transports should proceed to West Cowes, and take them off from thence,—a depot for recruits being formed at Newport, in the Isle of Wight. From hence Government steamers should tow them through the Needles, and, if the weather proved favourable, might take them on beyond Portland or the Start, and, in fact, see them fairly off. This would set them on probably a month in their passage, and save great expence in wear and tear, as well as the disgust and discontent likely to arise from tedious delay in bad weather on first entering service.

It is to be hoped, Mr. Editor, that some of the valuable remarks to be found in the *Nautical* will fall into the hands of those who have the power and influence to prevent the enormous amount of suffering and imminent risk of loss among our troops, by establishing some system of uniformity in their conveyance to India. It is a service which, if taken up in the proper spirit, is easily managed; and, although among the Council there is not one nautical man to take the matter in hand, yet by a judicious selection of a committee under their authority, as above proposed, there is no reason to doubt that the duty of sending troops to India by the most approved system would be efficiently and faithfully performed.

I am, &c.,

TRIDENT.

To the Editor of the Nautical Magazine.

[There is much in the foregoing letter deserving attention. Nautical business required to be done properly must be done by nautical men. Thus, a close inspection, as recommended, would have prevented such a disastrous state of things as occurred in the *Bombay*, the log of which, as it appears in the *Shipping Gazette*, we append as a dismal contrast to what things should be. It is heartrending to know that the seamen who lost their lives by masts going over the side, as they did in the *Bombay*, were all British seamen, the only men capable of doing a seaman's duty,—the foreigners on board being mere landsmen,—their reward for being foremost in their duty on board a British merchant ship! Sad degradation this, and sad indication of the state of things in that important branch of our marine. Let us hope that such a state of things as this will be remedied by those who are so alive at the present moment to the shipping interest.]

After her encounter with the late fearful weather, the dismasted ship *Bombay*, Flamank, arrived in Plymouth Sound at 3.30 a.m. on Sunday, December 5th, in tow of the steam-frigate *Argus*, Commander H. F. W. Ingram.

The *Bombay's* jury foremast consists of a spare spar about forty-six feet long; the mainmast is a maintopgallantmast, and the intended mizen a jibboom. The original fore and mainmasts broke a little below the deck, in the partners, on the 16th of November, when Mr. Paul and sixteen others, the best of the crew, were aloft, furling sails: of these six only regained the ship. The mainmast went over the starboard side and the mizenmast over the stern. The foremast was carried away on the 23rd. Mr. Joseph Alcock, Quartermaster, was knocked overboard and drowned on the 2nd December, while assisting to prepare to step a jury mizenmast. A considerable portion of the crew consisted of foreigners, including Cephalonians, Italians, Spaniards, Dutch, Prussians, and Germans. None of the cargo has been thrown overboard. The pumps were constantly attended to throughout the storm, and at this time the *Bombay* does not make an inch of water per hour. She had a fair passage from London to Cork, off which she arrived on the 10th of November. The subsequent details are given in the following abstract from her log:—

Nov. 10th.—Made Ballycotton Light at 7h. p.m. Strong gale from the East, with heavy short sea.

11th.—Strong gale, heavy squall, ship labouring violently; carried away foretopsailsheet. At 2h. a.m. split sail. At 4h. tremendous gale, ship labouring and straining most violently. At 5.30 a.m. parted maintopsailsheet, split the sail to ribbons, and carried away mainroyalmast.

12th.—Continued strong gale. 3.20 p.m., Fastnet Rock Light N.E.b.N.½N.

13th.—A.M., still strong gale from E.S.E.; p.m., decreasing breeze, heavy, threatening appearance.

14th.—A.M., increasing breeze, heavy squalls.

15th.—Still increasing; sea getting up very fast.

16th.—Perfect hurricane, tremendous sea; 2.10 p.m., while Chief Mate, Mr. Paul, and some of the hands were furling split maintopsail, ship was struck by a heavy sea, causing her to lurch so fearfully as to roll the main and mizen masts away by the board, throwing every one aloft into the sea, and smashing and rendering perfectly useless all the overside boats—three. Every possible effort was made to save the people, but succeeded only in saving six.

17th.—Decreasing gale; ship labouring very heavily. 4h. p.m., carried away jibboom at the cap.

18th.—Decreasing gale and less sea; ship not rolling so heavily. 4.30 p.m., barque *Port Glasgow*, of Poole, offered assistance.

19th.—Moderate breeze, with thick passing squalls; at 5h. a.m. attempted to haul the ship to the wind, but could not do so, as she laboured so violently.

20th.—Calm, fine clear weather.

21st.—Light breeze, passing squalls from southward, with a heavy swell. At 4h. p.m. the ring-bolts, to which all spars were lashed, gave way; the spars went to leeward, and broke the two remaining boats.

22nd.—Increasing breeze. Sea getting up; ship rolling as violently as before; fresh breeze; tremendous swell.

23rd.—7.30 a.m., ship rolling heavily. Sent foremast over the side, taking topmast and foreyard with it. Cut the wreck away from the ship's side, saving as much of the rigging as possible. Got up jury mainmast, and set the topmast studdingsail on it. P.M., cleared away some of the spars and lashed the remainder for the night.

24th.—Strong gale, ship labouring heavily. Spoke the American barque *Alice Prevost*, which offered to stop by us during the night.

25th.—Strong breeze, heavy squalls; midnight, more moderate.

26th.—Passing squalls.

27th.—Light breeze and fine. Rigged shears for stepping jury foremast. Midnight, spoke brig *Pilgrim*, from St. John for Liverpool.

28th.—Increasing breeze, heavy squalls; ship labouring violently, and rolling so much that it was not considered prudent to attempt to step the masts.

29th.—Weather moderated; stepped the foremast, and set lower studdingsail for a foresail.

30th.—Increasing breeze and fine.

Dec. 1st.—Shifted the shears aft to get in mizenmast; p.m., strong breeze and squally; split foresail; shifted it with a new maintopgallantsail.

2nd.—Moderate breeze; thick rainy weather. Got shears over end and mizenmast ready for stepping. While employed doing so, Joseph Alcock, Quartermaster, who was on the poop, was struck by a spar and knocked overboard. Having no boats, he could not be saved.

3rd.—Ship labouring so violently it was not possible to step the mizenmast. 8h. a.m., increasing breeze and cloudy. At noon H.M. steam-frigate *Argus* offered assistance. At 4h. p.m. attempted to pass a hawser, but there was so much swell that the hauling line was carried away; did not make a second attempt. *Argus* remained near all night; moderate breeze and cloudy.

4th.—Moderate breeze and fine. 8h. a.m., passed a hawser to the *Argus* and received one from her. 9h. a.m., our hawser parted. 9.30, received a second hawser from her, and she took us in tow for Plymouth Sound.

5th.—3.15 a.m., brought up in Plymouth Sound.

Nov. 16th, lat. 50° 12′ N., long. 11° 15′ W. 17th, lat. 50° 4′ N., long. 13° 5′ W. 18th, lat. 49° 50′ N., long. 15° 55′ W. 19th, lat. 49° 38′ N., long. 17° 18′ W. 20th, lat. 49° 14′ N., long. 19° 21′ W. 21st, lat. 49° 45′ N., long. 19° 12′ W. 22nd, lat. 50° 50′ N., long.

18° 39′ W. 23rd, lat. 51° 43′ N., long. 19° 14′ W. 24th, lat. 52° 3′ N. 25th, lat. 52° 34′ N., long. 20° 48′ W. 26th, lat. 52° 26′ N., long. 20° 56′ W. 27th, lat. 52° 6′ N., long. 20° 40′ W. 28th, lat. 50° 51′ N., long. 18° 41′ W. 29th, lat. 51° 35′ N., long. 16° 57′ W. 30th, lat. 50° 45′ N., long. 14° 25′ W. Dec. 1st, lat. 50° 16′ N., long. 11° 54′ W. 2nd, lat. 50° 50′ N., long. 8° 17′ W. 3rd, lat. 49° 42′ N., long. 12° 56′ W. 4th, lat. 49° 40′ N., long. 5° 28′ W.

16th, easterly. 17th, E.S.E. 18th, E.S.E. 19th, variable. 20th, variable; p.m., southerly. 21st, E.S.E. 22nd, E.S.E. 23rd, E.S.E. 24th, E.S.E. 25th, S.E. 26th, East and variable. 27th, northerly; p.m., N.W. 28th, W.N.W. 29th, W.N.W. 30th, West. Dec, 1st, a.m., West; p.m., S.W. 2nd, a.m., S.W.; p.m., West. 3rd. S.W. 4th, West; p.m., N.W.

Names of those lost on the 16th of November.—Mr. Alfred Goodeve Paul, 27, chief officer, of Topsham; Alexander Mavor, Peter Johnson Cortes, Peter Johnson, Christopher Pollard, William Simpson, Edward Lyne, James Edwards, John Bruce, John Tipping, John Seyer, Carl Carlson.

Captain Charles Steel, 7th Lancers, commanding officer, rendered valuable assistance, day and night, throughout the gale, by personally maintaining discipline among the troops, principally young men, who were effective at the pumps, and performed all other duties required by Captain Flamank.

The following remarks appear in the *United Service Gazette* in reference to this subject, under the title of "A Nice Crew."

A finer exemplification of the present state of the mercantile marine of this country could not be presented than that afforded by the catastrophe which occurred recently on board the British troop ship *Bombay*. This vessel was chartered by the East India Company for the conveyance of troops to India. Had the Admiralty done the same thing we should never have heard the last of it. The transport department of the Admiralty would have insisted upon having the ship properly manned, as well as found; but the East India Company do not appear to have exercised any supervision of the sort. We learn from various sources that a considerable portion of the men comprised "Cephalonians, Italians, Spaniards, Dutch, Prussians, and Germans." This motley crew were as usual paralysed in the hour of danger. To get them aloft was found impossible, and only about sixteen British seamen remained staunch and efficient. These, headed by the chief officer, Mr. Paul, went aloft to furl the maintopsail. A heavy sea struck the ship, which caused her to lurch so heavily, that the main and mizen masts went over the side, carrying with them the gallant chief officer and his followers, only six of whom regained the ship. Fortunately the ship—one of the old teak tea-chests—remained sound, and although rolling fearfully and helplessly until some jury masts could be got up, reached Plymouth, in tow of the *Argus*.

We trust the lesson will not be lost on our legislators, and that it may induce a general revision of the transport system. It will be well also if for the future the lives of Her Majesty's subjects are held to be of more consequence, and if our British marine is replaced on a satisfactory footing, despite the shallow arguments of rabid free traders.

On the Hurricanes of the South Pacific Ocean.—No. III.

By Thomas Dobson, B.A., of the Royal Naval Schools, Greenwich Hospital.

The sources of information respecting the storms that prevail among the numerous tropical islands of the South Pacific Ocean, are extremely limited. The log-books of small sandal-wood vessels and whale ships are seldom kept with sufficient care to be useful, and merchant ships and vessels of war visit those waters only at long intervals. The journals of the missionaries must be the principal resource for meteorological information in those regions for many years to come.

The following notice of a storm of great interest is extracted from the M.S. journal of the Rev. W. Day, of Hobart Town, formerly at the missionary station of Sagnano, about six miles West of Apia, at Upolu, the principal island of the Navigator Group:—

"Before daylight of 15th December, 1842, the wind set in from the N.E. Some guests who were with us started at five o'clock, anxious to be at home, and had a dangerous ride. Before 10h. a.m. the natives, who are familiar from childhood with these hurricanes, were urgent with us to leave the house. We left it about ten, and took refuge in the village in a low hut, which they nearly buried in bread-fruit branches, to break the fury of the wind. Trees were falling around us in our way to the village, but we received no injury. Towards afternoon the storm abated, and rain fell in torrents. It became calm, and even fine, an hour or two before sunset. During the hurricane the wind came on in blasts, and got round from N.E. to S.E.b.S. Great devastation was done in the grounds around our dwelling. On surveying the fallen trees we found that they had been prostrated in very opposite directions."

"The storm raged extensively on the islands of Upolu and Savau, throwing down many of the largest native houses and chapels. An American whaler has been in since the storm. The captain states that they encountered it when about 200 miles distant, blowing from the West, at the same hour that it blew hardest here."

The Rev. W. Mills, at that time residing at Apia, informed me that the *American* whaler was to the North of Apia during the storm. Mr. Rabone, of the mission-house at Sydney, states that the storm extended to Vavau.

The shift of wind from N.E. to S.E.b.S. indicates a progressive motion to the E.½S., the track of the centre lying to the North of Upolu.

H.M.S. *Favorite*, bound from Tahiti to Sydney, met this storm on the following day near Mangaia, about 900 miles to the south-eastward of Upolu. The *Favorite* left Tahiti on the 11th December.

The following account is derived partly from an extract from the log of the *Favorite*, published in the *Nautical Magazine* for 1844, and partly from a narrative given in the *Voyage of the Beagle*, by Captain Stokes, who was at Sydney when the *Favorite* arrived there:—

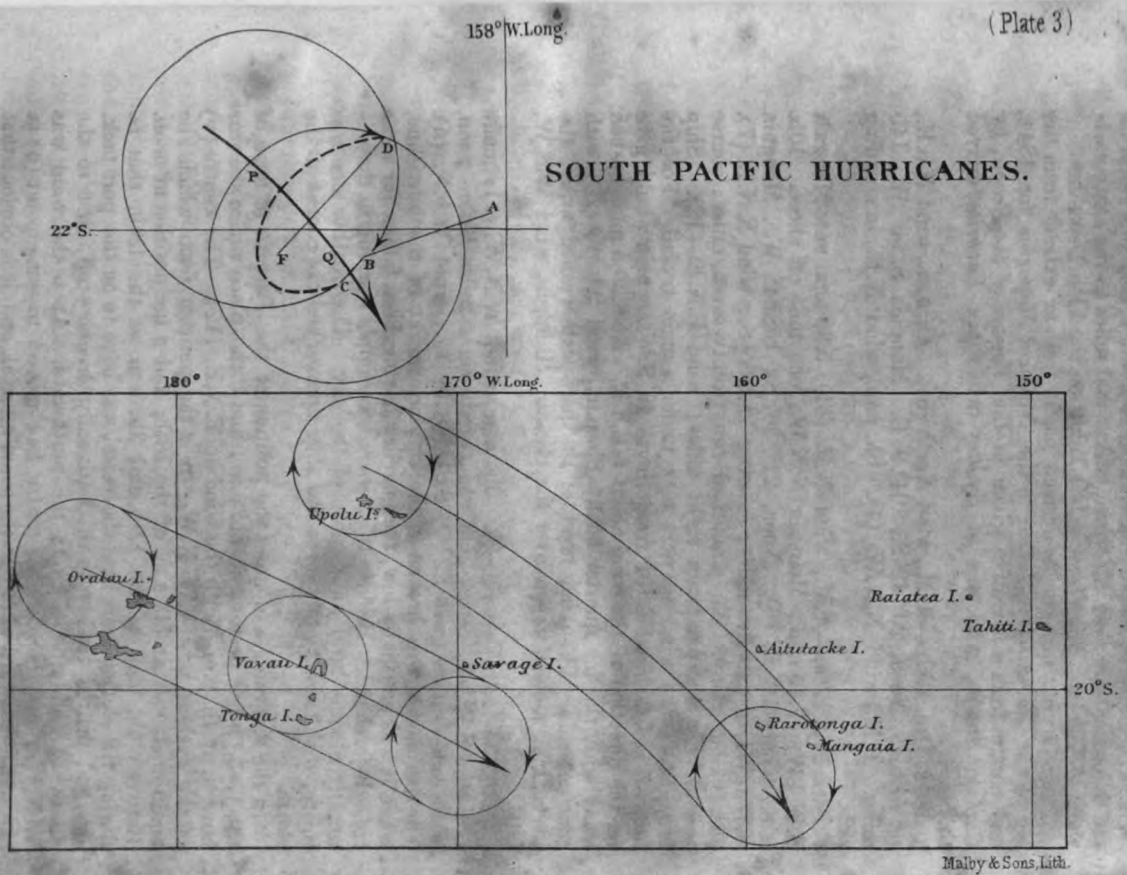
1842, Dec. 16th.—A.M., wind North (bc). 4h. a.m., wind N.b.E., set royals. Noon, 20° 42′ S., 204° 9′ E. Mangaia S. 59° W., 145 miles. P.M., wind N.N.W. (4). 8h. p.m., wind N.E., in studding sails.

Saturday, 17th.—A.M., wind N.E. (6). 5.30 a.m. saw Mangaia S.W.½W. 7.45 a.m., Mangaia N.N.W., one mile off shore. 10h. a.m., wind E.N.E. (6). Noon, 21° 58′ S., 158° 2′ W. Mangaia S.W.b.W., distant five miles; steering W.b.S.½S.; wind E.N.E. (7), cloudy and rainy. 3h. p.m., had run twenty-seven miles; course now S.W. 4h. p.m., ran eight miles; wind E.N.E. (12). Ship brought to the wind on port tack under a main trysail. For the hours 5 and 6 ship headed from South to S.W., which would give for the direction of the wind about S.E.b.E. At 6.30 a man washed away with the lee quarter boat. 8h. p.m., wind S.b.W. (12), with constant rain. 9h. p.m., most of the half-ports washed away, the sea making a clean sweep over the decks. Midnight, wind W.S.W. (10).

18th.—Wind West (10–8). 3h. a.m., wind W.N.W. (4); made sail on a S.W.b.S. course and ran twenty-eight miles before noon, when observation gave 22° 1′ S., 158° 44′ W.; wind W.b.N. (5). The barometer was broken in the commencement of the hurricane, when it was unusually low, the mercury having been falling for some time beforehand. Besides this, there was ample warning in the unusually gloomy lurid appearance of the sky. The weather also was misty, with showers of rain as the ship approached the course of the storm.

In the diagram, A denotes the position of the *Favorite* at noon of the 17th, B her position at 3h. p.m., and C the place where she was hove to at 4h. p.m., with the wind at E.N.E. (12). The centre (P) of the cyclone now bore N.W. D is the position from which she again made sail at 3h. a.m. of the 18th, and E her position at noon. Between 4h. p.m. of the 17th and 3h. a.m. of the 18th, that is, during the eleven hours that the vessel was hove to on the port tack, she had drifted from C to D, continually *breaking off*, first to the westward and afterwards to the northward. At D the wind was W.N.W.; and therefore the centre had moved to some point (Q) to the south-eastward of (P) in the same interval, and it is obvious that the vessel had been carried almost entirely round the advancing

SOUTH PACIFIC HURRICANES.



centre, and so experienced the successive winds N.E., East, S.E.b.E., S.b.W., W.S.W., West, and W.N.W., of which all but the last were of hurricane violence.

This is an excellent example of the combined effect of the wind and radial swell carrying a vessel when hove to, round the centre of a cyclone, and so causing the wind to veer continuously through more than half the points of the compass. It is probable that this cyclone was near the vertex of its path at Mangaia, and therefore that its centre was travelling more slowly than at Apia.

A violent storm travelled nearly along the same track as the preceding in 1846.

In the *Sydney Morning Herald* it is stated that "Upolu was visited by a hurricane on the 16th March, 1846. The vessels at anchor in the harbour (Apia) were H.M.S. *Juno*, the French missionary schooner *Clara*, and the Tahitian trader *Lucy*. Both the latter were driven high and dry on shore. The *Juno* with difficulty held her ground, with four anchors ahead. Fortunately the falling of the barometer indicated an approaching storm, and gave her time to lower her topmasts, etc., so that she rode out the gale without damage. On shore, houses were overturned, large trees torn up by the roots, and the crop of bread-fruit entirely destroyed. The island had not been visited by a similar calamity for seven years. It blew hardest from N.W. to N.N.W. The following American whalers touched at Upolu during the remainder of March. The *Ganges* had lost three boats, topmasts, &c., had her decks swept, and was twice on her beam-ends. The *Lalla Rookh* damaged her rudder and lost one boat. The *Mount Vernon* lost maintopmast and one boat. The *Eliza Adams* lost maintopgallantmast and three boats. The *Howqua* lost one boat. The *Timor* lost two boats. The *Crescent* lost foretopmast and two boats. The *Lexington*, rudder carried away. The *Newton* lost her jibboom and two boats."

Since Upolu suffered chiefly from the N.W. gale, it was in the northern portion of the annulus, and the central area lay to the southward of Samoa on the 16th. It seems then to have travelled rapidly towards the S.E., since we find it passing over Raratonga about 1h. a.m., and over Mangaia about 10h. a.m., of the 17th. For the following interesting facts I am indebted to the Rev. A. Buzzacott, of Raratonga, the friend and fellow-labourer of John Williams.

For some days previous to the great hurricane at Raratonga, the wind had blown strong from the East. On Monday, the 16th, there was a furious gale from the eastward. At 1h. a.m. of the 17th there was a dead calm, which lasted a few minutes, and then the wind shifted suddenly to the S.W. A vessel from Tahiti was driven by the rising sea over the palm trees; the captain told Mr. Buzzacott that he felt the tree tops grating against the bottom of the vessel. At Mangaia, forty miles S.E. of Raratonga, there was no barometer, but it blew strongest there, and the change of wind occurred at 10h. a.m. of the 17th. At Raratonga, the actual violence lasted from 9h. p.m. of the 16th to 3h. a.m. of the 17th, the storm passing away

more quickly than it came on. On board a vessel between Raratonga and Mangaia, the barometer was lowest at 5h. a.m.

The change from East to S.W. shows that the cyclone was gradually inclining towards the South, and approaching the vertex of its track. The fluctuations of the barometer at Raratonga on the 16th and 17th of March, are thus given in the *Samoan Reporter*.

16th.—Ten a.m., 29·50; 7h. p.m., 29·00; 10h. p.m., 28·50; 12h. p.m., 28·00.

17th.—One a.m., 27·70; 2h. a.m., 28·00; 4h. a.m., 29·00; 6h. a.m., 29·50.

In the course of the day it rose to 29·90, its usual height in fine weather.

This was a cyclone of great violence, as appears from the great depression of the mercury. It was also of small extent, for Captain Morgan informed me that he had visited the island of Aitutake soon afterwards, and found that the storm had not been felt there.

The following notices refer to a storm which seems to have travelled as nearly as possible due East from Tonga to Raratonga.

1839, Island of Lifuka, Tonga group, 19° 51′ S., 185° 38′ E. On Tuesday the 5th of February, the wind blew a strong breeze, which freshened during the night. On Wednesday, the 6th, it increased to a hurricane that obliged us to leave our dwelling-house, and take refuge in a smaller building. The hurricane was at its height about 4h. or 5h. p.m., and was from the West.

This notice I received at Sydney from the Rev. Dr. Lyth, Principal of the Wesleyan College at Auckland, and for many years a missionary among the islands of the Feejee Group. For the following I am indebted to the Rev. G. Charter, at that time stationed at Raiatea.

1839. Off Raratonga, 7th of February, a light wind sprung up from North.

8th.—Increasing from the same quarter.

9th.—Wind North, too strong to allow communication with the shore.

10th.—Wind increasing from the N.W.

11th, 12th, 13th.—Wind more to westward. Nothing set but a staysail; vessel had drifted ninety miles from the island, and as there was no prospect of a change, we stood for Tahiti, which we reached on the morning of the 17th. On the 16th we had light winds, but we afterwards found that the gale had lasted longer at Raratonga.

The easterly passage of the northern portion of a cyclone is clearly indicated here.

In the following case the cyclone travels to the E.N.E. from the Feejees to Tonga.

1848. Island of Ovalau, Feejee Group, 17° 42′ S., 178° 40′ E.

On Tuesday, the 4th of April, the wind blew fresh from North, and increased during the night. Towards the morning of Wednesday the 5th, it became a violent hurricane. On Tuesday, the barometer was 29·30; but, as the hurricane set in, the mercury fell an inch. When the storm was at its height, the wind had got round to the South.

Dr. Lyth, from whom I had the above, was shipwrecked in this hurricane at the island mentioned. The shift of wind from North to South shows that the centre of the cyclone passed over the island in an easterly direction, early in the morning of Wednesday the 5th of April. About noon of Thursday the 6th, the centre passed the meridian of Tonga, as appears from the following extract, procured at Sydney, from the log of the missionary brig *John Wesley*, Captain Buck, in which the approach, passage, and departure of the southern portion of the cyclone are distinctly recorded.

1848, 4th of April.—At Tonga. Light East wind and showery.

Wednesday, 5th.—Fresh from N.E., with heavy rain; towards noon the wind increased, and caused a swell. At 7h. p.m., the wind still freshening, and the weather looking very threatening, let go the best bower, and veered out 25 fathoms on each cable. Midnight, blowing very strong at N.E.

6th.—A strong gale at N.E., with a heavy sea; 7h. a.m., sent down royal yards and gave the ship more cable; 10h. a.m., wind increased to a hurricane, with very dark weather and torrents of rain; gave the ship 20 fathoms more cable. Noon, terrific gusts of wind from East to E.S.E., the sea wholly covered with foam. Veered out the cables to the last shackle, and housed the top-gallant-masts. From noon till 2h. p.m., the wind gradually veered to E.S.E. and moderated a little, but still blowing very hard; 3h. p.m., weather cleared a little, so that we could see the shore; 6h. p.m. moderated, and the rain ceased. Midnight, moderate and clear.

7th.—Wind S.E. At 3h. p.m. made sail and wayed from Nukualofu. At 5h. p.m. came to at Tangimoodo in 10 fathoms. Midnight, moderate and fine. The mission premises have sustained much damage from the hurricane of yesterday. The large chapel is wholly destroyed. The ship's cables were partially buried in the sheathing of the windlass, owing to the heavy strain caused by the wind and sea.

8th.—Wind S.E., moderate, and fine.

9th.—Strong S.E. wind, and cloudy.

10th.—Strong E.b.S. wind, a heavy swell from eastward.

11th.—Strong gale E.b.S. wind, squally.

12th.—Strong from E.N.E., and squally.

13th.—Strong E.S.E. gales, heavy squalls, with showers of rain, till evening.

14th.—A strong E.b.S., and heavy squalls.

15th.—A strong gale S.b.E., and heavy squalls. Noon, made sail for Lifuka. Evening, blowing very strong, and cloudy.

16th.—Moderate S.E. wind, and fine.

The hurricane here begins at N.E., veers to East and E.S.E., and ends at S.E. The southern margin of the cyclone, therefore, passed over Tonga, and was moving to the eastward.

On Saturday the 8th, the wind is S.E., moderate, and weather fine; but from the 12th to the 15th the *John Wesley* had strong gales,

veering from E.N.E. to E.S.E. and S.b.E., showing the passage of a second cyclone to the South eastward.

The following is an extract from the *Seaman's Friend*, a newspaper published at Oahu.

1848, April. The barque *Junius* for several days had strong gales from S.E. and East, and was compelled to lie to.

12th.—Two a.m., wind increased, in topsails; 3h. p.m. a sea struck and stove the larboard boat; 6h. p.m., fore-top-mast staysail torn in pieces. Blowing a perfect hurricane, with a heavy sea, lee rail under water.

13th.—Seven a.m., cut away fore and main top-gallant backstays, a sea carried away the boat; 9h. p.m., topmasts and jibboom gone; vessel nearly a complete wreck.

14th.—Wind and sea increasing. Barometer falling fast. Five p.m., the hurricane at its height. Barometer 27·70. Daybreak, if possible, the wind blew harder, the clouds looked blacker, and the rain fell faster, than on the previous evening. Through the day a slight rise of the barometer, about 0·30.

15th.—Daylight, wind and sea somewhat abated. Sunset, weather quite moderate, sea falling fast; made Savage Island ten miles distant (18° S., 169° W.) The hurricane commenced with wind at East or E.N.E., and veered round to the northward and westward, dying away to W.N.W. or West.

The *Junius* appears to have been in the southern margin of the first cyclone, having been compelled to lie to for several days before the 12th of April, by strong gales from S.E. and East; and on the 14th she had the eastern half of the second cyclone, whose course seems to have been more southerly than that of the first.

JAPAN.

Lord Elgin has returned to Shanghai after an absence of exactly one month. This short interval, however, has sufficed to enable him to conclude a treaty with Japan, which, if it does not equal in commercial importance the one recently signed at Tient-sin, is invested with even a higher character of historical interest and political significance.

On the 3rd of August H.M.S. *Furious*, *Retribution*, *Lee* (gunboat), and steam-yacht *Emperor*, destined as a present for his Majesty the Tycoon of Japan, entered the port of Nagasaki, and steaming past the point at which a line of junks have heretofore been moored to bar the ingress of foreign ships, cast anchor immediately off the city and Dutch factory of Decima. On the following day the *Calcutta*, having on board the Admiral, accompanied by the *Inflexible*, joined the squadron.

Nothing can exceed in picturesque beauty the bay of Nagasaki and the situation of the city at its extremity; swelling hills covered with the most luxuriant verdure rise from the water's edge. The steep thatched roofs of snug cottages peep from out the dense foliage amid which they are nestled; white temples perched upon overhanging points contrast brilliantly with their dark green setting. In some places precipitous walls of rock are mirrored in the azure blue of the water at their base; in others, drooping branches kiss its calm surface. Green batteries guard projecting points, and rock-cut-steps ascend the steep hill sides, clothed with heavy forest or terraced with rice fields. Boats of quaint construction, with sharp-pointed prows and broad sterns, above which flutter two black and white flags—the Imperial colours—glance across the harbour, propelled by stalwart naked figures, who scull to the tune of a measured chant. The fore part of the boat is covered by a roof, and contains a posse of two-sworded officials, who incontinently board each ship as it anchors, speak very fair Dutch, are extremely inquisitive, but very gentlemanlike and goodnatured, and who, after official curiosity has been satisfied, proceed to make their reports, and return, in all probability, to circumnavigate the ship as a guardboat during the rest of its stay in the harbour. A Dutch merchant ship and a Japanese man-of-war screw steamer were the only vessels in harbour when we arrived and anchored about half a mile from the shore.

The city of Nagasaki covers a plain at the end of the harbour, but it has outgrown its area, and the houses cluster up the spurs of the hills that sink into it, and the streets are in places so steep as to render steps necessary. Formerly foreigners were not allowed to enter the town, and the Dutch were only permitted to leave their prison of Decima under a strong escort of officials, and when permission had been formally asked and obtained. Now the barriers had been so far broken down that we explored at pleasure the shops and streets of the town—not, as in China, an offensive and disgusting operation, but a charming and agreeable amusement. The streets are broad, clean, and free from foul odours; the people civil and courteous, and if the shops in the town do not afford many interesting objects of speculation, the bazaars, which are stocked with lacquer, china, &c., for the express benefit of foreigners, are so tempting that few can leave them without experiencing a considerable drain upon their resources. Fortunately this was a temptation to which we were not exposed for any great length of time. Immediataly on the Admiral's arrival it became necessary to decide on the steps which should be taken for the presentation of the yacht. The distance of Nagasaki from the capital of the empire, and the comparative insignificance of the principal authority, rendered it very undesirable that so important an act should be performed there. As Mr. Ward, who commanded the yacht, had been instructed to deliver it over if possible at Jeddo, it was therefore determined that he should proceed at once to that place. Lord Elgin determined by accompanying the yacht to avail himself of the opportunity which would thus be presented of gaining

access to the capital, as by these means additional facilities would doubtless be afforded for carrying out the object he had in view.

No sooner was it decided that the presentation of the yacht should take place at Jeddo than the *Furious*, *Retribution*, *Lee*, and *Emperor* started for Simoda. Heavy gales obliged all four ships to run in for shelter at the bay of Nagasaki, and it was not until the morning of the 10th that they sighted the lofty volcanic mountain of Fusiyama. Towering like Etna to a perfect cone, with an elevation of about 11,000 feet above the level of the sea; it was first visible at a distance of upwards of one hundred miles, its beautiful outline defined sharp and clear, with the first gray tints of morning. This celebrated mountain, so dear to the Japanese, has been created by him into a household god. Fusiyama is painted at the bottom of the delicate china cup from which he sips his tea; it is represented on the lacquer bowl from which he eats his rice. He fans himself with Fusiyama—he hands things to you on Fusiyama. It is on the back of his looking-glass, it is embroidered on the skirts of his garments, and is the background of every Japanese work of art or imagination. Simoda is a lovely but dangerous harbour. Its apparently sheltered nooks and secluded coves woo you into their embraces, and when the South wind blows fiercely you are dashed to atoms upon their ribs of iron. The earthquake which wrecked the Russian frigate *Diana* changed the surface of the bottom, and there is now no good holding ground; but it is a fairy land to look upon, and in calm weather the picture of repose and security. Here, too, there is a Govoshi or Bazaar, and a better display of lacquer and china than at Nagasaki; but it is a town of no local importance, containing some 3,000 or 4,000 inhabitants; and when under the new treaty the port is shut up, will sink into its normal condition of a fishing village.

At the head of the bay the American flag flaunts proudly; for two years it has waved in solitary magnificence over the exiles who during that period have represented American interests in this remote corner of the globe. Cut off from all communion with their fellow men, and sacrificing in the interests of civilization and commerce the blessings of all social intercourse, their efforts had at last been crowned with success, and the Ambassador heard from Mr. Harris that he had only returned a few days from Jeddo, where he had concluded his treaty, and where Count Putiatine, who had proceeded to Japan direct from the gulf of Pecheli, was at that moment negotiating. The Dutch Resident at Nagasaki, Mr. Donker Curtius, had also been for some time engaged in negotiating at Jeddo, but had left before the intelligence had arrived there of the treaty of Tien-sin, and had consequently failed altogether in signing any treaty at all. He was at that time on his return journey overland to Nagasaki. Had any doubts existed as to the propriety of proceeding without delay to negotiate at Jeddo, they were at once solved by this intelligence, for it became incumbent on the Ambassador to lose no time in securing for Great Britain those advantages and privileges which other nations either had acquired or were acquiring, and in placing her, without

delay, in the position of the other European Powers at that time represented in Japan.

As, unfortunately, all the efforts made at Nakasaki to procure a Dutch interpreter had proved unavailing, an insuperable difficulty seemed to present itself on learning that the only language in which the Japanese covld communicate at Jeddo was Dutch. This obstacle was, however, removed by the friendly act of Mr. Harris, who, with great liberality and courtesy, placed his own interpreter, Mr. Huesken, at Lord Elgin's disposal. During the fortnight's stay of the squadron at Jeddo the services of this gentleman were in constant request, and his readiness to oblige rendered him universally popular, while in his official capacity his knowledge of the people and familiarity with their habits, acquired during a residence among them of two years, must have rendered him invaluable.

Simoda is about eighty miles from the city of Jeddo, situate at the extreme point of the promontory which forms one side of the capacious bay, or rather gulf, at the head of which the capital is placed. Up this bay the squadron proceeded. with a fair wind, on the morning of the 12th, and passing through the straits of Uraga, the left shore of which is feathered with rich verdure and indented with little bays, reached a point opposite the port of Kanagawa, beyond which no foreign ships had ever ventured, and where the Russian squadron could then be discerned at anchor.

Captain Osborn, however, professing his readiness to explore the unknown waters at the head of the bay, and to approach as near the city as possible, Lord Elgin seemed determined not to lose an opportunity of establishing a precedent likely to be so important in our future intercourse with Japan, and, to the astonishment of both Russians and Japanese, the British ships deliberately passed the sacred limit without communicating with the shore, and a few minutes after were cautiously feeling their way round a long spit of land which runs far out into the bay and offers some danger to the navigator. An instinct for deep water must have guided the ships along the channel, which was afterwards found to be sufficiently narrow and tortuous, but at last all doubts as to the feasibility of the enterprise were removed by the appearance of several large, square-rigged, Japanese vessels at anchor, the draught of water of which was a guarantee for our own. Behind these rose gradually out of the waters of the bay a line of insulated forts, which marked the defences of Jeddo, while an extensive suburb, running along the western shore, formed a continuous street as far as the eye could reach. The ships ultimately anchored in three fathoms of water, about a mile and a half from this suburb, and the same distance from the fine island forts abovementioned, which are situated on a sandbank, the intervening channels being always covered with water. About a mile beyond these forts and parallel to them, lay the main body of the city; the wooded height, on which is situated the castle of the Tycoon, forming a conspicuous object.

The arrival of the British squadron in waters which the Japanese

had sedulously represented as being too shallow to admit of the approach of large ships filled them with dismay and astonishment; boats followed each other, with officials of ascending degrees of rank to beg them to return to Kanagawa, and finally urgent representations were made to the Ambassador on the subject. The pleas generally put forth were amusing and characteristic;—first, it was said the anchorage was dangerous, but the presence of their own squadron was referred to as an evidence to the contrary; then that it would be impossible to procure and send off supplies, but it was protested that if necessary we could do without these. The merits and comforts of Kanagawa were expatiated on in vain; the paramount duty was the delivery of the yacht at Jeddo, and to deliver the yacht there it was necessary to remain at the present anchorage. No sooner was this settled than the Japanese in their usual way became perfectly reconciled to the arrangement, sent off supplies with great willingness, and began to prepare a residence on shore for Lord Elgin and his Staff. It appeared that Count Putiatine had been delayed for ten days negotiating on this subject at Kanagawa, and only succeeded in taking up his residence at Jeddo on the same day that we cast anchor before the town. He had made the journey overland from Kanagawa, a distance of eighteen miles.

The landing of a British Ambassador in state at the capital of the empire of Japan, was only in keeping with the act of unparalleled audacity which had already been committed in anchoring British ships within the sacred limits of its harbour. Japanese officials were sent off to superintend the operation, but they little expected to make the return voyage in one of her Majesty's gunboats, with thirteen ships' boats in tow, amid the thunder of salutes, the inspiriting strains of a naval band, and the flutter of hundreds of flags with which the ships were dressed. Close under the green batteries, threading its way amid hosts of huge masted broad sterned junks, the little *Lee*, surrounded by her gay flotilla, steamed steadily, and not until the water had shoaled to seven feet, and the Japanese had ceased to remonstrate or even to wonder, from sheer despair, did she drop anchor, and the procession of boats was formed, the four paddle-box-boats, each with a 24-pound howitzer in her bows, enclosing between them the Ambassador's barge, the remainder of the ships' boats, with captains and officers all in full dress, leading the way. The band struck up "God save the Queen" as Lord Elgin ascended the steps of the official landing place near the centre of the city, and was received and put into his chair by sundry two-sworded personages, the rest of the mission, together with some officers of the squadron, following on horseback. The crowd which for upwards of a mile lined the streets leading to the building fixed on as the residence of the Embassy, was dense in the extreme; the procession was preceded by policemen in harlequin costume, jingling huge iron rods of office, hung with heavy clanging rings, to warn the crowd away. Ropes were stretched across the cross streets, down which masses of the people rushed, attracted by the novel sight; while every few hundred yards

were gates partitioning off the different wards, which were severally closed immediately on the passing of the procession, thus hopelessly barring the further progress of the old crowd, who strained anxiously through the bars and envied the persons composing the rapidly-forming nucleus.

During Lord Elgin's stay of eight days on shore nearly all the officers of the squadron had an opportunity of paying him a visit. His residence was a portion of a temple situated on the outskirts of what was known as the Princes' Quarter—in other words, it was the Knightsbridge of Jeddo. In front of it was a street which continued for ten miles, as closely packed with houses and as densely crowded with people as it is from Hyde Park Corner to Mile End. At the back of it stretched a wide and somewhat dreary aristocratic quarter, containing the residences of 360 hereditary princes, each a petty sovereign in his own right, many of them with half a dozen town houses, and some of them able to accommodate in these same mansions 10,000 retainers. Passing through the spacious and silent (except where a party of English were traversing them) streets, we arrive at the outer moat of the castle; crossing it we are still in the Princes' Quarter, but are astounded as we reach its further limit at the scene which now bursts upon us—a magnificent moat, seventy or eighty yards broad, faced with a smooth green escarpment as many feet in height, above which runs a massive wall composed of stones Cyclopian in their dimensions. This is crowned, in its turn, by a lofty palisade. Towering above all, the spreading arms of giant cedars proudly display themselves, and denote that within the Imperial precincts the picturesque is not forgotten. From the highest point of the fortifications in rear of the castle a panoramic view is obtained of the vast city with its two million and a half inhabitants, and an area equal to, if not greater than, that of London. The castle alone is computed to be capable of containing 40,000 souls.

But the party on shore did not confine itself to exploring the city alone; excursions of ten miles into the country were made in two different directions, and but one opinion prevailed with respect to the extraordinary evidences of civilization which met the eye in every direction. Every cottage, temple, and tea-house was surrounded by gardens laid out with exquisite taste, and the most elaborate neatness was skilfully blended with grandeur of design. The natural features of the country were admirably taken advantage of, and a long ride was certain to be rewarded by a romantic scene, where a tea-house was picturesquely perched over a waterfall, or a temple reared its carved gables amid groves of ancient cedars. The tea-house is a national characteristic of Japan. The traveller, wearied with the noonday heat, need never be at a loss to find rest and refreshment; stretched upon the softest and cleanest of matting, imbibing the most delicately flavoured tea, inhaling through a short pipe the fragrant tobacco of Japan, he resigns himself to the ministrations of a bevy of fair damsels, who glide rapidly and noiselessly about, the most zealous and skilful of attendants.

In their personal cleanliness the Japanese present a marked contrast to the Chinese: no deformed objects meet the eye in the crowded streets; cutaneous diseases seem almost unknown. In Nagasaki towards evening a large portion of the male and female population might be seen innocently "tubbing" at the corners of the streets. In Jeddo they frequent large bathing establishments, the door of which is open to the passer-by, and presents a curious spectacle, more especially if the inmates of both sexes ingenuously rush to it to gaze at him as he rides blushingly past.

But it would not be possible to condense within the limits of a letter the experiences and observations of a residence in the capital of an empire about which the information at home is so very scanty, and which presents probably a greater variety of interesting and curious matter to the stranger than any other part of the world. Suffice it to be recorded as our general impression that, in its climate, its fertility, and its picturesque beauty, Japan is not equalled by any country on the face of the globe; while, as if to harmonize with its surpassing natural endowments, it is peopled by a race whose qualities are of the most amiable and winning description, and whose material prosperity has been so equalized as to insure happiness and contentment to all classes. We never saw two Japanese quarrel, and beggars have yet to be introduced with other luxuries of Western civilization.

It is not to be wondered at that a people rendered independent by the resources of their country and the frugality and absence of luxury which so strikingly characterize them should not have experienced any great desire to establish an intercourse with other nations, which, in all probability, would carry in its train greater evils than could be compensated for by its incidental advantages. Their exclusiveness has arisen, not, as in China, from an assumption of superiority over the rest of the world, but from a conviction that the wellbeing and happiness of the community would not be increased by the introduction of foreign tastes and luxuries; and that very propensity to imitate and adopt the appliances of civilization, so foreign to the Chinaman, is so strongly developed in Japan that their rulers foresee that the changes now being effected will, in all probability, some day or other revolutionize the country,—an apprehension which need cause the Emperor but little alarm. No one can doubt who has visited the two countries that the Chinaman will still be navigating the canals of his country in the crazy old junks of his ancestors when the Japanese is skimming along his rivers in high-pressure steamers, or flying across the country behind a locomotive.

We have yet to discover what the exports of Japan may be beyond camphor, wax, and copper; but, from a consideration of the natural tendencies and "go ahead" disposition of the people, there can be little doubt that a market will at some future day exist in these islands for the produce and manufactures of the West of sufficient magnitude and importance to secure for them a high place in the list of Great Britain's customers.—*The Times.*

The Japanese are fine fellows, and altogether a superior race to the Chinese. They are strictly honourable in all their dealings, and possess all those essential qualities which make men honest, generous, and brave. We were but a week there, and were most courteously treated the whole time,—cutting about everywhere, both in the town (Nagasaki) and the country. The country was most beautiful and picturesque, and cultivated with the most elaborate care even to the highest peaks of the hills. The harbour of Nagasaki is one of the most magnificent in the world: rocks, waving woods, and undulating surface were the leading features of the scene, and enclose the harbour. Rich fields and pretty little villages peering through the trees are seen on all sides, while at the head of this magnificent sheet of water, embosomed in trees and reflected in nature's brightest mirror, lies the town of Nagasaki. Of it I cannot say that there was much worth notice; architectural embellishments the Japanese have none; no fluted columns or lofty façades, no tapering spires or gorgeous porticoes attract the attention or arrest the step of the passing stranger.

But if there was nothing remarkable in the embellishments of the city, one could not help noticing the decorous appearance of the inhabitants, their civility, attention, and politeness, and, above all, their industrious habits and strict integrity. We bought lots of things of all sorts, and everything remarkably cheap. Their earthenware is of the most beautiful description; the Chinese have nothing like it; their lacker ware is unequalled, and all the other productions of the Japanese seem equally good. Had I possessed a small trading capital, I could have invested it with equal pleasure and profit. Things that were bought for a shilling at Nagasaki fetched a dollar at Hong Kong, and these merely because of their superiority to articles of similar description of Chinese manufacture, which you are aware are in many respects very beautiful and curious. You will have an opportunity of judging for yourself of the lacker ware, of which I send you a very beautiful specimen in the shape of a table, and I reserve other objects I have selected for you until my return. Some of the silk, crape, and satin embroideries were most gorgeous.

The Japanese are highly civilised and fully alive to the superiority of Europeans in science. They have already made themselves masters of steam, and understand the electric telegraph. In Jeddo, where they had never seen an European ship, they had built vessels from European plans, and although the workmanship was exquisite, the vessels themselves when constructed were, as you may imagine, rather curious than useful.

The town of Nagasaki contained upwards of 70,000 inhabitants, but the streets were so quiet and so few people were to be seen moving about that you might have supposed there was not a tithe of that number; but one corroborative fact that in my opinion proves the extent of the population is the number of tea-gardens in the vicinity; of which, according to the most moderate computation, there cannot be less than 700. All these gardens are laid out in the most tasteful

manner, half garden and half wilderness. Within doors, the house is divided into a number of small rooms, scrupulously well kept with clean mats, but with very little other furniture.

A principal attraction of these gardens, however, consists doubtless in the troops of "neat-handed Phyllisses" that attend upon them. After taking off your shoes you go upstairs and recline on the softest of all conceivable mats, and presently in comes a most delicious repast, composed of all sorts of Japanese luxuries, of which commend me, before all the rest, to a Japanese salad. The genius of Alexis Soyer never conceived aught to equal this luxury. But as the best of feasts would be insipid without female society, numbers of fair girls lend their presence to the scene, help you to the daintiest morsels with the most delicate attention, and when you throw yourself back to enjoy your "weed," they call for their instruments, and with lute, harp, and gittern, lull you to the land of dreams with the softest and most plaintive music I ever heard. "Think of that, Master Brook!"

All these girls are intelligent, well dressed, and graceful in the extreme, and as such are held in high estimation by the Japanese, who have no qualms or squeamishness about bringing their families into their gardens to take lessons in "deportment" from the attendant houris I have mentioned; whose "frailties" do by no means interfere with their subsequent fortunes, since they marry and are given in marriage without scruple or discredit. All the married women blacken their teeth and cut off their eyebrows, which makes them look hideous. On the whole, I need not tell you that we were very sorry to leave Japan.

H.M.S. ——, Hong Kong, Oct. 15th.

The Shipping Interest.

At the recent meeting in London the following address to the Queen was drawn up from the resolutions:—

The Loyal and Dutiful Address of the Undersigned Owners of British Ships, and Others Interested in the Prosperity of British Navigation.

May it Please your Majesty,

Animated by the most profound sentiments of loyalty, and the most devoted feelings of personal respect and attachment to your Majesty, we approach the Throne humbly to represent to your Majesty the ruinous state of depression into which the British Shipping Interest is plunged; and to implore that your Majesty will be pleased to extend to that important National Interest such assistance and relief as your Majesty is enabled by Statute to afford to it, through the exercise of those powers which were vested by law in the Crown, for the express

purpose of meeting the case, which we deeply regret we have now to submit to your Majesty's gracious consideration.

In the year 1850, by the repeal of the Navigation Laws, the ships of all foreign nations were admitted without restriction into every branch of the British Carrying Trade, except the Coasting Trade; and in 1854, that exception being also removed, the British Shipowner has from that time been exposed to all the severity of unequal competition with the Shipping of every foreign State.

We refrain from troubling your Majesty by any recapitulation of the urgent representations addressed to Parliament, at the periods referred to, of the evils and perils anticipated from a policy which was believed by Shipowners generally to be fraught with danger to the supremacy of British Navigation and to the natural defences of the British Empire. We believe that our apprehensions have been in great measure justified by the result. We know that the difficulties and losses of the British Shipowner have been partly caused and greatly aggravated by the measures alluded to. But we are at the same time fully aware that, if there be reason to complain of the present state of the law, it is to the Legislature, and not to your Majesty, that our remonstrances should be addressed.

We are induced, however, now to trouble your Majesty, because it is not an alteration of the law we at present seek, but its due execution as it actually exists. When it was proposed to Parliament, in 1849, to abrogate entirely every exclusive privilege conferred by ancient Statutes on British Shipping, a confident expectation was held out by authors of this mighty change, that the liberal example thus set by Great Britain would be promptly followed by all foreign nations, since all were thereby freely admitted to equal participation in the benefits of her vast Maritime Commerce. Yet even while indulging this sanguine hope, they anticipated the possibility of their expectations not being realised, and of Foreign States refusing to reciprocate, even to the limited extent possible to any of them, the large and liberal concessions made to the Navigation of all. To meet this contingency they introduced into the Act of Repeal, and subsequently incorporated into the Act 16 and 17 Victoria, cap. 107, the following clause:—

"If it shall be made to appear to her Majesty that British vessels are subject in any foreign country to any prohibitions or restrictions, as to the voyages in which they may engage or as to the articles which they may import into, or export from, such country, it shall be lawful for her Majesty (if she think fit), by Order in Council, to impose such prohibitions or restrictions upon the ships of such foreign country, either as to the voyages in which they may engage, or as to the articles which they may import into, or export from, any part of the United Kingdom, or of any British possession in any part of the world, as her Majesty may think fit, so as to place the ships of such country on as nearly as possible the same footing in British Ports as that on which British ships are placed in the Ports of such country."

We have now to represent to your Majesty that, after the expe-

rience of several years, it is found that the universal admission of Foreign ships to all the privileges of British ships has not induced the Governments of many Foreign States to admit British Shipping to equality of privileges with their own ships; but that British navigation is in many cases impeded by prohibitions, restrictions, and regulations totally at variance with the Reciprocity contemplated when the British Navigation Laws were repealed, and which seriously aggravate to the British Shipowner the difficulties against which he is doomed to struggle, in the unlimited and universal competition to which he is exposed.

Under these circumstances the British Shipping Interest has no resource but in an appeal to your Majesty; and on behalf of that Interest, we are accordingly deputed respectfully, but earnestly, to implore your Majesty to exercise the powers vested in the Crown by the Act of Parliament we have referred to, and that your Majesty will issue accordingly an Order in Council, placing the ships of non-reciprocating countries "on as nearly as possible the same footing in British Ports as that on which British ships are placed in the Ports of such Countries."

In urgently soliciting your Majesty to adopt this course, we emphatically protest against any attempt to connect our application with any consideration of disputed systems of general Commercial policy. The relief we could hope from your Majesty's gracious acquiescence would, we are too well aware, be but scanty and insufficient. But the impartial administration of the laws is an act of simple justice which it is natural we should claim; and we venture, therefore, respectfully to submit to your Majesty that longer to withhold from an important, an aggrieved, and a suffering Interest, the alleviation, however slight, which the law has provided, would be an aggravation of what that Interest has always regarded as an undeserved and impolitic injury. It is satisfactory to us that, if we should resolve to seek further redress, it will be to the Legislature we shall have to urge our claims, and that we shall not have occasion again to intrude, as we now do with great reluctance, personally on your Majesty. But, meantime, Parliament having been pleased to vest in your Majesty exclusively the power to afford the measure of relief we seek, we appeal with confidence to a Sovereign, among whose strongest claims to the attachment of a loyal and devoted people will ever be recognised her uniform anxiety to dispense impartial justice, to redress proved wrong, and graciously to listen with readiness and attention to every reasonable remonstrance of her injured or suffering subjects.

Entreating, therefore, that your Majesty will graciously assent to this our petition, and earnestly praying that it may please Almighty God long to preserve your Majesty to reign in health and happiness over a loyal, a prosperous, and a contented people,

We are your Majesty's faithful and devoted subjects.

Nautical Notices.

Particulars of Lights Recently Established.

(Continued from vol. xxvii, p. 684.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
78. Stamsound	Tornholm, S. Point, 68° 7 3′ N., 13° 53′ E.	Lofoten Isl., Norway	..	58	7	Est. 1st Jan., '59.
Fredericksvarn	Stavarnso, S. Point	.....	..	..	..	Est. 1st Dec., '58. Coloured Green.
79. Copenhagen	Tre Kroner	.....	Ff.	41	8	Est. 15th Dec., '58. Glare of eight secs. duration every three minutes.
81. Shoalwater Bay	Toke Point, 46°44·2′N., 124°2·4′W.	Washington	F.	90	15	Est. 1st Oct., '58.
Smith Island	Juan de Fuca Sd, 48°19·2′ N., 122° 50·8′ W.	N.W. America	R.	93	16	Est. 18th Oct., '58.
82. Rudha Mhail	N. extreme Islay, 55°56·1′N., 6° 7·5′ W.	Islay, Hebrides	F.	147	15	Est. 1st Jan., '59. Between N.b.W.½W. and N.N.E.½E. from the Light it will be *red.* *(a.)*
83. Favignana I.	S.E. Point, 37°55·8′N., 12° 21′ E.	Sicily, West Coast	F.	61	10	Est. 1st Jan., '59. Green Light.
84. Bacalhao I.	North Point	Newfndland, E. Coast	R.	380	30	Est. 20th Dec., '58. Interval twenty seconds. When South end of island bears N.N.E. less than eight miles off the light will not be visible.

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

(a)—Directions.—Mariners are to observe that the white light when seen in any direction from the westward is to be regarded as a warning light, and is not intended to encourage an attempt to pass between Islay and Oronsay, but to indicate their position so as to enable them to keep an offing. The red light, which will show in the direction of Oronsay and Colonsay, will indicate to vessels their approach to those islands when navigating the Sound of Islay to the northward. The white light when seen in any direction from the eastward will be a leading light for the Sound.

* No. 80 will appear in our next number.

Rhudha Mhail Light,—*North End of Islay Sound.*

In our last volume we made some observations on the arrangements of this light, and we expressed surprise at a portion of the island of Oronsay being excluded from the *red light* (that of danger) and included in the white light, considered by the generality of seamen to be that of safety. It is with much regret that we perceive this extraordinary mode of proceeding persisted in for protecting ships that may make use of this light from the greater part of a danger and yet

not including the whole of it! There is a distance, nearly amounting to *two miles*, of unnavigable space westward of the bearing (N.b.W.$\frac{3}{4}$W.) given as the line limiting the red light, sufficient to cause wreck and ruin. And why is that limit to be fixed to that bearing, as if on purpose to allow ships to run on shore; when for their protection the red light might have included a point and a half more to the westward, or even to N.W.$\frac{1}{2}$N. If a danger is to be indicated by a red light (as appears to be acknowledged here) why, we should like to know, is not the whole of that danger to be included? Why are nearly two miles of it thus left as unworthy of attention? most dangerous ones too, and which may some day be fatal to mariners. But they are told by the notice to consider the bright light, when seen from the westward, as a "warning light," and not as encouraging an attempt to pass between Islay and Oronsay;—to consider it as merely "to indicate their position so as to enable them to keep an offing." What a boon to the mariner to entice him with a light for the purpose of showing him his position, with which he is "*to keep an offing*," when to see that light in even moderately bad weather—when it is most wanted—he may be so near to it as to be unable to regain that offing! It is admitted here that no vessel is to pass between Oronsay and Islay. Then, we ask, why entice them there with a bright light?—why not, indeed, extend the red light over the whole of this objectionable and dangerous channel, as it is thus acknowledged to be, as already done over Colonsay?—or why not include the whole of Colonsay and its off-lying dangers in the red light now over only a part of Oronsay?

The whole arrangement, as at present, appears most objectionable and highly dangerous; and, loth as we are to do so, yet we contribute our assistance to apprise mariners, in compliance with the notice to which we allude, that the RHUDHA MHAIL LIGHT, at the North end of Islay Sound, when seen from the northward, may be approached;—that the red light which it throws over Colonsay and Oronsay does not include half the dangers of the latter island;—and that when seen from the westward it is to "*enable*" vessels "*to keep an offing*,"—we may also add, if they can do so after having lost it! How they will use *the light to enable* them to "keep an offing" when they once find themselves between Oronsay and Islay, even at some seven or eight miles' distance, with a stiff northerly gale, we have a painful interest yet to learn. But at all events they must understand that the RHUDHA MHAIL LIGHT may be run for from the North-East, but not from the westward, although it presents the same appearance both ways;—that it is calculated, even by the notice, to entice a ship for the satisfactory purpose of showing her her position!—and that although its red light indicates an unnavigable district, its bright light includes one that is both navigable and unnavigable!

That this most injudicious arrangement of the light will be allowed to remain long we cannot believe, although perhaps it may until some wreck occurs in consequence! It is very well known that lights have been placed where wrecks have happened in order to prevent them, as

they have done. In such cases first the wreck comes and then the light. But things seem in a fair way here to be reversed—for it is first the light, and then the anticipated wreck to produce the alteration, unless the committee just appointed to look into these matters save us from this disgrace.

PORTLAND BREAKWATER,—*Refuge Harbour.*

This important structure presents advantages to ships that must not be lost sight of on account of interested pilots. The following extract of a letter from an experienced naval officer, shows the kind of game these men are at, whose interest it is *not* to take ships into the harbour already formed by the breakwater.

"I went to the breakwater at Portland, and was much pleased to observe the progress that had been made in the stone-work particularly, the entire length now reaching nearly a mile and a quarter. The curve of the breakwater now forms a safe shelter for any vessels requiring it. Many vessels during the late breezy weather have come off the Roads and made a signal for a pilot when none was required: and there are but *three* pilots—of one family, who do not think alike, so that masters of vessels, ignorant of all the facts, are sadly distressed to know what to do."

The following extract of a letter from the engineer, Mr. Coode, throws some further information on the subject.

The Breakwater is now about a mile and a quarter from the shore. There is now sheltered anchorage during the S.E. gales to the extent of nearly 1,200 acres, with upwards of 3 fathoms in depth; of this area at least 900 acres will have upwards of 5 fathoms in depth. The holding ground is of the very best description, being all blue clay. No dues or tolls of any kind are levied on the use of the harbour. It has been stated more than once that pilots belonging to other places have dissuaded masters of vessels, who do not know the new harbour, from running for it. Masters should therefore be on their guard against any statement made by *pilots from other ports.* All those masters who have come in for the first time express their unqualified admiration as to capacity, perfect shelter, &c.

Thus masters of vessels will see how they have been imposed on—no pilots being really required. The stone pier from the elbow lies nearly N.N.E. by compass, and all they have to do is to run round the vessel with a *red light* moored at the termination of the part where the work is going on, and take up their anchorage either by day or night as convenient. And they may thus lie snug at anchor instead of undergoing all the discomfort of keeping at sea in bad weather with a foul gale, or of being taken by an interested pilot where they have no wish to go.

Blasting the Vanguard Rock.

In July last a careful survey on a large scale was made of the rock and the adjoining channel. A diver was subsequently sent down on the highest part, with instructions to search for a hollow or saddle in which the charges of powder intended to be exploded could be placed. This he reported to have found on the West side of the peak, and to be about four feet in depth. His report was confirmed by the soundings.

On October 20th, at high water, Captain Jerningham of H.M.S. *Cambridge*, directed the placing and exploding of a breaker containing 88 lbs. of powder, on the abovenamed spot, the depth of water over the charge being 37 feet. On the following day, at low water, a cask containing 350 lbs. was exploded on the same spot, the depth of water over it being 25 feet.

The first explosion threw up a cone of water estimated at twenty feet high, and produced a smart shock on the Point, distant 800 feet. The second threw up a column of water estimated at from thirty to forty feet, and also produced a sensible shock on the Point, but of much less force than on the preceding day.

These trials were, I believe made by Captain Jerningham with a double object. First, to test the means of explosion he intended to employ for the large cyclinder; and secondly, that if these charges succeeded in removing any considerable portion of the rock, a bed would be formed in the centre for the insertion of the cylinder, the explosion of which it was then hoped would entirely shatter the remainder.

On October 22nd several lines of soundings were taken; these clearly showed that no alteration had been effected.

Two divers were also sent down at various times to examine and report on the effect produced. I regret to state their accounts were most conflicting. One, a man sent from H.M.S. *Excellent*, for the purpose of these experiments, stating that large masses of rock had been torn off, and that the rock altogether was much rent. The other, a diver from the Dockyard, Devonport, reporting that where the powder was actually placed, small pieces of rock had been removed, but that the mass was undisturbed.

On November 5th, at high water, a cylinder containing 21 cwt. of powder was exploded on the same place as the former charges, the depth of water over it being 38 feet. On this occasion a circular plateau of water was raised above the surface, from the centre of which rose a large cone to about the height of sixty feet.

The divers again examined the rock, and their reports were similar to those they first made, and were as conflicting as before.

A succession of easterly gales prevented a second survey being made until November 19th, when soundings were taken. These agreeing so closely with the first examination, I have not considered it necessary to pursue the investigation further; but I may

remark, they confirm the statements of the Dockyard diver, viz., that where the ends and sides of the cases containing the powder rested, pieces of rock, a few hundred weights each, were blown off; but that twenty feet from the spot, and on the highest part of the rock, not even the weed was disturbed.

Dimensions of the Vanguard Rock on its East, South, and West sides; it rises 48 feet on a base of 600 feet. On the North or inshore side it rises 10 feet on a base of 80 feet. At a depth of 24 feet, its length is 180 feet, breadth 80 feet. The highest point rising 6 feet above this, being 70 feet from the West end and 25 from the North side.

[That this great explosion has produced no effect on the Vanguard Rock may be accounted for in the circumstance of the iron cylinders forming an effectual *shield* for the surface against the immediate operations of the powder. The experiment does not yet appear to have had a fair trial, the effect being to be looked for from small repeated discharges of powder in a mass on the surface, secured from the water in anything that will keep it dry. We have already seen their effect on the Pot Rock at New York and the Rose Rock at Brest, in our last number, and we have just met with the following account of the same operation at the Sandwich Islands in a Honolulu paper.

Last Tuesday morning a twenty-five pound keg of powder was exploded on the rock at the West corner of the Market Wharf. The rock, which was some 13 feet under water, has been a hindrance to full ships lying there, and its removal was desirable in order to build the wharf further out, which is now being done. A tin can, containing twenty-five pounds of powder, was placed on the top of the rock, connecting with a scow by a lead pipe, in which was the fuse. This was fired, and the crowd withdrew to a convenient distance. The match was about four minutes in burning before it communicated with the powder, when a sudden jar was perceptible to those who stood on the wharf, and in a second, a dull heavy report was heard, and the water rose up over the rock to the height of some eight or ten feet, in shape like a huge mushroom. After the mud had subsided and the water became clear, a native diver was sent down and reported that there was a *puka nui* on the bottom. The rock was pretty nearly demolished, and the depth of water increased six feet.]

Sayings and Doings.

The intelligence comes to us from Baltimore that a Mr. Winans has constructed and launched an iron vessel which can be propelled at the rate of *thirty miles an hour!* She is formed of two cones, united at their base, which is the centre of the ship, and the two ends are perfect points of solid iron.

Her shape in short is like a cigar, but both ends pointed instead of one. If she will float, and can be moved with this velocity, and be accurately steered, which seems a very doubtful matter, such vessels will entirely alter naval warfare, and render all our present outlay for men-of-war of no use. Her bow will be a punch or ram of many hundred tons, impelled at a velocity approximating to that of a cannon-ball. If she cannot be used as an implement of war, yet for transmitting mails, passengers, and objects of great value, which will bear a high freight, she will be far superior, according to Mr. Winan's statement, to all vessels previously constructed. Of the possibility even of success we give no opinion; we only mention the invention following the building of the *Great Eastern*, and following the successive improvements lately made in constructing paddle and screw steamers and sailing vessels, as an illustration of the fact that at present the attention of clever men is very much directed to inventions for improving navigation, facilitating communition by sea, cheapening carriage, and rendering war like all other matters of business—*short and to the purpose.*

A very remarkable feature of the climate of Honolulu, is the effect of the trade wind and its opposite the sea breeze. As soon as the former suspends its breath, all Honolulu, but more especially the older residents, at once begin to feel its absence, in the shape of colds, coughs, asthma, and general lassitude. But let "the trades come down," and everybody at once feels well.

A superb and valuable souvenir commemorative of the fame earned by the ship, in the shape of a memorial table, has been made of the original timbers of the brave old *Victory* by the joiners of Portsmouth Dockyard. No wood has been employed but that which was in the ship at the Battle of Trafalgar. The table is eighteen feet long, ten feet wide, and three feet one inch high, supported on six massive, handsomely turned legs. It is destined as a present to the United Service Museum in Great Scotland Yard. All the models of the ships engaged in the ever-memorable action are placed upon the table, which is panel-topped, and fastened by screws or screwbolts, made also of copper which was in the ship in the height of her glory. The table has been forwarded to its destination.

The Committee of the Shipwreck and Humane Society held their monthly meeting at the Underwriters' Committee Rooms, Liverpool, when Captain Schomberg, her Majesty's Emigration Officer at that port, brought under notice the exemplary and courageous conduct of Captain H. D. Johnson, late Master of the ship *Eastern City*, on the occasion of that vessel being destroyed by fire in August last, in lat. 31° S., long. 32° W., the particulars of which have been for some time before the public. The Committee unanimously voted Captain Johnson the Society's gold medal, the highest mark of distinction they can give for meritorious conduct. The following was the inscription on the medal:—"Presented to Captain H. D. Johnson, for his cool and intrepid conduct in saving the passengers and crew, 224 souls, of the ship *Eastern City*, destroyed by fire in lat 31° S., long. 32° W." The medal was presented by the Chairman, Samuel Martin, Esq., to Captain Johnson in the Underwriters' room.—[See account of this in our December number.]

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

FEBRUARY, 1859.

The Convent of La Rabida,—*An Historical Picture.—By M. G. de la Landelle.*

On a promontory which serves as a landmark for mariners, about half a league from the hamlet of Palos, in Andalusia, stands the convent of La Rabida. In these days it is no more than a solitary ruin, without having preserved even the signs of its antiquity, for it has frequently been clumsily repaired with no respect for its Gothic architecture. The latest of these repairs is in a bad condition, and the whole is bedizened with paint, according to the custom of the country, in a manner which destroys all harmony.

If, peradventure, a tourist should wander up the sandy footpath which leads to this humble monastery he does not consider it worth looking at. Such tourists are mostly ignorant men. They do but half examine those places before leaving them which they have come on purpose to explore. They are compelled to put up with a guide of eighteen or a chattering cicerone, on whose information they are obliged to depend or else they see nothing. Their enthusiasm is at the discretion of the first of these creatures to be had; they care very little about clearing up a doubt, of ferreting out a fact; they come home as they set out, with their original prejudices as fresh as ever, and only confirmed by some absurd story. They should only be depended on for information on the subject of hotels on the route.

At Palos there are plenty of taverns for muleteers, but without either bedchamber or bed, so that the traveller is relieved from certain suspicions. Here travellers who delight in comfort are not

found venting their rude remarks. There is no vineyard or pinery by the way side of the approaches to the convent of La Rabida. Disdainfully neglected, no one passes before this memorable place except some old seaman or erudite monk, or, may be, the village doctor, to contemplate on the glorious project which changed the destinies of the world. If the foundation of the monastery dates back to times previous to the conquest of Spain by the Moors, the legend to which it is said to owe its name is about the time of their expulsion from the banks of the river Tinto. They had been forced beyond the Guadalete in the kingdom of Grenada. Christianity had been reestablished, and convents were again filled every where, when a fearful epidemic desolated the country about Palos. Animals suffered as well as mankind, and all was terror and consternation.

At this period a miraculous image of the Virgin was found, a pious vestige remaining concealed in the ground during the whole time that the Moors had occupied the country. It was carried in procession about the country, the disorder ceased, and, thanks to the powerful protection of the Queen of Heaven, it never reappeared! The holy image is preserved in the convent, which has since been consecrated to Our Lady of La Rabia, or, in old Spanish, La Rabida that is.

"Twice every year," says Washington Irving, "on the festival days of the convent, the silent solitude of the convent is broken by the arrival of an immense multitude of the people of Moguer and Huelva and the neighbouring country. The esplanade in front of the building is like a fair, and the image of Our Lady of La Rabida is solemnly paraded."

When, in 1828, this celebrated historian visited this monastery, two of its fraternity, a novitiate and brother layman, formed its whole community, which no doubt remains much in the same condition, unless the late revolutions in Spain have banished them from their retreat. But the narration we have in hand will take us very much further back.

The little village of Palos was then in a flourishing condition. The Tinto, scarcely a quarter of a mile distant, flowed along its skirts: a hardy race of boatmen and pilots dwelt there, and its commerce was prosperous. No Spanish port was more connected with the recently discovered African Islands than Palos. The convent of La Rabida was in a condition no less prosperous. The prior of it, Juan Perez de Marchena, had been the Queen's confessor, and that he enjoyed a high opinion at court was as well known as his excellent virtues and his profound learning.

Juan Perez was one of those religious savans of which the cloisters of those days could boast in abundance. His intelligence was only surpassed by his warm and generous heart rich with the evangelical principle. He lived at this retreat to practise charity and to display the example of humility united with science.

Many years after he had been the superior of the Franciscan convent of La Rabida, one melting day in September, 1485, a traveller

arrived at the door, poorly clad, and evidently well advanced in years, although his age it might not be easy to say. He was leading by the hand a youth about ten or twelve years old, whose pallid face and worn out appearance showed that he was suffering from hunger, thirst, and fatigue. "Brother," he said, addressing the porter at the gate, "for the love of heaven bestow a morsel of bread and a little water on my poor child."

Saying this, the stranger placed his son on one of the steps of the door and seated himself by his side, his eyes fixed above. Then, as if oppressed with grief, he dropped his head between his hands and knees and remained silent and motionless, absorbed in thought. The monk, however, caressed the boy with kind and comforting words, giving him bread, asking him some questions about where he came from, the object of the journey, and why he had become so weak from fatigue.

"We come from afar," replied the child. "We left the banks of the Odiel at daylight." he added. "We are going to Huelva, to our friend's house, where we expect to find an asylum."

"But," asked the friar, "where is your country?"

"My country! I was born at Porto Santo, one of the islands of the ocean. My uncle was the governor of it, but neither he nor my father is either a Portuguese or a Spaniard."

On hearing this, the stranger, slowly looking up, said,—"That will do, Diego, that will do. What matters it to this good monk to know the history of two unfortunates seeking charity? God will repay you, brother," he continued, "and will send blessings on your convent," and then he got up to continue his journey, but his unfortunate child was too tired to leave his seat of stone.

At this moment the prior, Juan Perez de Marchena, arrived.

The poor stranger not only wanted alms, but also comfort and encouragement to support his trials, and the holy man perceived it and approached him as his son was sitting in the shade of the porch. The physiognomy and the attitude of the stranger formed a curious contrast with his ragged, grotesque dress, covered with dust; and his manner, which was evidently that of a person accustomed to command, revealed a strength of purpose superior to the generality of men. Notwithstanding his hair was not entirely white, his visage deeply furrowed, and his cheek bones high, he was not bent by age, and was still strong and robust, and his clear grey eye sparkled with animation.

"Patience, brother," said the prior, "if your little companion is too weak to continue your journey, come in and pass the night in our convent, we shall be happy in the care of you."

"Thanks to your reverence," replied the stranger, "the end of our journey is not far off."

"I perceive by your accent," said the monk, "that you are no Spaniard, but do not apprehend any unpleasant questions. If the story of your sorrows will lighten their burthen it will be listened to

with sympathy, and should you desire to conceal your name and country you will still be welcome in our abode."

After a momentary silence, the traveller replied,—"The Almighty has directed my steps through the path of adversity even until now. I have come as a mendicant to the gate of your monastery, and I felt severely the shame of doing so. I confess that the feelings of pride overcame me and I now abjure them. Your kind words have awakened me to my condition, and you have invited me to repose my confidence in you. Be it so. Poor though I am, I shall not blush at my poverty; my actions are beyond reproach, why should I conceal them from you. If my convictions proceed from God, if his will has really selected me to accomplish a great deed, his power will enable me to overcome every obstacle and I shall in the end attain the object of my tedious labours."

In saying this, the traveller, who had all along excited the interest of Juan Perez, entered the convent, where the young Diego received fresh care and attention. Soon afterwards, in a room reserved for the reception of strangers, the prior listened to the following story of his visitor:—

"Yes, my father, I believe that I have been called on by the Almighty to open a new road for the diffusion of his holy religion. I consider that he has chosen his unworthy servant to bear the light of his truth to the countries and islands of the ocean as far as the empire of the Great Khan of Tartary and to the coasts Mangeri and Tartary. I have devised the easiest means of going to these countries of infidels of whom you have heard mention."

"I have also read," answered the prior, "the valuable work of Marco Polo on those regions of India which have been visited by his father, his uncle, and himself. There are many passages in his book that excite my doubts, but I have always wished to see my way clearly in the subjects on which he treats. I have my own notions about cosmography, the stars, and navigation. Since Prince Henry of Portugal, whose spirit is in God's holy keeping, gave such an impetus to nautical science, it has spread in this country more than in any other, not even excepting Genoa and Venice. The pilots of our port constantly sail to the new islands. I have frequently conversed with our seamen, and I shall be glad to hear you speak of your views."

Encouraged by the urbanity of the prior, "First I must tell you," said the traveller, "who I am. My history will give you the origin of my ideas, and my confidence in you will increase, I hope, as you will deign to listen to one who is unknown to you."

Juan Perez assented, and the stranger continued,—"My name is Christopher Columbus. I was born at Genoa, of humble parents, obliged to live by the produce of their labour at the time of my birth. My family was always respected. If ever I become an admiral I shall not be the first of my name."

"What!" exclaimed the prior, "are you the offspring of those Colons

who have assisted France in her Genoese wars, and the last of whom commanded a squadron? I have often heard the exploits of these two seamen related, one of whom was the uncle who took the King of Portugal, Alphonso the African, to carry him to Marseilles. The whole country to this hour remembers the victory of the younger Colon capturing four Venetian galleys off the Sacred Promontory (Cape St. Vincent)."

"Yes," said Columbus, "I am descended from those noble seamen themselves. I have served successively under the orders of both. I fought with the first against the King of Naples, in the cause of Jean d'Anjou, Duke of Calabria, and I was with the latter in the battle of the 21st August."

"But," observed the prior, "your relative had the best of this affair,—How is it you are here with your son, instead of being with him in his victorious squadron?"

"I commanded a vessel," replied Columbus, "which foundered by the side of an enormous galley. The hand-grenades of the Moors set fire to her, but we were lashed together by chains and our grappling irons, and, notwithstanding all my care, we could not get clear of her, and the two vessels became a prey to the flames. The fight continued till daylight, the French fleet was at a distance, three other galleys had been captured, and we had nothing left but to gain the shore, which I happily did with my little son Diego. Situated as I was, I considered it best to return to Lisbon, and I remained there for fifteen years. Now, I avoid Portugal, where my long services have been ignored, and where they have attempted to deprive me of the fruit of my studies. With the Genoese squadron and the protection of the King of France, in the capacity of corsair I should not hesitate to enter the waters of the Tagus. A mere seaman, and deprived of every thing by wreck, I will take good care not to enter again the service of King John the Second, who is surrounded by my enemies. At length I conceived the idea of going to Spain, after this last cruize, to offer my services to the Queen of Castile. Providence has throwu me on this coast and I submit. I could not appear at court but with fortune and rank, but I attempted to do so in spite of my distress. Having come on shore with the remainder of my effects, poor Diego became ill, and I exchanged my clothes to provide for him, and obtained these in which you see me. I have even sold a chart drawn by myself, but my resources are nearly exhausted. It is eight days since we left Lagos. In running along shore we arrived at the mouth of the Odiel and Tinto, by which we have come up to Palos in a fishing-boat. At present we are on our way to Huelva, where my brother-in-law, Pedro Corea, resides, an old seaman like myself, who was, about twelve years ago, the Governor of Porto Santo, near Madeira."

The frankness of Columbus won the heart of Juan Perez, who speedily put some more questions to him on his past life.

"My education," continued Columbus, "was superior far to the condition of my parents. In spite of their low condition, they had

me taught to read and write and to draw. I could support myself by my talent for this art, but I am more inclined to follow the sciences which relate to navigation. I was sent to the university of Pavia, where I applied myself particularly to geometry and astrology (the astronomy of those days), without at the same time neglecting grammar and Latin. At fourteen I embarked for the first time in a vessel of the Republic, since which time I have successfully navigated unknown seas, first in the Mediterranean, either as merchant or corsair, in the vessels of King René, in which I have undertaken some perilous expeditions, and for France, then allied to the Genoese. Since then I have passed the Strait of Hercules into the ocean. At the time of my first shipwreck, in 1470, I was thirty-five years old, when I was established and married at Lisbon, without leaving the sea. In 1477 I sailed a hundred leagues beyond Thule, the southern part of which is in 73° from the equator, instead of 63°, as some assert it to be."

[Thule here is meant for Iceland, situated to the West of the Shetlands. (The Ultima Thule of the Ancients, as it is placed on the chart of Ptolemy.) The opinion of Columbus on the latitude is erroneous, but is fact in history, being found in a letter written by himself to his son Fernando.]

"Having become a subject of Portugal from my union with Donna Filipa de Palestrella, I was enabled to visit without obstruction the new establishments, in the midst of which I resided several years. It was there that my son Diego was born. During my stay in Lisbon I subsisted by the produce of the charts which I made, and sold to princes as well as seamen. My principal study was the form of the world. I have read all the ancient and modern authors on the subject, and I am convinced that by sailing West on the ocean one would meet first the Isle of Cipango, and 1,500 miles beyond it the coasts of Mangi and the empire of Cathay, visited by Marco Polo. I have determined to go and discover those magnificent countries, and this is why I have been so much in Portugal since Diego was born. King John himself has come round to my opinion, but the council of courtiers by whom he is surrounded, jealous of my views, secretly sent away a caravel in the direction which I pointed out. But the pilots had not the courage to follow up the enterprise, returned to Lisbon, and have thrown on me the blame of their own pusillanimous ill success."

Juan Perez at this showed by his look the indignation which he felt.

"Signor prior," continued Columbus, enthusiastically, "Heaven did not permit me to be robbed of my triumph. Your Queen is renowned for her wisdom, perhaps she may grant me what the King of Portugal has refused, and I may yet be the first to approach by sea the shores of Asia! King John desired to renew the subject of the voyage with me; but I refused, after such conduct, and left Lisbon, and am now looking for my scheme to be adopted by some other power. Genoa, my own country, has twice refused my offers.

Venice, her rival, has treated them with disdain. Henry VII, of England, has treated my brother, who went there for me, in the same way. Perhaps Queen Isabella will yet listen to me."

"I have been the confessor of our good sovereign," said Juan Perez, "I may be of service to you. But you must first convince me of the truth of your theories."

"You shall be convinced," said Columbus.

"I hope so," said the prior. "Unfortunately my judgment and my attainments are far from being what they should be; but you will allow me to summon to our councils a medical friend of Palos, named Garcia Fernandez."

While the prior sent some one to call his friend, Columbus knelt before a crucifix in the room and returned thanks to God for having befriended him by a succession of disasters, shipwreck, destitution, and begging bread and water at the hospitable gate of the convent of La Rabida.

Christopher Columbus.

Among the individuals who figured in history in all parts of Europe coeval with Columbus, no one equalled him. The study of his history excites a profound veneration for the man. Our researches into his character have increased our admiration of this pious hero, who combined prudence with enthusiasm, science with courage, and the most lively imagination with the most determined perseverance. His superior courage was displayed in all his actions; his generosity of disposition was no less than his zeal for his adopted cause. It is remarkable that this man in the decline of life never despaired, and that at an age when repose is looked for he undertook the most daring enterprise either of ancient or modern times.

The story he has just related to Juan Perez shows the slender school in which he passed his youth, and how he followed his scientific studies in the midst of hazardous speculations of maritime commerce in peace and war.

The Mediterranean in those days was the theatre of incessant war. It was overrun by fast sailing vessels, equipped by kings and princes on its shores, and even by nobles, who delighted in bloody contests. The discord of republics and Christian kingdoms, their rivalries, their hatred, their battles, their expeditions against Mahometans, the reprisals of these, and the piratical forays of both, made this sea one of blood, strewed with spoils, and the resort of adventurers. Columbus lived in the midst of its heated atmosphere, but he did not permit himself to yield to its attractions, to be disturbed by its bustle, to be led away by brilliant deeds of arms,—his ambition was of another kind.

Columbus meditated the discovery and the conversion of an empire which could only be reached by land with incredible difficulty. The two Polos had been there and returned. Two hundred years before, the sovereign of those countries had demanded from the Pope missionaries to instruct them in Christianity, but the wars which deso-

lated the interior of Asia prevented them from reaching those countries. Since then only one traveller of repute had gone there. "Another road to it must be found," said Columbus, who had solved that problem in his mind.

From that time he became known to, and entered into correspondence with, Paulo Toscanelli, of Florence, one of the first savans of Europe, who had drawn, according to the ideas of Ptolemy and Marco Polo, the Venetian, a chart, which showed the extreme of Asia in connection with the western shores of Africa and Europe. Columbus had no further doubt. The invention of the astrolabe and the application of this instrument to navigation, at the same time facilitated the execution of his design, and he commenced his fruitless labours at the court of John the Second, of Portugal.

Columbus was poor, fortune had not favoured him, he was compelled to live with the most rigid economy, and yet he fulfilled his duty to his children with scrupulous care. He did not neglect his family in the whole course of his checquered life. He devoted a portion of his limited means to the support of his aged father at Genoa, and assisted him to defray the expense of educating his brothers. He conducted himself in a similar manner to his mother-country, having first tendered his services there before he placed them at the disposal of any other.

Such were the views of the old mariner whom the chances of war had thrown on the coasts of Algarvia, and whom Juan Perez found at the gate of his convent.

Night had spread her sable mantle over the waters of the Odiel and Tinto, the summits of the mountain frontiers of Portugal were visible in the faint moonlight, which was reflected by the sea from the southern horizon, and the promontory of La Rabida lay wrapt in silent darkness, and nothing was heard but the convent bell.

"At last," said the prior, "here is our friend Garcia Fernandez."

The doctor of Palos was unable to attend immediately to the invitation of Perez. He threw off his long cloak and entered the room where Columbus was impatiently awaiting him. His exterior was one of extreme simplicity: he wore a large white frilled collar, he was immersed up to the middle, according to the fashion of the day, in large travelling boots and spurs, for his profession obliged him occasionally to repair on horseback to the neighbouring villages. Although he might not be an *hidalgo*, he carried by his side, for similar reasons, a long rapier in his belt; a weapon which was no idle ornament, for on many an occasion he had used it in the gorges of the Atbalegra Hills, which were infested by troops of robbers and vagabonds. The physiognomy of Garcia Fernandez was severe like his costume, but benevolence beamed in his features and his face, without whisker or beard, bespoke a superior cast of mind. Columbus had observed him, and after the first exchange of civilities opened the conversation.

"Heaven will bear witness to my sincerity," he said, "condescend but to give me your attention and judge impartially of the result of

my cosmographic labours. I will first show you the chart of the land such as I believe it is, and such as the learned Paulo Toscanelli, my friend at Florence, represents it."

With these words the old mariner spread out on a massive table of oak a planisphere, over which he had passed many a sleepless night. The prior and his friend drew near to examine it, while Columbus went into an explanation of it.

"The earth," he said, "is, I have no doubt, a sphere, on which it is possible to go round it from East to West by navigating from hence to the extremity of India, where Tartary is situated, and by following the same route which the Polos of Venice took, in 1269, to return to Europe. This opinion has been adopted by the most learned of the ancients. I conclude by adopting it. I shall prove it, please God, by sailing West until meeting with a continent."

After having quoted all the authorities in his favour, mentioning those who were known to be the most learned, and the reports of different travellers who had visited Asia, and particularly Sir John Mandeville, who visited it in 1365, and, having explained his views of geography—a marvellous conception for the time in which he lived,—Columbus was silent, and waited the remarks of his auditors.

Garcia Fernandez with a pair of compasses measured the space assigned to the ocean in the planisphere, and the prior awaited his judgment.

"Yours are grand ideas, Señor Columbus," said the doctor at length; "but this ocean, is it navigable?"

"I shall ascertain," replied the seaman.

"But the storms, will they not be too much for you to brave?"

"I shall see. He who has inspired my design will protect me."

"And if there should be no land where you place it,—if the coasts of India are further off?"

"I shall go on till I find them."

(To be continued.)

JAPAN GOVERNMENT.

Japan presents the singular feature of having two Emperors at the same time, the one secular, the other ecclesiastical. But it is a mistake to suppose that this duplicate sovereignty was established from the beginning as one of the elements of her civil polity; it has resulted from historical events that occurred long after Japan had a system of Government. The Japanese, like many other people, claim for their nation an immense antiquity; but the authentic history of the kingdom commences with Lin-muten-woo (whose name signifies "the divine conqueror"), about the year 660 B.C. Klaproth thinks he was a Chinese warrior Limoadin. Be this, however, as it may, he conquered Nipon and built a temple-palace dedicated

to the sun-goddess, and properly called a *dairi*. His own appropriate title was *Mikado*, though the two terms are frequently confounded by European writers. He was the founder of the sovereignty of the Mikados, and from him, even to this day, the Mikados descend.

He was sole sovereign, both secular and spiritual, and claiming to rule by divine right, added to it that of inheritance also, and their government was a despotism. By degrees these monarchs ceased to lead their own armies, and entrusted the military command to sons and kinsmen, though the supreme power still was theirs. This power, however, appears gradually to have been weakened by a custom which prevailed of abdication by the Mikados at so early an age that the sovereignty descended upon their sons while they were yet children, the abdicating monarch frequently governing for the young king. The cause of these abdications was the desire to escape from the grievous burden of monotonous ceremonies and complete isolation from without, which made the occupant of the throne little better than a royal prisoner.

At length it happened that the reigning Mikado, who had married the daughter of a powerful prince, abdicated in favour of his son, a child three years old, while the regency passed into the hands of the grandfather of the infant monarch. The regent placed the abdicated monarch in confinement, and this produced a civil war. Yoritomo, one of the most distinguished characters in Japanese history, espoused the cause of the imprisoned king, and, after a war of several years, was triumphant, when he released the captive and made him regent. But his regency conferred a nominal authority only: the real power resided in the hands of Yoritomo, who was created *Sio i dai Tiogoon*, or "Generalissimo fighting against the Barbarians." Upon the death of the ex-Mikado, Yoritomo, as lieutenant of the sovereign, virtually ruled for twenty years, and when he died his title and authority devolved upon his son. This was the commencement of the power of the Tiogoons, or Temporal Sovereigns.

Time contributed to strengthen it under the successive reigns of infant Mikados, until it became recognized as hereditary. But, though a very important and, indeed, dangerous power, was thus vested in the Tiogoons, yet the Mikado was looked on as possessing the royal authority, and to him it belonged to appoint the Tiogoon; who was, in truth, the vice-regent, but did not openly aspire to co-equal rights of sovereignty.

This condition of things remained until the latter half of the sixteenth century. The Emperor (Mikado) was an autocrat who had a Sovereign-Deputy (Tiogoon), the efficient and active ruler. During this long period, however, the power of the Tiogoons was silently and imperceptibly increasing, until at last that happened which it requires but little sagacity to perceive could not but be, in the end, the unavoidable result. Men invested with power are more apt to encourage its growth than to keep it stationary or diminish it, more especially when those whose interest it is to check their ambition are known to be imbecile.

It was about the middle of the sixteenth century that two brothers, descendants from Yoritomo, became rivals for the office of Tiogoon. The princes of the empire took no part with the one or the other. Domestic strife raged, and the end of the contest was the death of both the rival brothers.

The mightiest prince of that day was the Prince of Owari, who, on the death of the brothers, immediately set up for himself as Tiogoon. One of the most sagacious as well as the bravest of his adherents was an obscure man named Hide-yosi or Fide-yosi. His station was so lowly that, even in his own time, his parentage was matter of doubt; but his zeal and talents commended him to the notice of his master, and he became the trusted friend and confidential adviser of the Prince of Owari, who, by his aid, succeeded in being appointed Tiogoon. Men's minds had been wrought to such excitement by the civil strife, that when the prince triumphed over his opponents the reigning Mikado did not dare to breast popular opinion, and therefore conferred on him the office. The new Tiogoon of course rewarded his faithful ally, and conferred on Fide-yosi a high military appointment. Recently, the Prince of Owari was murdered by one who usurped his office; he, in his turn, shared a like fate, and now the hour had come for Fide-yosi. When all was in confusion, he seized upon the office for himself, and so well known were his talents and power, that the frightened Mikado at once, without hesitation, approved and confirmed him in the office, and he took the name of *Tayko-sama* (the Lord Tayko). With his title thus legitimated, in the confidence of his abilities he trusted to himself for the rest, and has left behind him a name among the most celebrated in the history of Japan.

He was a statesman and a soldier, and displayed on the throne all the energy and ability which had contributed to place him there. He put an end at once to the civil commotions by giving to the opposing princes of the empire work to do in the invasion and conquest of Corea. He was about marching to subdue China when death arrested him, in the year 1598, at the age of sixty-three. The Japanese to this day consider him as one of the ablest men their country has produced. During his reign he made large progress in the work of reducing the sovereignty of the Mikado almost to a shadow; and, enthralling him by more and more burdensome ceremonials, and a most rigorous seclusion,—all under the seemingly loyal pretext of profound deference and respect for his heaven-born authority,—he quietly left him to "wield a barren sceptre."

Tayko-sama left an only son, six years old. To secure him in the succession, his father, on his death-bed, caused him to marry the granddaughter of one of his own most particular friends and counsellors, Tyeyas, Prince of Micava, from whom he obtained a most solemn promise that when the boy should have attained his fifteenth year he would have him recognized as Tiogoon.

Tyeyas proved unfaithful, became Tiogoon himself, and his descendants to this day hold the office, while a veil of mystery covers

up the fate of the wronged son of Tayko. As to the Mikado, Tyeyas pursued the policy of his predecessor, and, depriving him even of the little power which Tayko had left to him in temporals, he reduced the once absolute autocracy which he represented to a mere ecclesiastical supremacy, and brought him down to the utter helplessness and dependance which this day mark his condition. And this is, in brief, the history of events by which Japan has come to present that singular and unique feature in government of *one* empire simultaneously under *two* sovereigns.

The residence of the Mikado is at Miako; that of the Tiogoon is at Yeddo: each is surrounded with imperial splendour; the one is monarch *de jure*, the other *de facto*. But however absolute may have been the usurped authority of the Tiogoon in the beginning, it has been subsequently very much modified; and certain it is that at this day the rule of the Tiogoon is by no means arbitrary. He cannot do just what he pleases. The laws of the empire reach him as they do the meanest subject. These laws are unalterable, and are exceedingly minute in detail, controlling almost every action of life. The Emperors, both spiritual and secular, are just as much enthralled by them as the humblest man in the kingdom. In times of usurpation or political trouble, they may, in some few instances, have been set at nought, but these are exceptional cases.

There are two prominent features in the Japanese system of government: the one elemental, the other practical, and the two serving as the bases of almost everything else in their polity. The first is feudalism, or something very similar to it; and the second, exhibited in the practical illustration of the government, is a system of checks and balances, founded on an all-pervading secret espionage, ramifying through all classes of society, from the highest to the lowest.

To explain this, we must briefly advert to the several grades of society. We have already spoken of the two Emperors. The Mikado is supreme in rank and nominally recognised as such; but he has not a particle of political power, is not allowed to have troops, and is literally from birth to death shut up at Miako, in his little principality of Kioto; with the revenues of which and the rich presents sent him by the Tiogoon he must be content. Even in his own principality he is governed for, as an independent prince, by some grandee of his court; so that there never lived sovereign with less of sovereign attributes allowed him. But for the tenacity with which the Japanese cling to their ancient usages and laws, the Mikados would, doubtless, have long ceased to form a part of the cumbrous and complicated machinery of government. Formerly it belonged to them to name or appoint the Tiogoon; they may, indeed, nominally have this power, but it is without any real value, as the office of Tiogoon has for a long time been hereditary.

But, politically insignificant as the Mikado is, he is venerated with a respect little if at all inferior to that rendered to the gods themselves. Living in mysterious, though, for the most part, indolent seclusion, he is venerated because he is inaccessible; and is, in truth,

a prisoner, who must find, if he find at all, solace for his confinement in the golden chains and ornamental prison-house of his captivity. No wonder that the abdication of a Mikado is common in Japanese history. As to the Tiogoon, he commands the revenue of the country, has at his disposal an army, and is anything but a prisoner. Once in seven years he makes a visit, surrounded with royal pomp, to the court of his brother sovereign, whom he takes care to keep at all times under the surveillance of unsuspected secret spies. He sends, too, in the intervals between his visits, embassies with rich presents to the shadow king of the holy coast, and receives in turn what he probably deems a valueless bundle of blessings and prayers.

The hereditary classes in society are said to be eight in number; and, except under very peculiar circumstances, no one can leave, through life, the class in which he was born, without a forfeiture of respectability.

Class 1.—These are hereditary vassal princes of the empire.

Class 2.—These are hereditary nobility, below the rank of princes. They hold their lands as fiefs, subject to knight service or the rendition of military service to some of the hereditary princes. If they belong to some of the imperial cities, their military service is due directly to the Tiogoon himself. The number of armed vassals required of them is regulated by the extent of their respective domains. These hereditary nobles have generally sub-vassals on their lands, who are bound to furnish their several quotas of fighting men. Out of this class, governors of provinces, generals, and officers of state are selected.

Class 3.—This includes all the priests of the kingdom; seemingly those of the ancient religion of Japan, Sintoo, as well as of Buddhism.

Class 4.—This is composed of the vassal-soldiers furnished by the nobility of class 2.

These four classes are the higher orders of Japanese society, and enjoy certain privileges of dress. They carry two swords, and wear a species of loose petticoat trowsers, which none of lower rank dare to put on.

Class 5.—These constitute the higher portion of the middle classes, such as medical men, government clerks, and other professional men and employés.

Class 6.—Merchants and shopkeepers, who rank low in Japan, no matter what may be their wealth. Any one of the classes above this would be disgraced for ever should he engage in any trade or traffic. The richest men in the empire belong to this class, and yet they are not permitted to spend their money in a luxurious or ostentatious style of living. Sumptuary laws impose restraints which they dare not violate. They are not allowed to wear even the single sword, unless they purchase the privilege by becoming the menial followers of some great lord, at the price of a considerable sum of money.

Class 7.—This is composed of retail dealers, little shopkeepers, pedlers, mechanics, and artisans of all descriptions save one, to be mentioned presently. Painters and other artists belong to this class.

Class 8.—This consists of sailors, fishermen, peasants, and agricultural and day labourers of all kinds. The peasants seem to be a species of serf attached to the soil, like the ancient villein of feudal times, and belong to the landowner. Sometimes they are hired and worked "on shares," the agriculturist paying the proprietor a certain proportion of the crops.

The exception alluded to among mechanics in class 7, is one which is supposed to have originated in one of the superstitions of the Sintoo religion, which tabooed all who had defiled themselves by coming in contact with a dead body. Whether this be the origin of the exception, we know not; but the fact is well established, that tanners, curriers, leather-dressers, and, in short, every one in any way connected with the making or vending of leather, is placed under ban or interdict. Those of this prescribed class cannot dwell in the towns or villages that are occupied by the other classes, they are not even numbered in the census of the population. They dare not enter an inn, tea-house, or any public place of entertainment. If they are travelling and want food or drink, they must wait outside of the wall of the house, and there be served in their own bowl or platter; for no Japanese, not of their own class, would ever touch or use the vessel out of which they had taken food. Out of this class come the public executioners and gaolers throughout the empire. In short, they are shunned like the leper of old.

Before we proceed to speak of the singular system by which these various classes are governed, it is proper to premise that originally the kingdom was subdivided into sixty-six or sixty-eight principalities. These had been previously independent kingdoms, and were continued, as principalities, under the rule of their respective princes subject, however, to a forfeiture of the rights of the governing family in case of rebellion or treason. This penalty of forfeiture was incurred by many of the reigning princes, and advantage was taken of the circumstance, as often as it occurred, to split the forfeited principalities into fragments; so that, instead of the original number, there are now no less than six hundred and four distinct administrations, including therein, principalities, lordships, imperial provinces, and imperial towns, of which last the Tiogoon himself is the ruling head.

1. There is under the Emperor (Tiogoon) a grand council of state, consisting of thirteen, which governs in the Emperor's name. Of these thirteen, five councillors are taken from the first class we have named, the hereditary princes and vassals of the empire; the remaining eight are taken from the second class, the old nobility below the rank of princes. There seems to be among these a head councillor of state, whose powers and functions are not unlike those of a grand vizier in Turkey. He is called "Governor of the Empire," and all the other councillors are subordinate to him. He decides upon all affairs of moment; has the universal appointing power; receives returns from all the authorities of the empire; may, on appeal, sanction or reverse every sentence of death passed; and, in short, acts for the lay Emperor in all these and some other exercises of sovereignty.

To this grand council, too, belongs the very important power of dethroning the Tiogoon. Important resolutions of the council are always laid before the Emperor, who generally assents without delay or investigation. Should he, however, dissent, a mode of proceeding is pursued which we will describe presently. It is doubtful whether all these high offices are not hereditary; and under these are—

2. Inferior state functionaries, in regular and interminable gradations, consisting of lords, guardians of the temples, commissioners of foreign affairs, governors, ministers of police, superintendents of agriculture, &c. No relative of the spiritual sovereign, however, is ever put into any of these offices.

3. The vassal princes still govern the principalities, or such fragments as may be left to them, with an outward show of their former sovereignty; but it is only show. The princes themselves can do nothing without the consent of the Tiogoon and council. And here we find in full development that system of espionage of which we have spoken. The prince himself, besides being surrounded with a multitude of private spies, unknown to him, who watch his domestic as well as public business and doings, has also two official spies appointed by the chief of the grand council, and these, in truth, conduct the administration of the principality. These are known as secretaries, and both are never permitted to reside in the province at the same time. They alternate yearly. The families of both secretaries reside constantly at Yeddo. The secretary who is in the principality, therefore, leaves his family behind him in the capital as a hostage for his fidelity. When his year expires he may rejoin them, and his colleague then, bidding adieu to his household for a year, takes his place. Each secretary, therefore, is a check on the doings of the other; it is the interest of each to report any *misfeance* in the official conduct of the other; in short, they are spies on each other. But the jealous suspicion of the government is not satisfied with even these precautions. The family of the prince himself is made to reside at Yeddo, and he must spend each alternate year there near the Tiogoon.

And this feature of making officials serve in pairs, as spies on each other, we may here remark, once for all, pervades the entire polity of Japan. Everybody is watched. No man knows who are the secret spies around him, even though he may be, and is, acquainted with those that are official. The Emperors themselves are not exempt; viziers, grand councillors, vassal princes, provincial secretaries, all are under the eye of an everlasting unknown police. The wretched system is even extended to the humblest of the citizens. Every city or town is divided into a collection of five families, and every member of such division is personally responsible for the conduct of the others; everything, therefore, which occurs in one of these families, out of the usual course, is instantly reported to the authorities by the other four to save themselves from censure. It has well been said that Japan is a "government of spies."

We have said that the Emperors are not exempt. The Tiogoon

has his minions about the Mikado, and the grand council have theirs about the Tiogoon. And the cowardice engendered by such ceaseless distrust necessarily leads to cruelty in penalties. Take, as an illustration, the case of a measure submitted by the grand council to the Tiogoon; to which, contrary to his usual custom, he does not at once assent without examination. Suppose he should disapprove: the measure is referred immediately to the arbitration of the three princes of the blood who are the nearest kinsmen of the Tiogoon, and their decision is final. If they do not agree in opinion with the monarch, he must instantly relinquish the throne to his son or some other heir. He is not allowed even the poor privilege of revising or retracting an opinion. Should the three princes concur in the Tiogoon's opinion, then the councillor who proposed the obnoxious measure must *die;* and those who voted with him are often required to die also. Sometimes the whole council, with the "Governor of the Empire" at their head, have in this way been obliged to atone for a mere mistake in national policy by putting themselves to death.

4. As to the government of lordships, which are only smaller principalities, the rule is the same; a duality of governors, an alternation in the discharge of official duties, and a separation every other year from all domestic enjoyment.

5. In the imperial provinces and imperial cities the Tiogoon, or, rather, the vizier and grand council for him, select two governors from the nobility, and surround them with the usual apparatus of secretaries and under secretaries, police officers, spies, and all other officials.

As to the spies themselves, they are of every rank in life below that of the hereditary princes. The highest nobility dare not shrink from the occupation, and even stoop to disguise themselves, the more effectually to perform the degrading office. The fact is, if directed to act as spies, they must either do it or adopt the alternative, *death!* Doubtless many of those who perform this dishonourable work would gladly, were it possible, escape from the degradation; while there are some, ambitious of succeeding to those whom they denounce, to whom the occupation is congenial enough.

A story is told by the writers of Japan which illustrates this.—Complaints were sent to the grand council of the governor of the town of Matsmai; the council resorted to its usual plan of employing a spy. In a little while the offending governor was removed. To the amazement of the people, they recognized in his successor a man whom they had known as a journeyman tobacco-cutter in the town, who, a short time before the displacement of the old governor, had suddenly disappeared from his master's shop. The journeyman was a disguised nobleman, who had acted the part of a spy by order of the Court.

A very singular custom of self-punishment, even unto death, prevails among all the officials of Japan. When one has offended, or even when in his department there has been any violation of the law, although beyond his power of prevention, so sure is he of the punishment of death that he anticipates it by ripping up his own body, dis-

embowelling himself, rather than to be delivered over to the executioner. In fact he is encouraged to do so, inasmuch as by his self-destruction he saves his property from forfeiture and his family from death with him. With many of the high officials it is a point of honour thus to kill themselves on any failure in their department; it is construed into an acknowledgement that they deserve to be put to death by the Emperor, and their sons are often promoted to high positions, as a sort of reward for the father's ingenuous acknowledgement of guilt.

It is easy to see, from what has been said, why the laws and customs of Japan are so obstinately unalterable. Every man is afraid of proposing an innovation, however wise or necessary, because the penalty is so fearful should it not be approved. He who in the grand council offers a measure which is disapproved by the tribunal of final resort, pays for his act with his life. A governor, or lord, or prince, knows that if he attempts any alteration, no matter how salutary, he will be instantly denounced by his colleague or secretary, a spy on his conduct, as a violator of the established usages of the empire and the certain consequence is *death*. So, too, with the common people; broken up into their little sections of five families, they dare not depart in the slightest degree from what is prescribed, for they are quite sure that the authorities will be informed of it, and the penalty inevitably follows. There cannot, under such a system, be anything like judicious legislation, founded on inquiry, and adapted to the ever varying circumstances of life. All must proceed exactly as it has done for centuries; progress is rendered impossible, and hence, in some degree, the difficulty, so long experienced in all Christendom, of bringing the Japanese into communication with other nations. As a remedy for an existing evil, they saw fit, centuries ago, to interdict entirely all such communication; and though the fact admits of proof that many of their wisest men would gladly have seen the interdict removed or modified, as being no longer necessary in their altered circumstances, yet no man dared to propose any alteration.

We may venture to hope that, even in the partial communication with strangers allowed to the Japanese by the late treaty with our country, the first step has been taken in breaking down their long prevalent system of unalterable laws and unchangeable customs. But among a people so sensitive and suspicious, considerable time must elapse before much progress is made in a better direction. And, in the first exercise of our rights under the treaty, it is to be hoped that the greatest care will be taken by our countrymen to avoid everything which can alarm the sleepless Japanese jealousy of strangers; if these be not, there is danger lest in their apprehensions, or perchance in mere caprice, they may seek to undo all that they have thus far done. It is obvious that a great deal depends now on the fairness, good sense, and good temper of our consular representatives. One rash man may overturn all that has been accomplished.

The spirit of espionage to which we have alluded explains also what

all the writers on Japan, and all the officers of our late expedition, represent as a prominent characteristic. We allude to the systematic falsehood and duplicity exhibited, and often without shame, by the high Japanese officials and public functionaries in their negociations and intercourse with strangers. We do not mean to say that these bad traits belong to the people generally. On the contrary, almost every writer describes them as naturally frank in manner, communicative and open in speech on ordinary topics, and possessed of a high sense of honour. They are a people of very ingenious and lively minds, possessed of shrewdness, of great personal bravery, as their history shows, and far superior (at least in our opinion) to any other civilized eastern nation. But the officials are placed in a false position by the wretched system of spies, and dare not act openly and frankly. As government functionaries, they lie and practice artifice to save themselves from condemnation by the higher powers; it is their vocation; as private gentlemen, they are frank, truthful, and hospitable. Mac Farlane, who speaks of this official deception, says, he has observed precisely the same thing among the Turks. Nearly every Turk unconnected with government, may be described as being in his private intercourse a frank, truth-loving, honourable man; while nearly every one holding a government office may be considered exactly the reverse. These facts present a seeming anomaly, and yet we are not sure that something very like it and differing in degree only, may not be found nearer to home than Japan.

The severity of the Japanese laws is excessive. The code is probably the bloodiest in the world. Death is the prescribed punishment for most offences. The Japanese seem to proceed on the principle that he who will violate one law will violate another, and that the wilful violator is unworthy to live; he cannot be trusted in society. Their laws are very short and intelligible, and are duly made public in more modes than one, so that no man can truly plead ignorance; and the proceedings under them are as simple as the laws themselves. There are no professional lawyers in the kingdom; every man is deemed competent to be his own pleader. If a party is aggrieved, he immediately appeals to the magistrate, before whom the other party is soon made to appear. The case is stated by the complainant in his own way, and the accused is heard in reply. The magistrate examines the witnesses, and it is said that this officer generally displays great acuteness in detecting falsehood. He passes sentence, and it is carried into execution *instanter;* and so ends an ordinary lawsuit. If the matter in controversy be of great importance, the magistrate may refer it to the Emperor in council; but if he sees fit to decide himself there is no appeal. Sometimes, in trifling cases, he orders the parties to go and settle the matter privately with the aid of friends, and it is well understood that it *must* be thus settled or unpleasant consequences will result. Sometimes, when both plaintiff and defendant are in fault, he awards censure to both, as they may deserve it, and sends them about their business. We have said their code is

bloody is principle, and very often it is sanguinary in practice. Still the relentings of humanity have forced the administrators of justice to some modification of the theory which prescribes indiscriminate severity.

The magistrate *may* sentence to death, but he is not obliged to do so, except in cases of murder. He *may*, therefore, exercise a large discretion. He may imprison in *raya* or cage. In this case the prisoner is allowed a fair proportion of wholesome food, and provision is made for cleanliness and ventilation. But there is another prison, namely, a dungeon in the governor's house, known by the significant name of *gokuya, hell.* Into this more are thrust than it will conveniently hold; the door is never opened, except to admit or release a prisoner; the food is dassed within through a hole in the wall, and there is neither light nor ventilation except through a small grated hole or window at the top. Books, pipes, and every species of recreation is prohibited; no beds are allowed, and the prisoner is subjected to what he considers the deep degradation of being made to wear a rope of straw around his waist, instead of the usual silk or linen girdle. The diet is limited and very poor; but if a rich man is confined, he may buy better food, on condition that he will share it equally with all his fellow prisoners. The Japanese doctrine is, that if a man of wealth or influence is a criminal, he has no right to fare any better than the poorest man in the kingdom who commits a crime, therefore all shall be treated alike.

We have already alluded to the well known yet remarkable feature of Japanese polity, which has for so long a time induced the government rigorously to interdict all communications between its subjects and foreigners with the single exception of the Dutch and Chinese. This exclusive system did not always prevail. We shall have occasion presently to give the history of its origin, and to place before the reader a statement of the means whereby the Dutch succeeded in the establishment of their commercial factory at Dezima, in the port of Nagasaki. It is only necessary now to remark that, prior to the visit of the United States expedition, no other port but Nagasaki was open to a European ship, and, except at that spot, no Japanese was permitted to buy from or sell to a western stranger. The Chinese had some few privileges of trade, but these were hedged round with jealous restrictions that hampered their commercial relations and intercourse quite as much as those of the Europeans. With this general, and generally brief, view of the leading features of the Japanese government and policy, we pass on to another topic.

The Climate of Ponape or Ascension Island, *of the Pacific Ocean.—By L. H. Gulick, M.D.*

The island of Ponape, probably first seen by civilized voyagers by Quirosa in 1595, but first made known by the Russian Admiral Lutke in 1828, is in lat. 6° 55′ N., long. 158° 25′ E. It is a member of that long range once called the New Philippines, but now known as the Caroline Islands, after the royal consort of Charles II. of Spain. It is difficult to say when or how the name "Ascension Island" was given it. It is inhabited by about 5,000 copper-coloured natives, members of a race that is traced to the East India Islands, and that is probably the progenitor of the Polynesian. The American Board of Foreign Missions established a Mission on it in 1852; and it has since then become an important resort for American whale ships, about forty recruiting there each year.

No island of the whole range, not even of Micronesia, (which includes the Kings Mill, Marshall, Caroline, and Ladrone Islands,) unless it be Guam, of the Ladrone Archipelago, has yet been made a point for accurate meteorological observations, which will enhance the value of records on Ponape.

The following meteorological table, deduced by Mrs. Gulick from her daily observations, extended through a period of three years, will speak for itself of the more important topics connected with climate. It is to be regretted that the want of necessary appliances has rendered these observations much less extensive through the whole field of meteorology than we would gladly have made them. And the present is an appropriate opportunity for making the remark, that missionaries would be glad to serve the cause of science, in an incidental way, much oftener than they do, particularly in meteorology, could they be supplied with those instruments that are much too expensive for them generally to procure. May it not, with due modesty, be suggested to those having the custody of such instruments for the cause of science, that it might be well to entrust her implements to missionaries to a much greater extent than is done, if, indeed, it is at all done. Why call upon them to prepare scientific "bricks" for the master workmen, without granting the requisite "straw," particularly when they are more than willing to labour to their utmost ability consistent with the still higher interests they have in keeping. It is in place to quote a remark made by the Rev. Mr. Mills, of the Navigator Islands, from an article in the *Samoan Reporter*, on *Hurricanes in the South Pacific*:—"Had Col. Reid, when he furnished, through Lord Palmerston and the American Minister, Mr. Abbot Lawrence, instructions to the various consuls for observing the course of storms, at the same time forwarded the like directions to the missionaries of the various societies, I am sure that a large additional amount of information would have been furnished."

Summary of Meteorological Observations on Ponape, during 1853–54–55.

Average for 1853.

Far. Thermometer.—Mean at sunrise, 76·90°; mean at noon, 83·81°; mean at sunset, 78·56°; maximum, 89°; minimum, 70°; range, 19°; mean, 79·75.

Weather.—Number of clear days, 96; showery days, 155; rainy days, 72.

Winds.—N.E. trades, 64 days; calm, 1 day.

Electric Phenomena.—7 days with thunder, 5 days with thunder and lightning.

Average for 1854.

Far. Thermometer.—Mean at sunrise, 79·17°; mean at noon, 82·81°; mean at sunset, 79·54°; maximum, 86·90°; minimum, 74·48°; range, 11·52°; mean, 80·50°.

Weather.—Number of clear days, 97; days with a slight sprinkle, 42; showery days, 174; rainy days, 23.

Winds.—N.E. trades, 239 days; variable, 98 days; calm, 26 days.

Electrical Phenomena.—Thunder, 9 days, 3 with lightning.

Average for 1855.

Far. Thermometer.—Mean at sunrise, 78·78°; mean at noon, 83·33°; mean at sunset, 79·73°; maximum, 87·98°; minimum, 73·76°; range, 12·78°; mean, 80·61°.

Weather.—Number of clear days, 139; days with a slight sprinkle, 32; showery days, 118; rainy days, 35.

Electrical Phenomena.—Thunder 7 days.

Average for Three Years.

Far. Thermometer.—Mean at sunrise, 78·28°; mean at noon, 83·31°; mean at sunset, 79·27°; maximum, 89°; minimum, 70°; range, 19°; mean, 80·28°.

Weather.—Number of clear days, 252; days with a slight sprinkle, 74; showery days, 447; rainy days, 130.

Electrical Phenomena.—28 days with thunder, 8 with lightning.

Of the thermometrical observations, it may be remarked that they were first made with a centigrade, and afterwards reduced to Fahrenheit.

There are few who will not remark the astonishing uniformity of temperature exhibited in the preceding summary. It is to be questioned whether there exists a series of observations exhibiting as great a uniformity, if even as great, in any part of our globe. The South Seas, generally notorious as they are for salubrious equability of temperature, have probably not yet presented anything equal to this.

The mean daily range is about 5°.

The mean difference of successive days is about 1°!

The utmost range of the thermometer, during three years, was from 89° to 70°, only 19°!

The mean temperature of three years was 80·28°.

It should be remarked that the observations till May, 1853, were made in a most peculiarly unfavourable locality, which greatly exaggerated and distorted the thermometric conditions. The remaining observations were made from a locality such as would always be sought for a residence, and will without the slightest difficulty be found in every part of Ponape. By these it appears that the yearly mean is about 80·50°; the utmost range about 12°; the mean, at 7h. a.m., about 78°; at noon, about 85°; and at 9h. p.m., about 79·50°.

Facts to be stated in connection with remarks on the winds and weather, will sufficiently account for this singular equability, particularly when it is remembered what an immense expanse of ocean surrounds all these Micronesian Islands.

The predominating winds are the N.E. trades. During the northern winter, while the sun is in southern declination, and while, consequently, the whole system of aerial currents is drawn to the South, the island is fully exposed to their action. This period usually lasts from December to May, inclusive; though there is much difference in different seasons. At times, the trades do not set in till January, and, again, they begin to blow steadily as early as November, and they cease blowing at any period from April to June. There are certain seasons when they are but faint, even during the dead of winter, as in January and February, 1856; and, again, they may continually intrude themselves during all the summer, as in 1856.

The Rev. Mr. Mills, from observations at the Samoan Islands, with much force inquires,—"May there not be a cycle of trade winds connected with the theory of quadrennial periods, which has been advanced by the author of the *Cycle?*" There seems to be a tendency to cycles of some kind in this Micronesian region, but our observations have not yet been sufficiently prolonged to determine their laws.

It may be remarked that the severer class of gales are comparatively unknown here. The typhoons of the China Sea, and even of the seas North of the Ladrones, about the Bonin Islands, almost never extend to this island. Yet once, during the youth of a few of the very oldest inhabitants now living, a desolating wind swept over the island, so tearing up the bread-fruit trees—the principal reliance for food—that an awful famine ensued, and large numbers died. It would seem possible that this was a cyclone. And it is very interesting that a similar gale produced similar results on Strong Island, five degrees East of Ponape, and that, too, in the memory of the very oldest inhabitants. May not this have been the very same erratic cyclone that swept Ponape?

Of the weather:—Without being able to give accurate udometric figures, the observations recorded regarding the general character of the days exhibit the fact that there is much humidity, though nothing excessive. Situated just on the southern confines of the N.E. trades,

and under the northern edge of the cloud zone that hovers over the equatorial regions between the two trade wind zones of the North and South hemispheres, the island is constantly exposed to precipitations from above. Before the trade winds reach the island, they have made their passage over thousands of miles of ocean, and have become saturated with moisture; so that, as soon as they impinge on the central elevations of our island, some of which are 2,858 feet in height, the clouds are arrested and showers fall; and, as the island is but little more than fifteen miles in diameter, they readily pass over them and water the lee no less than the windward slopes. And again, during the summer, while the trades have receded northwards, we are, ever and anon, shaded by the equatorial clouds, which pour their contents most bounteously; yet we are constantly so near the northern boundery of this zone, that we do not experience its severer, its protracted and unpleasant pouring rains of weeks and months The humidity is consequently more equably distributed through the year than in most tropic regions; yet we speak of the summer as the season most rainy, if not as the "rainy season." It must be remarked, however, that the last year, 1856, during which the trades were very faint through all their usual months, and were quite intrusive through all the months during which they usually absent themselves, was the most dry remembered by the oldest inhabitants.

Of the electric phenomena, I can only report that thunder is rare and lightning still rarer. Thunder was heard only twenty-eight days in three years, and lightning seen only eight days. So very seldom does lightning prove destructive, that the natives have never suspected its agency, but attribute the results to a direct visitation from their *Ani* or Spirits, the only gods they reverence.

Description of the Amoor River, with Particular Considerations Geological, Zoological, and Botanical.—*By Permikin.*

(Continued from page 29.)

(1064 versts.) The mouth of the Burija (Nioman-bira) is 203 versts from Sachaljan. To the right of the Amoor, beyond the wide shore-valley, runs also the mountain chain Tlchuri-Alin. These hills are not high, and covered with weakly oak. On the left side the plain continues; here and there occur hills, fine meadows with a powerful vegetation, and animated by groves of broad-leaved European trees; at the borders of the picturesque woods grow principally hazelnut. Here also might be established extensive settlements; the soil is sometimes pure black earth, sometimes limy. Here we heard the first loud thunder, with a flash of lightning (11th June, new style).

From the mouth of the Burija, the Amoor turns to S.E. The hills of the right side approach; amongst the monotonous formations occur considerable hills, intercepted by cliffs, and covered with oak. On the left side the valley continued, but when we at night arrived at our halting-place (1158 versts), we met an uninterrupted mountain range, branching from the main range in the direction from North to S.W. This chain is nothing else than an arm of the Great Chin-Gan, Dousse-Alin, which sends its shoots on the left hand of the Niomanbira, and to the banks of the Amoor. The shore-valleys here again have a rich vegetation. With this concludes the local character of the low open valleys which predominate for such a considerable extent. The hills approached the river; in the valleys one sees sometimes the fir, and at the foot of the hills low oak. In one of the fields at the edge of the wood, which was covered with wild red-berried elder, we saw a swarm of wild bees. In the course of the day we met on the right bank a few Mantchurian mud hovels at the foot of a narrow valley, which represented a mountain cleft. This country offered nothing but coarse textured granite. Here a large species of bee, occurring for the first time, made us uneasy; from the bite of this insect the blood directly springs forth, and the body swells.

(1158 versts.) The Amoor continues its course between mountains, which approach from both sides. These are branches of the Dousse-Alin, the shoots of which stretch far on the left side of the river. The cliffs of the shore hills are covered with wood; at their foot small alluvials have formed themselves. To the mountain land the Amoor was two to three versts wide, but here it is not above 300 fathoms. The depth in the middle of the river is ten fathoms. Notwithstanding the narrowing of the bed, the current has not become more rapid: it is 4½ versts in the hour. The oaks on the hills are taller and thicker than those in the plains before. Although rich in wood, this mountain country offers no possibility for settlements, from the narrowness of the valleys and the insignificance of the shore slopes.

The formation of the mountains consists chiefly of glimmer slate. By many tokens one may conclude that there perhaps will be found precious metals. The landscape is picturesque and grand, from the varying shape of the cliffs and the luxurious green of the banks which border the large water-belt. The travellers were again molested by the afore-mentioned bees.

(1280 versts.) 215 versts behind the mouth of the Kurija the hills on the left side begin to turn away from the river, and go directly northward; soon the chain on the right bank also turns to S.W. The river itself, after having been freed from the narrowing hills, turns gradually to the East. From this last mountainous country, wide valleys have formed themselves again on both sides of the Amoor, and one meets the same grandeur of nature which was to be witnessed in the preceding plains,—the manifold woods, the most luxurious meadows; and it is only to be wished that men may avail themselves very soon of these gifts of nature. The mountains which confined the Amoor stretch in this direction to fully 120 versts. At its egress

from the hilly country the river is widening again and branching in several arms. On the left bank the mountains vanish gradually from the view, and on the right some groups of them remain visible. Then the same thing occurs reversed,—they disappear from the right side, and appear on the left.

On the 15th June the mouth of the Sungari was reached (1425 versts).

Here, also, Mr. Permikin is unable to decide the question, which of the two rivers is the main arm, for the mouth of the Sungari is a delta, and from the rapidity of the journey they scarcely noticed the giant river which brings with it the waters of Manchuria; but he inclines to the opinion that the Amoor enters the Sungari, because the latter keeps its direction, whilst the Amoor makes here a sharp turn. The hills which rise along the right side of the Sungari-ula approach the Amoor itself twenty versts after the junction of the two. The mountains of the left side spread also on the bank of the river by taking a direction from North to South. At some places they form these steep bank-walls, which are likewise to be found on the right side. On both sides the hills are not high, and are overgrown with oak. The extensive round valley, opening behind the mountains, has a length of 185 versts, its width being unknown. Contemplating the course of the Amoor, which has found its way with only one arm through the mountains, one cannot help thinking that its waters once have pierced the stone strongholds. But this is only a conjecture, and the current of the water has perhaps rather found a ready bed after the fiery catastrophe of the mountain formation.

The country between the Sungari and Ussuri does not offer anything remarkable. The shipping went at first between slimy-sandy banks, dotted with willows, shrubs, currants, and acacias, and in the valleys picturesque oak, elm, maple, poplar, and ash tree groves; and not before the mouth of the Ussuri (1593 versts) the hills which form its right bank—the left one is low—approached to the Amoor. The country where the Ussuri enters the Amoor, now almost wholly uninhabited, offers on both sides wide tracts for colonisation, agriculture, and breeding cattle. The mountains forming the right bank of the Ussuri, a branch of the Sichola-alin, retire further up from the Amoor, and are to be seen a considerable distance. Yet a little further they again approach the river, and form a range of small barren cliffs. The bare rocks of the right side consist of layers of glandy, cinnamon coloured jaspis, talc slate, fast glandy clay, and undulatory tubular flint-stone mass, of one inch thickness, which alternates with the talc-slate. Clayey sandstone projects in large pieces from the rock. Single stones of this kind are lying about at its foot, and they have even and, as it were, ground off sides. Looking at these torn off masses of sandstone, one could believe them to be fragments of a huge building, and not a wondrous work of nature. In the course of the whole day no hill was to be seen (from the mouth of the Ussuri). The country was a wide, low valley, the borders of which were vanishing into the

horizon, fertile, and fit for colonisation. At this day (18th June) it was very hot; in the evening a vehement storm and rain.

Further, the hills of the right bank retired gradually, and were at several places out of sight. From the left side, too, they were not to be seen at first, till an isolated high mountain appeared (1697 versts), at the upper and under end of which were less elevated hills. Thirty versts further (1727 versts) flows a considerable river, with two arms, into the Amoor; the name of which, however, was not known, and which was suggested to be the Dondonbira. On the high bank near the lower mouth were found two mud hovels, and a chapel apparently belonging to the sect of Fo.

The following day (19th June) Mr. Permikin was separated, in his merchant vessel, by a current, from the expedition, and proceeded along a very long island (it seems to be about fifty versts long), where he endured a very violent storm, till he arrived at a village of the Goldians; who received him in a friendly way, after he had given them a few presents, and with whom an animated trade sprang up. They exchanged sable and bearskins for the goods of the Russian merchant vessel. According to the notices of the traveller, the Goldians live next to Sachalgan-ula-Choton, then follow the Manguntsians for 350 versts, and on the last 250 versts, to the mouth of the Giljakians. The keeping of wild beasts, namely, bears, in cages, which was also noticed by Mr. Peschtschuroff, is confirmed by this account.

By the Chinese the Goldians are called Tui-p'chi-cha-tszy (fish-skinned), for making their clothes partly from fish-skin. Near the village of the Goldians the travellers met glimer-slate with irregular formation, penetrated by clay, coloured by iron. At Cape St. Kirile, the distance of which is not given, a violent storm was encountered again.

(1908 versts.) Fifteen versts behind Cape Kirile, the character of the country changes: the hills, till then visible, and which form chains, grow suddenly higher, dense woods occur, the shore valleys become narrower and narrower. In the evening we saw the mountains stretch along both sides of the river in four parallel ranges. The last of them surpassed the others, and was almost woodless. From Schilkinsk to this place we had not met the like. This mountain-country strikes off without doubt from the main knot of the Chin-Gan-Tugurik, the branches of which on the left side of the Amoor enter far into the Manchury, forming innumerable shoots. The high country near the Amoor is particularly remarkable by the influx of a great many large and small rivers from the neighbouring mountain ranges, which enter from both sides the Amoor. Although this river is here wedged in by the hills, there occur, nevertheless, a great many low islands, which are covered with brushwood. The shore valleys, although not wide, have an excellent grass. There may be found for settlement, agriculture, and breeding cattle, many fit places near the river, as well on the banks as in the neighbouring valleys.

The country on both sides is populated by the Tungusian tribe of the Manguntsians, whose small villages are numerous. In their manner of living, dwelling, and clothing, they resemble the Goldians. The banks were grey sandstone, with indistinct prints of plants, and conglomerate, consisting of sandy clay and fragments of quartz and hornblend. All the hills are chiefly covered with oak, partly also with white birch; in the valleys, at humid places and springs, grows fir (2022 versts). The banks are high and have many clefts, out of which rapid rivulets precipitate. The hills near the bank become higher; those which were distant chains had no wood, only in the alluvials occurred here and there a few trees. On the mountain ridges towards the North was snow. The bank was at the bare places principally dense, finely-textured sandstone of a grey colour.

From here (2132 versts) the Amoor becomes richer and richer in the different varieties of sea and river fish.

(2192 versts.) Sixty versts further, the hills on both sides approach the river, and it flows in one arm, which is only one verst in width. The islands disappear, the high banks also, and cliffs are to be seen no more. The mountains are covered with impenetrable wood of fir; the dark green belt of the needle-wood contrasts strikingly with the poplar, ash, and birch, covering the lower valleys; oak occurs seldom. About evening the bank was examined at a halt, and porphyry was found to be predominant. This mass consisted of unequal grains of feldspar and hornblend; the colour of the porphyry was mostly greenish; there occurred also in great abundance chlorite-slate, of a dense formation; and a mixture of this species of slate with quartz, likewise coloured by chlorite.

About thirty or forty versts further was encountered an abundance of fish, such as Mr. Permikin had never seen in his life. Salmon, trout, and carp threw themselves out of the water on different sides; sturgeon, husos, shad-fish sprang out of the water and made a deafening noise. The river was like an artificial fish pond. Further on they came to a place which was called Fats-tse by the Manguntsians. Sixty to seventy versts from this fish-pond the islands begin to appear again in the river. On both sides stretch mountain ranges, the summits of which are bare, but the slopes and feet covered with extremely old needle-wood. Then the river widened again (2352 versts), and the islands continued. At the bare places of the hills was chiefly seen fine-grained slate of a dense texture, with crystals of schwefelkies-pyrites and hornblend. The Manguntsians living on these banks are, like the Goldians, of Tungusian descent. They do not shave their heads like these, but wear it plaited in tails. In their drsss and dwelling houses they have evidently accepted a great deal from the Manchurians. Their dress consists, with the more affluent, of Chinese stuffs; but also with many of them of fishskin, which they get from two species of salmon, and which are strong and durable. They live only by fishing. The Amoor is called by them Mambu.

On the 27th June (2399 versts) Marunsk was reached, near the lake Kisi and the Manguntsian village of the same name. All the

ships, with the exception of the steamer, entered the creek, which is 150 fathoms in length and 10 in breadth.

Mr. Permikin now visited the environs of the military-post Marunsk, which is on the North bank of the lake Kisi. This lake is united with the Amoor by two large arms. It is evident that this low basin lying betwixt the mountains is filled gradually with water during the inundations of the Amoor, and afterwards the pressure of the water forces a passage by these two outlets, by which the lake is now connected with the Amoor. The lake Kisi is about forty versts in length, its breadth varying and nowhere surpassing 200 fathoms. The lake is separated from the Tartarian gulf by a mountain ridge, which sends its branches far on the eastern shore; its breadth between the lake and Castries Bay is not more than fifteen versts.

From Marunsk the left bank of the Amoor is low. The soil consists chiefly of clay, which is penetrated by iron oxide, in which occur in nests kidney-shaped iron ores. Behind the Mandshurian village Kisi the bank is high, and formed by slate with unequal layers and metallic glimmering. Here also are found traces of iron ores. The shores of the lake Kisi are habitated by the Manguntsians. They are occupied also in the capturing of game and especially sable. The dense woods in these parts are rich in sables, but they are of a bad quality. Northern Mandshuria is certainly the utmost limit for the sable, and only the extensive needle-woods, the high mountain ridges, and the uninhabited state of the country could allure them to emigrate further southward, The further one ascends the tributary rivers of the Amoor, as the Seja, the Burija, Aemgun, the better becomes the sable; beyond the Chin-gan, in the valleys of the Utschur, the Olekma, the Adan, and Ud, it attains its finest quality.

After a few days sojourn, Mr. Permikin went further down the Amoor in a barque. He halted for the night ten versts from Marunsk, at the Manguntsian village Pul. From there, proceeding further down the Amoor, he found several varieties of iron ores, with alternating layers of slate and quartz in it. The slate here had been obviously under the influence of fire; in its layer was ironblend, from which the inflamed layers received their metallic tint. The country is mountainous. Very high hills stretch along both banks, which are densely covered with an impenetrable virgin wood. This is the realm of the larch tree, the Siberian stone-pine, and other needle-trees. On the slopes of the hills and in the valleys one finds poplars, birches, and oaks. Here would be required much labour for settling. The clearing of the wood for agriculture would occupy ten years. The banks are not fit for cattle-breeding, except a few low islands, which, however, are submerged at high-water. The following are the villages of the Manguntsians we passed:—Aur, Mongole, Kodi, Choima, Kadema. Each of them had but a few wretched huts.

From the last named place downward, Mr. Permikin found that the slate contains ochre indications of the presence of iron ore; it was mixed with masses of green stone, with an admixture of hornblend, porphyry, and feldspar of different colours, which were couched in

irregular layers. In the first village behind Kadema, Pul, the traveller met a new Tungusian tribe, the Samagirians; which, together with the Negidatzy or Nischdaltien, and four other tribes more, live near the banks of the Aemgun. 250 versts below Pul one finds the dwelliug-places of the Giljakians. The villages passed were Tendscha Okto, Cher, Turadi (Taralda), Polmi, Cholola, and Pat. The Giljakians have experienced the influence of the Mandshurians less than the tribes living further up. They are addicted to the grossest Schamenism. Amongst them the revenge for bloodshed is a custom. Infidelity of wives is punished by death. The stone species remained the same further down, only a fine-grained chalkstone, of a dense texture and ashgrey colour with quartz in it, was added to them. The wood-covered hills border the river to the mouth on both sides. The Giljakian villages passed were,—Mangal, Dengdala, Achta, Dyrmi, Aur, Tschiloi, and Tyr.

One verst from this place are to be found renowned monuments on the open summit of a big overhanging rock which projects into the river. The first monument, two paces from the edge of the rock, is two yards high; the undermost stone is granite, the uppermost—an irregular cube, a little rounded off on the top,—is grey fine-grained marble. There are inscriptions on it. The Archimandrite Aovakum deciphered them thus:—that there once stood a Buddhist temple on this site; that the Chinese inscription on the broad side, *Tszi-jun-nin-sy*, probably written by a little-educated Lama, ought to be, after the Chinese construction, *Tun-nin-sy-tszi*, *i.e.*, "Inscription over the cloister of the eternal peace." On the left side are written, in Tibetan letters, the following Sanscrit words, *Ouc-mani-bad-me-chun*, *i.e.*, "Oh Mani Badma grant!" Under it, in Chinese, *Dai-juan-schoutschohi-li-gunbu*, *i.e.*, "The great Tuan spreads the hands of strength everywhere." In a second parallel line to the left are the words, *Om Mani-bad-me-chun*, both in Chinese and Nigurian. The inscriptions on the right side are the same. The second monument is from the former four paces, and from the bank two. It consists of an octagonal basis, on which is standing a column; one sees clearly that there has been a second one on it. Five paces further is another, similar to the first; and 150 fathoms further, on a steep cape projecting into the river, a tall octagonal column. The Russians were acquainted with these monuments as early as the seventeenth century. There then existed a chapel with a bell, and the Siberian section possesses a manuscript from the year 1678, in which is said about this matter,—"The inhabitants there say that in olden times a Chinese Tsar went by sea to the Amoor, and, as a token of remembrance, he caused to be erected this inscription and a bell."

From these solitary towering monuments the view is most beautiful. Towards the South a dark ocean of woods, from which, here and there, bare rock summits raise their heads. Just to the North, at the opposite bank of the Amoor, one notices a wide valley, in which the Aemgun rolls down its waters. It forms at its wide mouth a delta, consisting of islands, covered with thickets of trees and shrubs.

The traveller passed further the villages Choe-Charme, Ao, Chada-Charme, Kuga, Takle, Talwe. The Samagirians call the Amoor Changa; on a Chinese map in the archives of the Geographical Society its name is Chinkon. On the left bank, at Teliva (Tschelm), was slate and fine-grained dense amphibolit of dark green colours. Further on, porphyry also predominated, in the mass of which were small pieces of feldspar and hornblend, with a mixture of small leaves of mica. The expedition passed by the villages Daigassia, Deaba, Chalga Kalgo, Mago, Anadiwa, Wait (the last, with thirty houses, is the most populated on the whole track), Saback, Kaki. On the bare places of the mountain is to be seen only porphyry. The weather here was very unfavourable, and the current of the river so rapid, that it drove back the boat, in spite of the rowers On the last way to Nicolajewsk the bank consisted of large layers of porphyry, opposite which followed slate of a reddish colour.

In Nicolajewsk Mr. Permikin stayed for three days, during an incessant rain, which reminded him of the periodical rains of Irturk (10th, 11th, 12th July, new style). The post is very highly situated; the banks of the creek were formed by alluvial. From Nicolajewsk to Petrowsk is 120 versts. The bare rocks of the bank consist for the most part of dark red lava, which incloses cells of a white colour, empty inside. Sometimes occurred layers of sandstone, in which was seen an admixture of amphibolite and frequently very fine-grained slate of ash-grey colour. On the Cape Pausa, which the Russians have named Polosatik, there was found limestone of a red colour, in which were inclosed petrified craw-fish. This is a superior material for lime. The bare lime rock enters 1½ verst into the liman. On the shores of the liman everywhere species of porphyry and lava were to be seen. The rock island Chanschigir, where the voyage ended, consisted thoroughly of slate, inclosing not crystalized sulphuric pyrites (Schestefelkies). In the alluvium of the bank occur several varieties of agate. After a sojourn of only a day in Petrowsk, the travellers went on board the steamer *Wostok* to Aja. The islands of the Amoor liman are partly inhabited by Giljakians, partly uninhabited.

(To be continued.)

The Channel Islands.

Alderney is ten miles from Cape la Hogue and is not more than eighteen miles from Cherbourg. A vessel scarcely out of the latter port discovers in the horizon the traces of Alderney, which, notwithstanding the comparative reserve which I have thought it right to throw on this subject, presents in its wild aspect sufficient to attract the attention of the tourist.

Seven miles to the East of Alderney are the Caskets, celebrated for the wreck of the young Prince William, son of Henry the First, King of England. This prince left Barfleur in his ship with the English fleet, lost time in dallying with pleasure, neglected the orders of the ship carrying the flag of his father; all discipline and prudence on board was lost, and the ship became a wreck. The prince was enabled to save himself in a boat, but the cries of his sister, who had crossed over with him, induced him to return to the wreck, and the number of persons who crowded into the frail skiff, anxious to quit the half sunk vessel, swamped her, the only means they had of being saved. The captain and a seaman were the only persons saved on a fragment of the wreck, but the captain, on learning that the prince was drowned, ceased to contend with the waves, and voluntarily shared his fate. The king, whose paternal affections were thus cruelly outraged, is said never to have smiled afterwards.

Miss Martineau, in her history of the Queens of England, gives the following narrative of this catastrophe.

Death of Prince William, only Son of Henry I, (Beauclerc).

The King of France, as *suzerain* of Normandy, at the general pacification, required of Henry the customary homage for his feof. This the victorious monarch considered derogatory to the dignity of a King of England to perform, and therefore deputed the office to Prince William, who was then invested with the duchy, and received the oath of fealty from the states. The prince solemnly espoused his betrothed bride Alice, the daughter of Fulk, Earl of Anjou, June, 1119. King Henry changed her name to Matilda, out of respect, it is said, for the memory of his mother; but more probably from a tender regard for his deceased consort, Matilda of Scotland, the love of his youth, and the mother of his children. The marriage was celebrated at Desieux in the county of Burgundy; and the prince remained in Normandy with his young bride, attended by all the youthful nobility of England and the duchy, passing the time gaily with feasts and pageants till the 25th of November, in the year 1120; when King Henry (who had been nearly two years absent from his kingdom) proceeded with him and an illustrious retinue to Barfleur, where the king and his heir embarked for England the same night in separate ships.

Fitz Stephen, the captain of the *Blanche Nef*, (the finest vessel in the Norman navy,) demanded the honour of conveying the heir of England home, because his father had commanded the *Mora*, the ship which brought William the Conqueror to the shores of England. His petition was granted; and the prince with his gay and splendid company entered the fatal bark with light hearts, and commenced their voyage with mirth and minstrelsy. The prince incautiously ordered three casks of wine to be given to the ship's crew; and the mariners were, in consequence, for the most part intoxicated when they sailed, about the close of day. Prince William, who was desirous of overtaking the rest of the fleet, pressed Fitz Stephen to crowd his sails and put out his sweeps. Fitz Stephen having

named the "White Ship" as the swiftest galley in the world, to make good his boast and oblige his royal passenger, caused his men to stretch with all their might to the oars, and did every thing he could to accelerate the speed of his light bark. While the *Blanche Nef* was rushing through the water with the most dangerous velocity, she suddenly struck on a rock, called the "Catte-raze," with such impetuosity, that she started several planks and began to sink. All was instant horror and confusion. The boat was, however, let down, and the young heir of England, with several of his youthful companions, got into it, and having cleared the ship, might have reached the Norman shore in safety; but the cries of his illegitimate sister Matilda, Countess of Perche, who distinctly called on him by name for succour, moving him with a tender impulse of compassion, he commanded the boat back to take her in. Unfortunately the moment it neared the ship such numbers sprang into it, that it instantly sank with its precious freight; all on board perished, and of the three hundred persons who embarked in the "white ship," but one soul escaped to tell the dismal tale. This person was a poor butcher of Rouen, named Berthold, who climbed to the top of the mast, and was the next morning rescued by some fishermen.

Fitz Stephen, the master of the luckless "white ship," was a strong mariner, and stoutly supported himself for some hours in the water, till he saw Berthould on the mast, and calling to him, asked if the boat with the heir of England had escaped; but when the butcher, who had witnessed the whole catastrophe, replied, "that all were drowned and dead," the strong man's force failed him; he ceased to battle with the waves, and sank to rise no more.

The report of the disaster reached England the next day, Theobald of Blois, the king's nephew, was the first who heard it; but he dared not inform his uncle of the calamity which had rendered his house desolate. The Saxon chronicler says, there perished another son of Henry and Matilda, named Richard, and also Richard, a natural son of the King, Matilda, his natural daughter, Countess of Perche; Richard, Earl of Chester, his cousin, with his bride, the young Lady Lucy of Blois, daughter of Henry's sister Adela. and the flower of the juvenile nobility, who are mentioned by the Saxon chronicler as a multitude of "incomparable folk."

King Henry had reached England with his fleet in safety, and for three days was permitted to remain in a state of the most agonizing suspense and uncertainty respecting the fate of his children. No one choosing to become the bearer of such evil tidings, at length Theobald de Blois, finding it could no longer be concealed, instructed a favourite little page to communicate the mournful news to the bereaved father; and the child, entering the royal presence with a sorrowful step, knelt down at Henry's feet, and told him that the prince and all on board the "white ship" were lost. The great Henry was so thunderstruck with this dreadful news, that he staggered and sank upon the floor in a deep swoon, in which he remained for many hours. When he recovered, he broke into the bitterest lamentations, magnifying at the

same time the great qualities of his heir and the loss he had sustained; and the chroniclers all agree that he was never again seen to smile. The body of Prince William was never found, though diligent search was made for it along the shores. It was regarded as an augmentation of the calamity that his delicate form, instead of receiving Christian burial, became a prey to the monsters of the deep.

The Casket Rocks, however, have been questioned as being the cause of this catastrophe. But another occurred in 1701 which placed beyond a doubt the dangerous nature of these rocks, and in 1709, at the instance of the Governor of Alderney, the Queen directed a lighthouse to be erected on the rocks. It was properly established, and, in the course of time, has been occasionally improved. But it is remarkable that even the government of the island has long been hereditary in the family of Le Mesurier. A colonel of this name is the present governor. At this lighthouse (completed and first lighted in 1723) he has a surveillance confided to him, from father to son a family of guardians isolated from the rest of the world. Children are born there far from the world which they are destined never to see; learning nothing more of creation than the existence of the raging elements, of the tremendous waves raised by the storms that often dash over the towers and break the lanterns. This colony, standing as it were sentinel in the sea, seems to have no other enjoyment than affection for their isolated fire-side, no other occupation than to cultivate a few kitchen plants on a sandy strip of land, forgotten by the world among the rocks by which they are surrounded.*

Among the natural curiosities of Alderney is a hanging rock, or one inclined at a considerable angle, the height of which is estimated at fifty feet. The problem of the leaning tower at Pisa is here produced by the hand of nature.

Guernsey, like Alderney, has dreams of war in the midst of peace. Fort George, which is considered impregnable, commands the town and the road of St. Pierre du Port. A belt of detached forts, for which the numerous rocks have been turned to account as they stand scattered about the island, protecting every fraction of the archipelago.

As at Alderney, the works of defence at Guernsey have been pushed forward with a wonderful activity,—the western part of the island, the weakest in a military point of view, is protected by two new forts, Richmond and Laucreffe. The town of St. Pierre du Port, the chief place in the island, is especially covered by Fort George, which completely commands the island and its approach by sea.

Sark is the Brighton of the Channel Islands, to which the English make pleasure trips from Jersey and Guernsey. I would speak of Sark as the alluvium of Switzerland,—but the analogy will be incomplete unless I tell you that this favoured island seems to have borrowed the misty precipices of Scotland and her caverns of stalactites, and the magnificent pictures which it presents are rather calculated to inspire the sentiments of Fingal than the memory of William Tell.

* There is more of spleen than truth in this, whoever wrote it.—*P. D.*

The most celebrated site on the island is called the Couppée, which seems to be suspended between two bays and belonging to either, presenting a marvellous appearance. The height from which the abyss below is contemplated, diminishes objects so much, that they look like insects crawling about and difficult to be discovered. I should become tedious if I were to pretend to give you an idea of the pictorial treasures of Sark. They are not always known to visitors, and a stay of some time is not too much to see all the treasures of this corner of creation, where Nature seems to have made her grandest effort in rising from old ocean's bed, It is said that M. Victor Hugo who lives at Guernsey, and often visits Sark, intends illustrating this island by making it the theatre of a romance or one of his poetic essays.

I shall content myself with adding in conclusion that Sark is perhaps the only remnant of the old world where a feudal lord is to be found holding all the sovereign rites of the island which he possesses as his property: tourists frequent it to admire his residence, where they find amidst his garden the most pleasing variety of cultivated orchards, the sea contributing to ornament an English garden in the two bays on a magnificent scale. The person who occupies this seignory at present is the Rev. M. Gosling, an English minister, who entertains visitors with the most liberal hospitality.

St. Malo. The works projected West of St. Malo, the principal of which consists of the construction of a port of refuge, are proceeding with great activtiy. Two great works are yet to be submitted for the approval of the Emperor. One consists of a plan of extension commencing from the mole and including the Logue and the Pouilloux Rocks: a dyke will unite the bay with the town, and the bay will become a war establishment: the second includes the great bay in the town itself.

SOUTHAMPTON TO ACAPULCO,—*with Jottings by the Way.*

Facility of travel, we all know, begets intercourse, and, as it were, "makes the food it feeds on." The road which only fitfully sustained the old stage-coach, now yields a steady stream of customers to the long line of carriages at the tail of the railway engine; and the ocean highways which were crossed at long intervals by sparsely tenanted sailing smacks, are now-a-days periodically ploughed by leviathan steamers filled to repletion, like troop ships, with impatient voyagers, who seem like so many propagandists, carrying the locomotive epidemic to every corner of the globe. It requires no great stretch of memory, nor any very distressing admissions of antiquity, to call to mind the period when our West Indian possessions were regarded as too remote even for the occasional visitations of a slave-owning pro-

prietary—when local overseers usurped the functions and appropriated the profits of their employers, from the impunity which distance and difficulty of access afforded them—when the mails and the sugar crop came forward in the same craft, and Jamaica rum and new coffee were in the bonded warehouses as soon as the bills of lading reached the counting houses of the consignees.

But the requirements of commerce and intercourse hatched into life an associated company, organised for the purpose of promoting a more rapid interchange of personal and epistolary communication; and although this company commenced its operations when the effects of a vast political change had in a great measure prostrated the capabilities of our colonies in that quarter of the globe, it has continued to grow steadily in greatness and importance; but notwithstanding its progressive growth and the vast augmentation of its resources, the resuscitation of industrial pursuits and the active stimulus given to trade throughout the West Indian Islands of every nation are fairly outstripping all the increased accommodation which it has afforded. Even a bi-monthly mail, carried in vessels of enormously increased size and power at accelerated speed, fails to keep pace with the steadily advancing increase of passenger intercommunication within the limits of the original contract. Of this I had demonstrative proof mysel fin my late trip to Colon; and what with the certainty of an indefinite swelling of the passenger traffic from the opening of the Panama route to Australia, the rush to the new and attractive colony of British Columbia, together with the influences of free intercourse with China and Japan, I entertain not a shadow of a doubt that the Royal West Indian Mail Steam Packet Company will evince no more than ordinary prudence and foresight in putting on a weekly boat of great size and power direct from Southampton to Colon, confined as at present to a select class of passengers; for, without entertaining any exclusive or conventional ideas on the score of social communion, I am unable to imagine any plan either of demarcation or amalgamation which would work at all smoothly and comfortably, at least so far as the Isthmus, up to which point there is invariably a very considerable proportion of lady passengers accustomed to the courtesies and amenities of polished life, traditionally familiarized with decency of costume and the propriety of expletives—habituated to regard the knife and fork as distinctive implements, and wholly unused to pipe-smoke or tobacco-juice.

I heard at St. Thomas that a company is about being formed at Jamaica having for its object the erection of a patent slip there capable of accommodating ships of the largest tonnage. It is to be hoped that the project may be carried out, for then steamers engaged in the intercolonial trade could be fresh coppered on the station; and, more desirable still, iron vessels could then be permanently employed in these waters, from the facility which would be thus afforded in cleansing their bottoms—an operation at present impossible even by the very dangerous alternative of beaching, as the average rise and fall of the

tides in these quarters is little, if anything, in excess of one foot. Some years ago the iron ship builders in the Clyde offered a large reward for the discovery of any expedient that would keep iron free from fouling in tropical latitudes; and as no doubt their liberality was in some degree actuated by the expectation of extending their business, I should be inclined to think that they would be likely to take a substantial interest in an undertaking which would undoubtedly tend to similar results.

In going down from St. Thomas to Colon, we touched at Santa Martha and Carthagena, and alas, alas! for the pride and glory of Spanish dominion in the olden day. With all the evidences of architectural pomp and grandeur, all the colossal structures of engineering skill—standing on foundations of illimitable mineral wealth, and reposing in a climate where bountiful nature delights in showering her choicest favours, those cities are fast being wholly obliterated—swallowed up by the rapid encroachments of tropical vegetation. Already Santa Martha should in justice be debarred from retaining the appellation of a city. A human warren would be by much the more literal designation, for with the exception of the few unfortunate expatriated consuls, the inhabitants can be scarcely said to live in dwellings. They rather burrow in mines; and in personal squalor and physical decrepitude are in perfect keeping, so far as appearances go, with the mouldering city; while fowls and animals, pigs, dogs, and poultry, are one and all of a lank, famished, mangy aspect, which contribute to the painful perfection of the deplorable *tout ensemble*. Yet copper pyrites crop up from the ground all around this doomed location. The ravines in the adjoining mountains abound in gold and teem with quicksilver ore; but all those natural blessings are lying fallow, marred by the detestable sloth and utter demoralisation of its mongrel degenerate people.

Carthagena is not altogether so far gone in desolation and decay. As you enter the jaws of its spacious harbour the low-lying batteries on each side, so admirably constructed for hulling the vessels of an invading foe, are still perfect in so far as the mason is concerned, but in other respects resemble the toothless gums of a worn out *débauché*.

On sailing up the inland waters the city itself presents an imposing appearance, studded with massive church towers and belfries, which relieve the great dead sea of monotonous tile roofing, while the bold towering mount on its South-western flank, crowned with a ruined convent, superadds a glorious feature to the landscape. But proximity robs the scene of its distant enchantment. The charms of freshness and beauty depart as you approach, assuming the repulsive reality of premature gangrenous haggardness, and loathsome atrophy. No hum of trade, no sound of industry, no strain of happy domesticity challenges the attention as you stroll through its empty streets, and when at intervals you descry an inhabitant within doors he seems to be in a state of semi-torpidity, and gazes at you with a glassy stare, as if the optical effort were the effect of galvanism. There is no trade with

the interior, no communion from abroad save the slight intermittent whisper carried by the intercolonial steamers. In fact, Carthagena may be said to drag out a languid existence on its own pinched vitals, which cannot long continue to sustain it. The British consul was alone in his diplomatic glory at the time of my visit, without an European or American family within the sphere of his jurisdiction to get up a little social intercourse as an antidote to the prostrating tedium of unemployed existence. In the exuberance of his credulity he brought out with him a handsome phaeton, that his wife might take her evening airings; but a yacht in the desert of Sahara would have been equally available for recreation or exercise. There exist no roads or drives in the vicinity, and such is the fatal compound of aboriginal sloth and Spanish pride amongst this doomed people, that Mrs. B. could not, for love, money, or persuasion, induce any of the sable lads or lasses to whirl about her young child in a spick and span new perambulator, so did it "astonish the natives." What is the use or policy of appointing consuls to such places?—what British interest is there to conserve or protect?

What a contrast does not Aspinwall—or Colon, as we Britishers persist in calling it—present to the tottering old cities along those coasts. Here is a little town of yesterday springing up like a mushroom, gleaming at all points with genu-yne Yankee precocity and energy, unassisted by state aid, but nevertheless shooting a-head from the mere wholesome stimulus of private enterprise. There are wharves, and stores, and offices, and restaurants, and hotels, tenanted by sharp-visaged, keen-witted tenants, who do not wait listlessly for business to find its way to their doors, but who emulate each other in waylaying it, coaxing, cajoling, and wheedling it with all the earnestness of "down-east" blarney. The luxuries and amusements of old country life may be enjoyed there too. Wenham Lake ice and Thurston's billiard-tables are in full bloom existence in this new location, and a crowning proof of enterprising promptitude may be seen perched on the points of some tall scaffolding poles at the salient points of the roadstead, in the shape of an extemporised lighthouse, which, rude though it may be in appearance, answers its purpose most admirably, as I can personally vouch, for by its friendly rays, seen at a distance of twelve miles, our steamer was enabled to come to her moorings at midnight, and start her passengers by the first morning train across the isthmus.

In the old country the Panama Railroad is regarded as a sort of make-shift affair, laid in hot haste over miasmatic quagmires on crazy piles, or sidling along steep hill-sides and yawning ravines at a slant or angle of 45°, with creaking bridges, infirm cars, and cashiered engines; and, well-seasoned as I am to "moving accidents by flood and field" in the way of wild travel, I admit that, could I have transported myself by wish across the isthmus, I should not have troubled this tropical railroad. However, I stand indebted to necessity for dispelling the misconception, and enabling me to assure the British public that the Panama Railway has been most grossly misrepresented, and

that whether for the purposes of passenger traffic or for the transit of heavy merchandise, it is quite up to the average of European or American lines. I stood for the greater portion of the trip on the platform at the end of the hindermost carriage, where I had an excellent opportunity of observing everything, and I must say that I never saw a more regularly or substantially laid road, nor one more securely bridged or more carefully ballasted. There are no tunnels on the line, and the only drawback I could perceive was the inevitable sharpness of some of the curves, where, however, all danger is avoided by an abatement of speed. The carriages are of course constructed on the Yankee principle, with jointed seats and central passages. There is no attempt at luxurious fittings or gaudy decorations. The sides of the cars are made of Venetian blinds, which can be lowered or lifted at will, and the backs and bottoms of the seats are formed of open canework, where one can enjoy a cool seat. At various places along the road, as the train emerged from the thickly twined arboreous tunnels of tropical jungle, we enjoyed glorious glimpses of grand timber-clad mountain peaks stirring with insect and animal life, and picturesque peeps at the lazy Chagres River, curling its course between precipitous banks and laving the nether ends of countless dozing alligators. The natives alone stood out in bold contrast to the magnificence of nature, and at the different stations where we stopped they and their domiciles exhibited the *ne plus ultra* of animal squalor and indifference. We performed the crossing in a leisurely way in four hours, and found an excellently appointed omnibus waiting to take us to our various hotels.

After an absence of eight years I found Panama retrograding in the teeth of all the favouring circumstances which late times have brought to its door. Acres upon acres since then of its suburbs have fallen into ruin and are now overshadowed and hidden by impenetrable trellices of evergreen vegetation. Roofless churches betray the name of that sacred order which nerved Cortes and Pizarro for their almost preternatural conquests. Toppling fortifications exhibit the decease of Castilian chivalry; and the great, gloomy, tenantless mansions of the present day suggest lamentable reminiscences of contrast between the magnificent splendour of the proud Christian invaders and the semi-beastly habits of their degenerate posterity. It is only justice, however, to admit that Panama derives little positive benefit from the human torrents that pour through its thoroughfares, for the electric wire flashes the arrival of the packet at Aspinwall, and that on the Pacific has the steam up ready to start on the arrival of the mail and passengers, for whom a small tender is waiting at the railway pier to take them on board as they leave the cars. The complete trans-shipment from ocean to ocean of freight, mail, and passenger is effected on the average in eight hours, and on special occasions has been performed in four; but even the longer period, in my mind, furnishes a perfect triumph of arrangement and expedition which adds a proud feather to the cap of Cousin Jonathan for his talent and organisation.

The only foreign coin, I may say, spent in Panama is the British

sovereign; for, with a sublime contempt for the convenience of their clients, neither of the British companies on the Atlantic or Pacific side seems to care about dovetailing or making of arrangements with the American companies, whereby vexatious and expensive detention might be avoided. It is to be hoped, however, when the Royal West Indian Mail Packet Company extends its ramifications beyond the isthmus that its proceedings will be regulated in more perfect accordance with the spirit and necessities of the age.

There still exists a bitter feeling of animosity between the Panamites and the Americans, and it is predicted that another sanguinary row is impending, and only repressed by the presence of American frigates on either side the isthmus. The President of New Grenada, in order to stave off the indemnity for the late affray, makes a show of keeping up a military force to terrorize his subjects into good behaviour, but such a ludicrous parody on soldiering I did not conceive could possibly be produced even in the wildest exaggerations of dramatic burlesque, whether I take the men, their arms, their uniform, or their evolutions —for I went to see this martial body at drill, and was compelled to admit mentally that Bombastes Furioso and his mock herioc troops were utterly vanquished in grotesque absurdity by the army of the isthmus. I afterwards saw three of this gallant corps guarding a batch of prisoners who were cleansing some kennels in the city. But these military gendarmes were stretched at full length in a somnolent state under the shade of a projecting balcony, and I was curious enough to observe that only one out of their three muskets was furnished with a lock. I was credibly informed that a few months ago a soldier was sentenced to be shot for an act of insubordination; but after being peppered at for a whole hour at regulation distance, the commandant was obliged to give the order to advance, and the wretched culprit was eventually consumed in flames, the wadding of the marksmen having set fire to his cotton clothing. As a Yankee remarked who accompanied me to the review, "a score of smart boys well shod would 'boot' the hull armee."

I left Panama on the 1st November, by the *Golden Gate*, a splendid boat—a sort of cross between a North River packet-boat and an ocean steamer. She is one of the Aspinwall line, and is certainly a credit to the company both *per se*, and from the exquisite discipline and management of her officers and men.

I am unable to send you any later or more reliable news concerning British Columbia than you are at present in possession of. Any information to be gathered as I go along the coast here is filtered through American jealousy, and consequently not to be depended on; for admitted prosperity in our new colony would clash disastrously with Californian progress. Americans sneer at the gold discovery there as the great hoax of the age, and affirm it was concocted by the Hudson's Bay Company that they might be enabled to sell out the short residue of their tenure for a thumping sum.

As I write on this 7th November morning, we are entering the

beautiful land-locked harbour of Acapulco to coal. Like the other cities I have alluded to, it is gradually sinking into obliteration, the only spark of vitality being that which scintillates periodically as the up and down going steamers make their fleeting calls. We leave again this evening, and cross the home-going mail (which will carry this) in the course of to-morrow.—*Daily News.*

The New Hydraulic Lift at the Victoria Docks.

The delay, expense, and inconvenience attendant upon placing a vessel in dry dock, either for the purposes of examination or repair, have long been a practical evil, productive of the worst results to the shipping interest. Yet the difficulty seemed to admit of no solution; for, as the dry dock could only be entered or left at high water, this delay, productive of the greatest amount of inconvenience, appeared unavoidable. The subject at first sight does not appear to have the influence on the safety of shipping which it in reality has. But when it is considered how frequently shipowners send their vessels to sea in a defective state of repair, rather than incur the expense and delay of having them docked, it may be easily understood how large a proportion of the vessels reported as foundering at sea may trace their destruction solely to this cause.

A short time ago, however, an expedient was discovered, which afforded a speedy and efficacious means of docking and undocking a ship for the purpose of examination, during all phases of the tide in about two hours. The plan consists of sinking a shallow pontoon under the ship to be docked, and afterwards raising it, ship and all, bodily out of water by hydraulic power. The pontoon having become clear of water, the valves are closed, watertight, and the apparatus towed away to some suitable position with the ship on it high and dry.

The Victoria Dock Company, seeing the advantages and the feasibility of the plan, soon after its invention entered into contracts for the construction of an extensive series of wet docks, in connexion with their property. The works, which have recently been completed, occupy about ten acres of water, and consist of one deep dock, in which the hydraulic apparatus for lifting the ships is placed, and eight shallow docks for the reception of the pontoons containing the vessels when raised.

The lifting dock is about 320 feet long, 64 feet broad, and about 30 feet deep. Along each side of it, but below the level of the water, are fixed thirty-two 10-inch hydraulic rams, which are probably the longest apparatus of the kind in the world, being nearly 30 feet long, and having a stroke of 25 feet. These are properly set and secured in solid masses of masonry, to resist the tremendous pressure which is

brought to bear on their foundations when the apparatus is in action. To the head of each of the pistons of these rams is attached a strong wrought-iron cross-head. Fastened to each pair of hydraulic rams, and extending across the docks, are massive trussed iron girders, weighing upwards of 60 tons each, and capable of sustaining a weight of nearly 300 tons. There are thus sixteen of these iron girders, traversing the dock from side to side, at distances of 20 feet apart, forming a gigantic framework, capable of sustaining a weight of nearly 4,000 tons, or far greater than that of the ordinary run of large first-class ships. To avoid the risk of the rams breaking (which would be a very considerable one, owing to their unusual length and the great weight they have to support when in use) the cross-heads to which the iron girders are attached run in massive cast-iron guides, which rise some 28 feet above the water.

The iron pontoons which are used for floating the ships after they are lifted, and during their repair, are to be eight in number, all 60 feet broad, and varying in length from 240 to over 300 feet. At present, however, there is only one in use and another approaching completion, both of which are of the minimum length of 240 feet. They are constructed of boiler-plate iron, strengthened, of course, with stout wrought iron girders, secured transversely across the pontoon, at intervals of three or four feet. They are extremely light, weighing altogether little more than 300 tons, though the great surface which they present to the water (14,400 superficial feet) enables them to support a weight of 2,000 tons, with an immersion of little over 4 feet. At one end of each of these pontoons is placed a large valve which, opening and shutting with a kind of screw break, can be sunk or rendered watertight in a very few minutes.

The *modus operandi* of lifting a vessel is as follows. The iron pontoon is first moored over the lifting dock, the valves are opened, and it is allowed to sink until it rests upon the iron girders attached to the rams. The ship to be docked in then moored immediately over the pontoon, and the force-pumps worked until the keel rests upon the pontoon. The wooden dogs which are fixed so as to slide backwards and forwards on the floor of the float are then, by means of ropes, drawn under the sides of the vessel, so as to support her in an upright position and prevent her from "canting over" when she is raised out of the water. When all these preliminaries (which in their performance do not occupy much more time than that taken to describe them) have been properly adjusted, the hydraulic pumps are again set to work, and the whole apparatus, pontoon, ship, and all, is fairly raised out of the water. When all the water has discharged itself through the valves in the bottom of the pontoon, they are firmly closed watertight by means of the vulcanised indiarubber seams, and the water being allowed to escape from the hydraulic cylinders, the rams, with their attached girders, sink down, leaving the pontoon floating with the vessel in it high and dry.

The whole operation, from the very commencement, does not occupy more than one hour or so. If the object of docking the ship be

merely to examine the bottom or to execute some slight repair, which will occupy but a few hours, the pontoon with the vessel is not moved from the lifting dock; but should the necessary repairs be of such a nature as to occupy any length of time, it is towed away into one of the eight shallow docks built for the purpose, the depth of water in which varies, according to the tide, from six to eight feet. When the scheme is fully carried out, it is intended to have regularly fitted workshops placed on the banks of each of these pontoon basins for the repair of both steam and sailing ships constructed of either iron or timber.

When it is wished to float a ship again, the pontoon is moored in the lifting dock, and the girders are raised up sufficiently high just to take the weight of the ship off the pontoon. The valves of the latter are then opened, and at the same time water is allowed to escape from the hydraulic cylinders, so that the whole apparatus quickly sinks, effectually launching the ship again in about ten minutes.

The great advantages attendant upon having a simple and efficacious apparatus of this kind in connexion with a large dock company, are too manifest to require comment. By it the expense of docking a ship is much reduced, and at the same time infinitely greater facilities are afforded for the performance of the operation, and the time occupied by it reduced in a most important degree. Should it become necessary to dock a ship just as she is preparing to sail (as is very frequently the case), the operation can now be immediately performed in less than two hours, in any state of the tide, and without there being any necessity to discharge the cargo. If the necessary repairs were of a trifling nature, the ship might again be launched and pursuing her course down the Thames within four or five hours.

The hydraulic pumps and rams connected with the "lift" are of course the most important and interesting parts of this gigantic apparatus. They are worked by a 50-horse power, combined high and low pressure engine. The water is pumped from the engine-house through one common pipe to a reservoir in the valve-room (where all the tubes through which the hydraulic cylinders are supplied concentrate) at a pressure of about a ton to the circular metre. The valves in this room are so arranged that the rams may be made to act together in sets of six, or each may be put into action perfectly independent of the others. These complicated series of valves are, during the operation of lifting, under the charge of a competent engineer, who, by increasing or diminishing the action of each pair or series of rams, can cause the ship to be raised either perfectly perpendicular or in any other desired position.

It has been said that the water is pumped into the hydraulic cylinder at a pressure of one ton to the circular inch, which gives a lifting force with the whole 32 10-inch rams of 3,200 tons. This is the ordinary working pressure when ordinary ships of less than 2,800 tons weight have to be raised. But with heavy laden vessels a much greater force would be required. The moveable portions of the pistons of the rams, together with the cross heads, iron girders, &c., weigh

about 1,100 tons, and the iron portion about 300 tons more; but as about 1,000 tons of this iron work is never raised above the water, 100 tons must be deducted from this for displacement. Thus about 1,300 tons of the ordinary working force of 3,200 tons is consumed in raising the apparatus itself, leaving only 2,900 tons for the weight of the ship.

As none of the pontoons yet constructed will carry more than about 2,000 tons the ordinary force is sufficient. But should it at any future time be deemed necessary to raise a ship and cargo of greater weight, the rams would easily bear a pressure of two tons to the circular inch, which, supposing the rest of the apparatus would resist such a strain, would give an available lifting power of about 5,000 tons. This invention is doubtless only the precursor of great and sweeping changes in the method of both launching and docking ships to be effected through the agency of the hydraulic ram, which supplies us with such a ready and efficacious means of concentrating mechanical power.

Daily News.

Rifle Cannon.

Advance in the destructive art of war seems far to outstrip the power of defence. In nothing is this more marked than in the perfection of the rifle. The rifleman is now possessed of a weapon which enables him with little difficulty to strike an enemy if near enough to be seen by ordinary vision.

In this way the art of war seemed destined to have changed; it became doubtful whether artillery even could maintain its effectiveness as a principal arm of warfare. Of what use heavy guns in the field, if the gunners could be coolly picked off by the riflemen long before they could bring their cannon into range of their adversaries? The Minié bullet in this way became more than a match for the nine or eighteen pounder shot. Artillery officers in vain strove to improve their cannon by increasing their size, weight of shot, and altering their form. Much was done, but still the lighter arm of the rifle kept far in advance, for effective service, of the cannon,

At first sight it seems easy enough to point out the road for improvement. Why not follow the same principle with the cannon which had been so successfully adopted with the musket? What converted old Brown Bess into the deadly rifle? The rifle carries farther than the smooth bore musket, and delivers its ball with surer aim. These two important conditions were obtained by the application of very simple means. In the common musket there was great waste of the propelling force. The ball did not fit closely the bore, consequently when the charge was ignited a considerable portion of the elastic vapour, generated by its explosion, escaped between the

bore of the musket and the bullet, producing what is called *windage.* This could be avoided by making the bullet fit so tightly as to allow of little or no escape. By preventing windage the same amount of powder would send the ball a greater distance. When distance, however, was increased, an evil was increased in rapid proportion to the increase of range. The ball was projected wide of the mark in spite of the steadiest aim.

No bullet is perfectly dense throughout, and if it were so, the most minute prominence on any part of its surface, or the slightest irregularity of smoothness in the bore of the gun through which it had been impelled by the explosion, would set up a spinning motion in the ball, as well as its direct motion to the mark at which it was aimed. If this spinning motion was in any different direction than round the direct path the ball was intended to take, the consequence would be a diversion from the line of aim—a diversion increasing with the distance. To remedy both windage and divergence the rifled barrel was contrived. One or more grooves were made in the interior of the barrel, twisting round it. The leaden ball had either protuberances to fit the grooves, or else, being a little larger than the bore, and being of a soft nature, it was hammered or forced into the grooves, so as to fit the barrel and its grooves tightly. The twist was not greater than necessary to give a complete turn to the bullet once round while it was passing through the barrel. By this ingenious contrivance the spinning motion of the ball was made in the direction of the line of aim. Any tendency to diverge in one direction from the irregular density of the ball was counteracted by an opposite tendency of divergence, as the ball spun round the line of its direct flight. Thus divergence was prevented, and security of aim ensured within the range of the ball. When the bullet was driven into the grooves so as to fit the rifled barrel completely, windage was prevented and superiority of aim was combined with increase of range.

These advantage were obtained at the expense of speed in loading. The operation of forcing in the ball was tedious and laborious. To obviate this difficulty, a very important one in warlike operations, Mr. Greener, so long ago as 1836, produced a bullet on what he termed the expansive principle. Instead of making the bullet perfectly spherical he made it oblong in shape, having a perforation extending through two-thirds of its length. In this was fitted an iron plug of a conical shape. The ball was made of such a diameter as to be forced as readily to the breech of the rifle as an ordinary bullet to that of the musket. When explosion took place, the iron plug being driven into the leaden bullet, expanded its sides so as to drive them into the grooves of the rifle. Thus all the advantages of the rifle were obtained with the same facility of loading as in the ordinary musket.

Successful experiments were made. The principle was taken up, and successfully developed in France by Colonel Minié. Our Government were startled into something like activity by the reports of the splendid practice of the French riflemen. This, combined with

the disgrace of being worsted by such contemptible foes as Afighans and Caffres, led us to borrow from the French the adaptation of a principle we had neglected when enforced and perfected by one of our own countrymen. Experience has confirmed the value of the expansion principle, though it has been found expedient to substitute boxwood for the iron plug.

Rifled small arms having made this rapid stride towards perfection in a few years, the attention of all improvers was directed to larger ordnance. Great difficulties were found, both in rifling the cannon and in adapting the expansive principle to cannon shot. The Lancaster gun, with its oval bore and wrought iron shot, proved an expensive failure. Mr. W. Armstrong, a civil engineer, not a professed artilleryman, seems now to have solved the problem, and raised the larger ordnance to its previous pre-eminence over the smaller arm. He makes his gun of steel and wrought iron. Internally steel, it is surrounded externally by wrought iron, twisted in a spiral form, as in a musket or fowling-piece. The strength and tenacity of this combination, as compared with gun-metal or wrought iron, enables Mr. Armstrong's gun to project an 18-pounder shot with a cannon weighing no more than an ordinary 9-pounder. The interior of the bore is rifled with small grooves, about forty in number, making a complete twist as they pass from one end to the other of the cannon. The ball is of cast iron; it is cylindrical in shape, terminated by a rounded head. The greater part of the surface is coated with lead, securely prevented from being driven off the shot in its progress through the barrel. This leaden coat makes the shot a little larger than the bore of the cannon. Mr. Armstrong's gun is loaded at the breech, and the shot being propelled through the bore by the explosion of the powder, the lead in its expansion tightly fits the grooves, and the necessary spinning motion is given in the right direction. The advantages gained by this improvement can only be estimated by a consideration of the results obtained.

At the experimental trials at Shoeburyness an 18-pounder shot was made over and over again, with the greatest ease and certainty, to strike a six feet target at a distance of 3,500 yards. This is only 20 yards less than two miles. This sets at rest the question both of accuracy and length of range. The cylindrical shot with rounded head, when made to revolve in the right direction, suffers far less obstruction from the resistance of the air in its speedy flight than a spherical shot of the same weight. Mr. Armstrong's shot can be made into a shell, and of all shells the most destructive, a percussion one. It contains a small cavity in its centre. When this is filled with bursting powder, and a detonating fuse is inserted in front, the instant the shot strikes an object the detonating powder explodes and fires the fuse. A minute space of time, sufficient, however. to allow the shell to travel four or five feet, takes place before the bursting powder is ignited and the shell explodes. Thus the shell may penetrate the side of a ship entire, and then bursting, scatter its deadly fragments in the

midst of the crowded deck. When used simply as a shot, a head of iron or steel is substituted for the fuse. The penetrating character of the new missile may be judged from the following facts:—A five-pound shot fired at a timber target three feet thick, composed of six layers of rock elm bolted together so as to form a solid block, passed entirely through it when fired from a distance of 1,500 yards. A 12-poud shot at Shoeburyness fired at 800 yards distance perforated a solid body of oak timber nine feet thick.

The havoc made in the iron sides and ribs of the *Trusty*, floating battery, by one of Mr. Armstrong's 32-pound shot has been recorded. At a range of 400 yards the steel-headed shot "drove in a portion of one of the plates, went through the side, tearing away one of the beams, deck, &c., and passed out over the upper deck." With such deadly flying steel-headed iron rams as Mr. Armstrong has invented, and with the improved cannon for projecting them, we need fear no floating rams nor iron mailed batteries.

TYPHOON IN THE CHINA SEA.

H.M.S. Niger, Hongkong, November 27th, 1858.

Sir,—I beg to forward for your information, in the hope that it may be acceptable, an account of the weather experienced by the P. & O. C. steamer *Pekin*, (on board which ship I was a passenger,) on her last passage up the China Sea, during which she narrowly escaped the vortex of a typhoon. I may add, that Captain Burne in laying to until the vortex had passed the course he intended to steer, showed his thorough knowledge of the principles which appear to govern the movements of these storms, and has afforded a practical illustration to his brother seamen of the advantages of studying the STORM COMPASS attached to your valuable little work the *Seaman's Hurricane Companion*.

I have, &c.,

P. CRACROFT.

To the Editor of the Nautical Magazine.

The *Pekin* left Sincapore at 4h. p.m. on Saturday, the 30th of October, with the mails and passengers for Hongkong, and passed Pedra Branca (the Horsburgh Light) at 7.15 the same evening. Everything had been made snug in anticipation of meeting the N.E. monsoon, which usually commences about this period, and it was the intention of Capt. Burne, had it made very strong, to steer for the Palawan; but the wind veered to the westward, so a course was shaped direct up the China Sea. Nothing particular occurred till off Pulo Sapata, when a very heavy swell was encountered, and the weather looked threatening; but as the barometer kept up, no great change

was apprehended. The following is an extract from the log, commencing on Friday, November the 5th, at noon.

Lat. 13° 56′ N., long. by chron. 114° 29′, course N. ¼ E., knots 6, 4 fathoms, wind W.N.W.,; at 4h. p.m. bar. 29·81, ther. 81°, 11¼ revolutions per minute, Mau-Mee-Chow N. 4° W., 474 miles. Sent up fore yard; bent and set foresail. Strong wind with heavy confused sea, cross swell and frequent hard squalls with rain; ship labouring heavily, and taking in water over all. 4h, same wind, weather, and sea. 5h. crossed fore topsail yard, close reefed sail and set it. 7h. 7 knots. At 8h. bar. 29·85, ther. 81°, 11½ revolutions per minute. Strong wind and hard squalls; sea from N.W.; swell from northward and eastward. 10h. wind W.b.N. Midnight, bar. 29·84, ther. 81°, 11½ revolutions per minute. Same wind and weather; very heavy squalls; ship labouring a good deal, shipping water over all.

Saturday, 6th. At 1h. a.m., course N. ¼ E., 7 knots, wind westerly, bar. 29·80. Very strong breeze with occasional hard squalls, and small rain. Dark cloudy weather all round. High confused sea from N.W., with long swell, crossing it, from North-eastward. 2h. wind W.b.S., bar. 29·75. Wind increasing, with hard gusts. Barometer falling steadily. 3h. bar. 29·73. Occasional flashes of sheet lightning to the N.W.b.N. Weather looking heavier and darker; wind and sea increasing. 3.15, turned all hands out, and took in the foresail, securing it with double gasketts. 4h. bar. surf. conv. 29·72, ther. 80°. Same weather. Took in and stowed the fore top staysail, double reefed the fore trysail. 5h. 8 knots, bar. oscillating between 29·72 and 29·75.

Daylight discovered the most sinister and threatening appearances in the weather; clouds dark and heavy, and banked up all round, with flying ragged edges, and charged with rain, streakyscud mist overhead, and the whole atmosphere, clouds, and sky gleaming with a livid lurid glare, which was heightened by the increasing light into a kind of fiery brickdust-red-and-yellow tinge, and then subsided to a general ashen and lead colour. Wind rising fast, with a *moaning* blast as it rose. Took in fore topsail and secured it with double gasketts. Battened all hatches, scuttles, &c. down, and secured everything about the decks. Boats (four of them) already in board on quarter deck. 6h. 7 knots, wind West, bar. 29·75 to 29·72. 7h. knots 6, fathoms 4, bar. 29·75. Wind veering to northward considered that it formed the southern South-western verge of a cyclone, which having already traversed the sea from the eastward in somewhere about the parallel of 10° N. lat. and this caused the high and confused sea and cross swell which we have experienced during the past few days,—had recurved and was now passing ahead of us to the eastward. The centre—having borne North—at six o'clock, towards which our course was thus bringing us nearer, and as confirmed by the increasing strength of the wind, accordingly eased engines, so as to allow the centre to pass without our approaching nearer to it, and yet preserve a steerage way, and

hauled the ship a point to the northward, sea running very high and ship pitching heavily. Hooked on and manned relieving tackles; ship bowing the sea well. Strong gale now blowing with hard gusts and thick small rain. Ship labouring much and the sea striking heavily under the sponsons. Rove four heavy luff tackles, and hooked them on to chain slings round the funnels, two to each, and set them up as preventer stays. Spread half quarter deck awning, lashing it down to the rail in the side as shelter for the passengers. Wind gradually veering to northward, showing that we were in the S.W. quadrant of the retrograde cyclone, and that its centre was passing to the eastward and away from us. 8h. course N.b.W., knot 1, wind W.b.N., bar. surf. conv. 29·75, ther. 80°. 9h. knots 2, bar. 29·75. 10h. wind W.N.W., bar. 29·74, ther. 79°. 11h. bar. 29·73. Noon, knot 1, fathoms 6, wind N.W. ½ W., bar. 29·74, ther. 79°. Same weather with less hard gusts. Engines going full power since 9·30 a.m.

Course made by account N. 12° E., distance made 140 miles, lat. 16° 14′ N., long. by acc. 114° 58′ E. var. 6° E.

1h. p.m., course N.b.W., knots 3, wind N.W.b.N. Strong gale and very heavy sea. Carried away one of the tiller blocks; replaced it. 2h. ship pitching heavily and taking in seas over the forecastle. 4h., bar. 29·76, ther. 79. Weather the same. Set double reefed fore trysail,—in ditto. 6h. bar. 29·78. Very heavy squalls with high sea. Shipped a very heavy sea. A great quantity of water in fore saloon. 7h. squalls less frequent and moderating. 8h. knots 3, fathoms 4, bar. 29·80, ther. 78°, 9 revolutions per minute. Weather more moderate. Sea less high, but confused. Hands at the relieving tackles. 9h., course N. ¾ W., knots 4. Midnight, bar. 29·88, ther. 77°, 9 revolutions per minute. Strong wind with frequent lulls. Ship taking much water over all. Sea more confused. Ship labouring very much. Sky clearer.

From this period the weather gradually improved, the wind drew round and settled in the N.E., and on the 9th at 10h. a.m. the *Pekin* arrived at Hongkong, and I was thankful to reach the end of the miscalled "*overland*" journey. We had the usual "equinoctial" in the "Bay," a levanter in the Mediterranean, and a typhoon in the China Sea,—quite enough for one trip.

[We are inclined to think that this was no retrograde movement of the great whirlwind,—the vessel having altered her course westerly would make it appear that it was travelling eastward. The *Storm Compass* alluded to is published by Potter, and has been distinguished by being translated into Spanish, as noticed in a former number.—ED.]

The Tide of Fortune.

Another illustration of Shakespeare's lines,—"There is a tide in the affairs of man," &c., found in a Sandwich Islands paper wearing the garb of fact.

One little act of politeness will sometimes pave the way to fortune and preferment. The following sketch illustrates this fact:—

A sailor, roughly garbed, was sauntering through the streets of New Orleans, then in a rather damp condition from recent rain and the rise of the tide. Turning the corner of a much frequented alley, he observed a young lady standing in perplexity, apparently measuring the depth of the muddy water between her and the opposite side-walk, with no very satisfied countenance.

The sailor paused, for he was a great admirer of beauty, and certainly the fair face that peeped out from under the little chip hat, and the auburn curls hanging glossy and unconfined over her muslin dress, might tempt a curious or admiring glance. Perplexed, the lady put forth one little foot, when the gallant sailor with characteristic impulsiveness exclaimed,—

"That pretty foot, lady, should not be soiled with the filth of this lane; wait for a moment only, and I will make you a path."

So springing past her into a carpenter's shop opposite, he bargained for a plank board that stood in the doorway, and coming back to the smiling girl, who was just coquettish enough to accept the services of the handsome young sailor, he bridged the narrow black stream, and she tripped across with a merry "thank you," and a roguish smile, making her eyes as dazzling as they could be.

Alas, our young sailor was perfectly charmed. What else would make him catch up and shoulder the plank, and follow the little witch through the streets to her home; she twice performed the ceremony of "walking the plank," and each time thanking him with one of her eloquent smiles. Presently our young hero saw the young lady trip up the marble steps of a palace of a house, and disappear within its rosewood entrance; for a full moment he stood looking at the door, and then with a wonderful big sigh turned away, disposed of his draw bridge, and wended his path back to his ship.

The next day he was astonished with an order of promotion from the captain. Poor Jack was speechless with amazement; he had not dreamed of being exalted to the dignity of a second mate's office on board one of the most splendid ships that sailed out of the port of New Orleans. He knew he was competent, for instead of spending his money for amusements, visiting theatres and bowling-alleys on his return from sea, he purchased books and became quite a student; but he expected years to intervene before his ambitious hopes would be realized.

His superior officers seemed to look upon him with considerable leniency, and gave him many a fair opportunity to gather maritime knowledge; and in a year the handsome, gentlemanly, young mate

had acquired unusual favour in the eyes of the portly commander, Capt. Hume, who had first taken the smart little black-eyed fellow, with his neat tarpaulin and tidy bundle, as cabin boy.

One night the young man, with all the officers, was invited to an entertainment at the captain's house. He went, and to his astonishment mounted the identical steps that had two years before the brightest vision he had ever seen; a vision he had never forgotten. Thump, thump, went his brave heart, as he was ushered into the great parlour; and like a sledge hammer it beat again, when Capt. Hume introduced his blue-eyed daughter, with a pleasant smile, as "the young lady once indebted to your politeness for a safe and dry walk home." His eyes were all a blaze, and his brown cheeks flushed hotly, as the noble captain sauntered away, leaving fair Grace Hume at his side. And in all that assembly was not so handsome a couple as the gallant sailor and the "pretty ladie."

It was only a year from that time that the second mate trod the quarter-deck, second only in command, and part owner with the captain, not only in his vessel, but in the affections of his daughter, gentle Grace Hume, who had always cherished respect, to say nothing of love, for the bright-eyed sailor.

His homely but earnest act of politeness toward his child had pleased the Captain, and, though the youth knew it not, was the cause of his first promotion. So that now the old man has retired from business, Harry Wells is Captain Wells, and Grace Hume is, according to polite parlance, Mrs. Captain Wells. In fact, our honest sailor is one of the richest men in the Crescent City, and he owes, perhaps, the greater part of his prosperity to his tact and politeness in crossing the street.

Deep Soundings in the Pacific.

[The following extract from a Sandwich Island paper will show that the United States officers, who took the lead in sounding the Atlantic Ocean, are doing the same in the Pacific; a course prophetic of an important future on their gradually increasing western border.]

The schooner *Fenimore Cooper*, which arrived on Tuesday, left San Francisco on the 26th of September, having been sent out by order of the United States Navy department to survey the route to China from San Francisco. Her officers are Lieut. Commanding John M. Brooke, Lieut. Charles E. Thorburn, and Mr. Kern, draughtsman. Lieut. Brooke will be remembered by our readers as the inventor of the deep sea sounding apparatus, through the means of which the telegraph plateau across the Atlantic was mapped out by Lieut. Maury, a knowledge of which has led to the successful laying of the Atlantic telegraph. Lieut. Thorburn was a member of the commission which

surveyed the overland route between San Antonio and San Diego, in which he acquired a high reputation as a scientific officer. Mr. Kern accompanied Fremont in his celebrated journey to California over the Rocky Mountains, in which the party suffered so much. Kern River was discovered by this gentleman, and subsequently received his name.

The object of the present expedition is to prove or disprove the dangers which have for years been represented on the charts as existing on the route between San Francisco and China, with a view to the establishment, at no distant day, of a line of steamers to the "farthest West," from the present western emporium of American commerce, in connection with that stupendous undertaking, the Pacific Railroad, the accomplishment of which the people of the United States are now determined upon. It is proposed by this expedition to examine carefully the track throughout, not only for one terminus, but through the Ladrone Islands and among the islands to the southward of Japan. The *Fenimore Cooper* has examined the reputed dangers—islands and shoals—on the route between San Francisco and Honolulu, and finds that none of them exists. The great depth of water in the vicinity where shoals have been reported, precludes the possibility of their existence. The spot represented on the charts as Cooper Island, was repeatedly sailed over, and each sounding gave *three miles* depth of water. We may here mention that Lieut. Brooke is furnished with *seventeen* chronometers, by well known makers, and he not only rates them in the ordinary manner, but, in accordance with a plan which we believe he was the first to put in practice, the effect of a change of temperature is strictly marked upon each of these seventeen instruments. This, we are told, amounts to as much as a difference in the rate of two seconds or more, according to the difference of temperature, which every navigator knows must render this an important subject of scientific inquiry.

Lieut. Brooke, as we before remarked, made a number of deep-sea soundings on the way from San Francisco to Honolulu, not only in the usual and straightest route, but often going far out of his way to examine the fabulous shoals and islands referred to, and the least water found was two miles in depth. This, Lieut. Brooke thinks, is an elevation or submarine ridge of mountains, about midway between these islands and the coast. The deposit brought up by the sounding tube was of a dark earth colour, and when examined through a microscope, proved to be composed of innumerable *infusoria* or microscopic animals. To the naked eye it resembles the mud deposited by an overflow of a river.

The apparatus for sounding (which is one of the most ingenious contrivances, and yet quite simple to the comprehension when explained) not only brings up a specimen of the substance of which the bottom is composed, but there is found in the top of the tube some of the water, which, stagnant and waveless, for one hundred fathoms from the bottom of the Pacific, protects those minute creatures from

the influence of the upper currents and storms. Man's inquisitive search has at length found out their abode, and they may ere long receive in their quiet depths the continuation of the earth's girdle, which Puck boasted of but realized not. We may yet live to see the Pacific telegraph cable laid. This deep sea water is excessively salt, as clear as crystal, but destitute of the bitter taste of the surface water. The soundings from the coast were quite uniform, indicating a level plain or plateau, of the depth of three miles, until near midway, when the depth gradually decreased for a mile, and on this side as gradually increased to the same depth as before, which was maintained to the islands.

It is the opinion of the officers of the *Cooper* that these islands rise very abruptly from deep water, and that a depth of two miles will be found within a short distance of Hawaii. The channels between the islands, too, have the appearance of being very deep. No opportunity was afforded to obtain soundings about our group before coming into port, but it is intended to obtain them when the vessel proceeds to sea. The *Cooper* will remain here two or three weeks, and will proceed westward on the usual route of vessels bound to China, touching at Guam and Japan, and thence to Hong Kong.

THE INDUS STEAM FLOTILLA.

For the benefit of those who are not disposed to face a cutting wind, or the proverbial fragrance of the Thames, the *Homeward Mail* gives the following particulars regarding the new experimental vessel for the Indus.

The card tells us that its length is 200 feet, its breadth 38, its draught of water 1 foot 10 inches, its speed as a passenger boat 13 miles per hour, and with 500 tons cargo in tow, 8 miles per hour. To these statements we will add, that the first impression received on seeing it is, in contradiction of the proverb, also the true one, that it is peculiarly a surface boat. It gives the idea at once, not of skimming—it is not airy enough for that—but of gliding, of capability for slipping over those innumerable sand-banks which render the navigation of the Indus so difficult. In steamers of the old build it was not a very pleasant thing when descending the Indus in full flood at the rate of some eighteen miles an hour, to impinge on one of these banks. The vessel seemed about to bury itself altogether, and generally lodged with such force that weary hours were spent ere it could be got off. This difficulty may be said to have ceased to reign, for but few banks approach so close to the surface as 24 inches, and the experimental vessel is so constructed that each wheel may be detached, so as to work off with the other. As a passenger boat, the

new steamer presents extraordinary advantages. The cabins are unusually lofty, not much short indeed of eight feet high, with ventilators and venetians in all directions. Around them and completely round the vessel, is a wide promenade like a verandah, and on the roof of the cabins another, above which will be an awning. Contrary to the usual custom, the fore part of the vessel is appropriated to Europeans, and the stern to natives, as the fore part will, of course, be the cooler and more easily ventilated. Natives, it may be fairly supposed, are less incommoded by heat than Europeans, and there is another reason for this arrangement, which we leave to the subtle perception of all who have travelled in the East. There are separate cabins for females, both in the fore and stern part, and the requirements of the Pardah may be as much observed on board as on shore by those who stickle for them. In the matter of ventilation we have nothing to suggest, but as the intense heat of Scinde is really the most formidable obstacle to travelling in that province, it would seem advisable to contrive some means of cooling the roof of the vessel. Awnings are but a feeble shield against the rays of such a sun, and the roof will become so heated in the day as to radiate heat even at night, unless water can by some means be interposed. This might be done perhaps by giving a deep rim to the roof, and a metallic covering, in which case there might be a second roof at intervals of three or four inches. The vessel is constructed of iron, with a teak deck. At present the deck is not of sufficient strength to bear guns, but this defect may easily be remedied, and as attention has been drawn to the point by Lord Stanley, no doubt the alteration will be made.

Nautical Notices.

Reported Danger off Swatow,—*China.*

There may be something in this, but the bearings are unsatisfactory, probably from misprinting. But we preserve it as it appears in the *Hongkong Register* of the 16th of November, in the hope that its true position, if a danger, may be yet brought to light.

Ship John Ritson, Swatow.

Sir,—For the safety of the numerous ships and lives that are going to and from this place, will you kindly make public the following report.

At 7h. a.m., Oct. 27th, ship, drawing thirteen feet water, grated over a rock with her port bilge. The ship's headway was not stopped, although going only two knots. The lead, kept going, had regular soundings of six to five fathoms; steering W.¼N. had still five fathoms on the starboard side. The shock was so unexpected and momentary that I thought it caused by an earthquake, but, nothing of the kind being felt here, I judge it to be rock or shoal, with twelve or thirteen feet at half ebb.

The following are the bearings taken immediately:—Cape of Good Hope,

S.¾W.; Double Island, W.b.N.¼N.; Pagoda, W.b.N.¼W.; the Cone Islet, W.S.W.¼S. Near this position the rock or shoal will be found. Two ships at anchor off Double Island were in sight, and a pilot boarded the ship one mile from the spot.

Yours truly,

THOMAS MATCHES.

Master of ship John Ritson, of Sunderland.

To the Editor of the Hongkong Register.

P.S.—Since writing the foregoing I have seen Captain Sullivan, who tells me that a wreck was seen near the place which the bearings would give, and that she may have been driven to where my ship struck. I think it must have been the wreck, but, whatever it may be, it is sufficiently dangerous to warn shipmasters to avoid the spot.—T. M.

PARTICULARS OF LIGHTS RECENTLY ESTABLISHED.

(Continued from page. 51.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
1858.						
80. Domesness Reef	Gulf of Riga N.W. point	Baltic	..	..	..	Light-vessel. Carries a flag by day with blue cross.
Seskar	N.E. point, 60° 0·1′ N., 28° 23′ E.	Gulf of Finland	Ff.	97	15	Est. 5th Oct., '58. Seen bearing N.b.E.¾E. round southward to N.N.W.¼W.
85. Messina	.....	.....	..	..	..	In Notice No. 65, of 1858, this light is stated to be *white*. It is found to be *red*.
Missolonghi	West of entr. to Lake, 38°19·5′N., 21°23·3′E.	Gulf of Patras, North side	F.	..	10	Not said.
Patras *(a.)*	Mole-head	Town	..	..	..	Est. —. Red, and difficult to discover.
86. Cherrystone Inlet	37° 15·5′ N., 76° 3′ W.	Chesapeake Bay, U.S.	F.	36	10	Est. 1st Jan., '59. On screw piles.
Stingray Pt.	37° 33·5′ N., 76°16·7′W.	Ditto	F.	..	7	Est. 1st Jan., 59. On screw piles. For entrance of Rappahannock River.
1859.						
1. Needles Rock	Entrance	Isle of Wight	F.	..	14	Est. 1st Jan., '59. A red and white light. At the tower screened. *Red* from S.E.b.E. to West. *Bright* from West to W.N.W. *Red* from W.N.W. to N.E.b.E.½E. Bright from N.E.b.E.½E. to N.E.b.E From N.E.b.E. to S.E.b.E. screened towards the island.

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

(a.)—Mole at Katakolo.—Also, that a mole has recently been constructed at the village of Katakolo, in Katakolo bay, on the eastern side of the cape of the same name, West coast of the Morea.

The mole is well built, and extends 210 yards in an E.b.N. direction, to a depth of five fathoms, and affords shelter within to vessels up to 500 tons burthen. Vessels generally lay a bwoer anchor to the northward, and moor astern to stone bollards on the mole. A smaller mole or quay, for landing

cargoes from boats, projects from the village of Katakolo at a quarter of a mile farther to the northward.

It is intended to place a floating light at the eastern end of the Shambles Shoal, off Portland, to enable vessels to haul round her when making for the refuge harbour in Portland Bay.

A BEACON FOR DARTMOUTH HARBOUR.—Under the foregoing title we find in the *Shipping Gazette* notice of a meeting at Dartmouth to attain that object, one essential towards making that place more conspicuous and readily observable from sea. For our own part we have always considered Dartmouth as an important place and one which might be made very much more so. What is really wanted besides a good beacon is some attention to improving the lights as well as some operations at the entrance in removing a dangerous rock lying in the way, nothing altogether of a very costly nature. We hope from what has taken place that Dartmouth will put her own shoulder to the wheel, for they are the people who will benefit by such improvement. Like the East coast, which has no harbour between the Forth and the Humber, so has the South coast no harbour to be compared with Dartmouth between the Thames and the Land's End. We hope Dartmouth will not be idle. But more about this in our next number.

CHARTS *Published and Corrected by the Hydrographic Office, Admiralty, in January*, 1859.

Scotland, West Coast, Lochs Torridon and Shieldag, Capt. Otter, R.N., (3s.)
Scotland, West Coast, Lochs Carron and Kishorn, Capt. Otter, R.N., (3s.)
Nova Scotia, Ship Harbour, Capt. Bayfield, R.N., 1854, (3s.)
Cochin China, Sheet 1, Gulf of Siam to Nhatrang, corrected by J. Richards, Esq., R.N., 1858, (2s.)
British North American Lights, corrected by Commander Dunsterville, R.N., to January, 1859, (6d.)
West India Lights, corrected by Commander Dunsterville, R.N., to January, 1859, (6d.)
South America and West Coast of North America Lights, corrected by Commander Dunsterville to February, 1859, (6d.)
H. O. Notice, No. 1, East Coast of Newfoundland (Trinity Bay), Capt. H. C. Otter, R.N., 1858, (3d.)
H. O. Notice, No. 2, China Sea and East Coast of China Shoals, Lieut. C. J. Bullock, R.N., 1858, (3d.)
H. O., Admiralty, 21st January, 1859.

FANNING ISLAND.—The brig *Emma*, Capt. Zenas Bent, which left here under charter for Fanning Island last July, returned on Saturday last with about 80 tons cocoanut oil, all which was pressed in about two months time. Fanning Island Harbour is in lat. 3° 49′ N. and long. 159° 20′ W., and is on one

of the many circular islands which abound in the Pacific Ocean. It produces little else than cocoanuts, of which there are an abundance, and the settlers are constantly planting more. About a year ago the *manienie* grass of these islands was introduced there, and grows well. Capt. Bent left on the island six cows and a bull, and a few sheep, which it is thought will prove of great use to the settlers. Mr. Henry English is the proprietor, and, with his few white companions and one hundred and fifty natives from a neighbouring island, may be considered as possessed of quite a pretty property. At the prices realized from the last lot of oil brought from Fanning Island,—50 cents per gallon,—the present cargo of the *Emma* is worth about 10,000 dollars; besides which she took to Tahiti for sale there some 40 tons. The British flag, we understand, has been raised on Fanning Island, a formal possession having been taken by the British authorities. Capt. English owns the island, having purchased it from the previous owners, and the protectorate of the English flag gives additional guarantee to his rights.

Sandwich Island Paper.

Sayings and Doings.

The last China mail brings us the news that the United States merchants have shipped a large quantity of sugar to Nicolaleff, on the Amoor, for the purpose of transport to Tartary and Siberia. This event has had such an effect that at the fair of Novgorod the price of sugars fell 30 per cent. The Americans hope to extend this trade through the frontier provinces of China, Mongolia and South Siberia.

The Mediterranean Extension Telegraph Company have received a telegram from their superintendent at Malta to the effect that on the arrival of the steamer *Elba* operations were commenced by underrunning the cable, in the course of which an "entanglement" was met with off the Bay of Malta. Owing to a gale of wind, however, operations were for the time suspended. In the event of no further impediment having occurred, it is probable that telegraphic communication between Malta and Cagliari will soon be resumed.

The length of cable for the Indian telegraph from Suez to Aden, manufactured by Messrs. Newall and Co., will be despatched from Liverpool shortly, in two vessels.

Lieutenant W. Rodger, R.N., has been promoted from the reserved list of lieutenants to the reserved list of commanders under an order in council, in recognition of his valuable services to the royal navy, as well as to the mercantile marine of the country, by improvements which he has made in the various kinds of anchors.

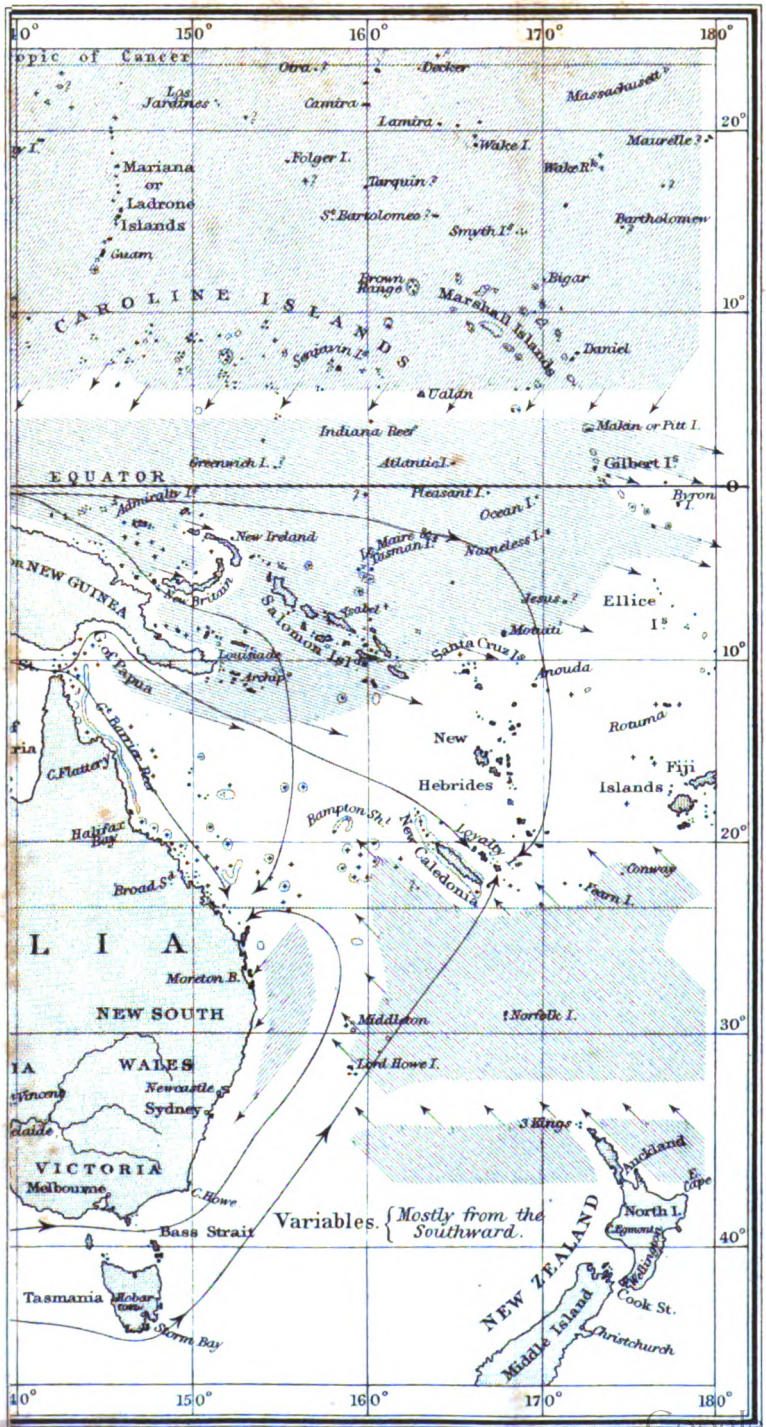
TO CORRESPONDENTS.

MOULMEIN.—Your paper received, and request shall be complied with. Thanks.

SINGAPORE TO NEW CALEDONIA AND N.E. AUSTRALIA.—Received with thanks.

So much important matter has filled our present number that we are compelled to reserve some notices of books for our next.

R(CALEDONIA FROM NOVEMBER TO MARCH INCLUSIVE.



Malby & Sons, Lith.

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

MARCH, 1859.

Notes on the Routes from Singapore to New Caledonia and the North-East Coast of Australia, from November to March, inclusive.

Southern Route.

Vessels bound to the south-eastern colonies of Australia almost invariably adopt the Southern Route at all seasons of the year, entering the Indian Ocean by the Strait of Sunda. The passage to Sydney, under very favourable circumstances, has been made in seven weeks, and that to Melbourne in a few days less; but the average is between nine and ten weeks. The passage to Port Curtis or New Caledonia will occupy ten days or a fortnight more, if no intermediate port is touched at. None but staunch and well-found vessels should attempt the passage.

Vessels leaving this port during the season from November to March will carry northerly or N.W. winds until to the southward of Banka and Billiton, when the wind may be expected from West and W.S.W. If it should prove strong and steady, it would be advisable to bear up at once for Bally Strait, as much loss of time is experienced by attempting to beat out through the Strait of Sunda during the spurts of westerly wind, which sometimes hang at S.W. for days together. Indeed, commanders who have had opportunities of testing both straits at this season will be disposed to run at once for that of Bally on leaving this port.

Bally Strait has latterly come to be much used by the homeward

bound Dutch ships from Java, even vessels that have loaded at Batavia running down nearly the whole length of the island to avoid a dead beat out of the Strait of Sunda. Pilot cutters are always cruizing during the season under the lee of the land to the northward of the strait, as the commanders of the Dutch Indiamen are under instructions not to pass through without a pilot; but his assistance is scarcely necessary, as there are no hidden dangers in the narrow part of the strait. All Dutch ships anchor at Banyu Wangi for live stock and fresh water. The latter is particularly good and easy of access, as it is led down from the spring in the mountain by an aqueduct, which is carried out into the sea beyond low water mark. As good water is scarcely attainable by shipping on the North coast of Java, this convenience may have something to do with the popularity of the strait. There is never any difficulty in getting out of the strait to the southward at this season, even with a S.W. wind, as the strait opens to the S.E.

The S.E. trade will be met with in from 10° to 16° S. Sometimes there is only an interval of a few hours between the cessation of the monsoon and the setting in of the trade wind. But there is more generally a week or ten days of calms, light airs, and occasional squalls from the southward before getting the regular trade. It extends at this season as far as 32° S., and S.E. winds are often experienced as far as 40° S., when it will be advisable to stand on into the westerly variables, which prevail about that parallel.

Vessels bound to Port Curtis or New Caledonia should pass to the southward of Van Diemen Land, as easterly winds prevail in Bass Strait during the summer season. In these high latitudes the winds are sharp and bracing, but a native crew will not suffer much if well clad. After passing Van Diemen Land, a vessel bound to Port Curtis should not approach the East coast of Australia nearer than three hundred miles until near the parallel of Sandy Cape (24° 40′ S.), as N.E. winds prevail along shore. A direct course may be made to New Caledonia after rounding Van Diemen Land. Should supplies be required before the passage is completed, Hobart Town is the most convenient port to touch at.

Eastern Routes.

The Eastern or more direct routes to Port Curtis and New Caledonia can only be adopted with a tolerable certainty of meeting with favourable winds throughout the passage, by vessels leaving Singapore between the middle of November and the middle of February. The route to the North of New Guinea, which, from the first half being identical with that followed by ships bound to China by the Eastern Passage, may be called the "Eastern Passage Route," is best suited for vessels over 150 tons burthen. Smaller vessels, more especially if the number of people on board is so great as to render supplies of wood and water necessary during the voyage, should take the Torres Strait Route, which, indeed, is the only one that can be adopted with ordinary safety by vessels under eighty tons burthen.

Eastern Passage Route.—The first half of this route is so well known, from its being frequented by vessels bound to China during the westerly monsoon, that it will only be necessary to notice the ports on this portion of the route that are most convenient for obtaining supplies, should they be required. These are Bonthain, at the South extreme of Celebes, and Gebi, an island in the Gilolo Passage. The former has a secure and convenient anchorage during the westerly monsoon; and fresh water, wood, fruits, vegetables, and live stock can be obtained on very moderate terms. The water is particularly good, as it is supplied by springs in the Lumpo Batang mountain, at the foot of which Bonthain is situated. Gebi also has an excellent anchorage, and the water is of the best quality; but in other respects it is not so good a refreshment port as Bonthain, besides which, it is a little out of the way if the most direct route through Dampier or Pitt Strait is taken. But it is the last port on the route at which it will be advisable for small vessels to touch, as Port Dory is not convenient, and the natives of the islands further to the eastward, although extremely anxious to trade, are a formidable race, and intercourse with them had best be avoided.

The passage to the eastward along the North coast of New Guinea is well known to the whalers of the Pacific, who, when they happen to have drifted off their fishing ground with the easterly winds, recover their position by taking advantage of the westerly winds which prevail at this season near the line, and extend far into the Pacific. But these experienced navigators rarely publish their notes, being satisfied with making their passages in the quickest possible time, without caring whether others adopt them or not. It will therefore be necessary to look up other sources of information for those details which will naturally be expected under the circumstances.

The first navigator that passed along New Guinea from West to East was the celebrated Dampier, who became aware of the existence of a westerly monsoon in these seas while cruising with the buccaneers. When on their return to Europe from the West coast of America, in the year 1687, they touched on the coast of Celebes, and, departing in the month of November, they met with westerly winds, which obliged them to stand to the South, past Timor, until they reached the N.W. coast of Australia. Twelve years afterwards, Dampier returned in a king's ship, the *Roebuck*, for purposes of discovery, and leaving Timor on the 12th of December, he sailed for the coast of New Guinea with westerly winds, and passed through the strait that bears his name to the North coast, along which he ran as far as New Britain (more than 1,200 miles), which he circumnavigated and examined. The westerly monsoon was very strong this year (1699) often amounting to a "fresh gale," and they were unable to commence the return voyage until nearly the end of March. The westerly winds, however, did not cease until a month afterwards, but they found a current setting in the opposite direction at the rate of a mile an hour.

The next authority for the winds during this season is Captain

Thomas Forrest, who sailed from Balambangan to the North coast of New Guinea in November, 1775, in the *Tartar*, galley, belonging to the East India Company, and was on the coast or in its neighbourhood during the five following months. As Captain Forrest seems to have published his journal as it was written, the details respecting the winds are very full and satisfactory. The following is an abstract:—

Day.	Winds.	Strength and Weather.	Remarks.	Day.	Winds.	Strength and Weather.	Remarks.
Nov. 9	S.W.	Fresh.	Lft. Balambangan	Jan. 24		Gale ended.	
10	N.W.	Calm, lt. br.		25—26	N.W.	Fresh.	
11	S.W.	Fresh.		28	,,	Squally.	
13	N.N.W.	,,	Left Cagayan Sooloo	29	,,	Rain.	
				30	,,	Fine.	
14	North.	Moder., fine.		Feb. 2	,,	Moderate.	
17			Arr. at Sooloo	5	,,		
18	S.W.	Squally.		6	,,	Fine.	
19	N.W.	Fresh.	Left Sooloo	7—10	Sy.	,,	
20	N.N.W.	,,		10—17	E. & S.E.	,,	
21	E.N.E.			19	Wy.	Squall., rain.	
22	N.E.			20	Lnd. and	sea breezes.	
23	West.	Moderate.		23	N.E.		
25	,,	,,		24	N.W.	Fine.	
28			Passed Ternate	Mar. 1	Var.	Fine since	24th.
30	West.	Moderate.		3	N.E.		
Dec. 2	N.W.	Fresh.		4	N.N.E.		
4	,,	Squally, rain		5	W.S.W.		
6	W.N.W.	Squally.		6	North.		
7	West.	Fresh.		7	S.W.		
8	S.W.	,,		9	Calm.		
9—10	N.W.			10	S.W.		
14	N.E.		Arr. on coast of New Guinea	11	N.W.		
				12	,,		
16—18	N.W.	Fresh.	Arr. at Salwatty	16	From W.N.W.	12th Wy.	Squalls. Heavy sea at entr. of harb. Efbe on Mysol
19	,,	Hard Gale.					
20	Var.	Rn., cm., fin.					
22	N.W.	Squally.					
23	West.	,,		17	West.	Squall., rain.	
24	N.W.	Rain.		19—23		Fine, light.	
25—26	West.	,,		25	S.E.	Squally.	
27	Var.			28—29	South.	,,	
28	E. & N			30	East.		
29	N.W., E.			Apr. 1	Calm.	Rain.	
30	N.N.W.	Fresh gales.		3—5	West.		
Jan. 1	North.	Gales.		6—8	Calm.	Rain.	
2	Var.			9—10	S.W.		
4	,,	Light rain.		11	N.N.W.	Fine.	
5		Fair.		13	N.W.		
8	West.		Left Salwatty. Current E.	14	S.E.	Rain.	
				15	East.	Squally.	
12	N.N.W.	Fresh gales.	Night fine	16	E.N.E.	Hard gales.	
17	W., N.E.	Rain.		17—27	Var.		
18		Fine.		27	West.		
20	N.W.	Moderate.		28	N.W.		
21	,,	Squally.		29	,,	Fresh.	
22	,,	Mod., squally	Heavy sea	30	,,		
23	,,	Gale.		May 1	South.	Fine.	

The variable winds occasionally experienced are accounted for partly by Captain Forrest being in harbour a great part of the time he was on the coast. From notices that appear in his journal, it is evident that he supposed a strong monsoon to be blowing in the offing.

The next authority is Captain (now Admiral) Keppel, of H.M.S. *Mæander*, who left Port Essington on the 1st December, 1849, with

the garrison and remains of the establishment, with the express object of proceeding to Sydney round the North side of New Guinea, and of putting the practicability of the route to a test. He touched at Banda, and afterwards had to beat to the westward between Ceram and the S.W. coast of New Guinea against a strong breeze with a proportionate sea, in order to get sufficiently to windward to enter Pitt Strait, formerly much used by ships making the Eastern Passage to China, but latterly the Gilolo Passage seems to be preferred.

The *Mœander* entered Pitt Strait on the 21st of December, and passed through with a single tide. "On emerging from the straits, we found the wind still blowing fresh from the westward, with a following swell, and a strong easterly set; but as our course now lay in that direction, before the following morning we were many miles on our voyage, and thereby missed seeing a large portion of the northern coast of New Guinea."*

December 24th.—"We passed Point D'Urville. It had been our intention to visit Humboldt Bay, as laid down in the chart, that we might see something more of that country and its people; but to our disappointment, the strong current carried us past in the night."† The *Mœander* reached the Admiralty Islands on the 29th of December, and remained at this and the neighbouring group, New Ireland, until the 12th of January, wooding and watering, and carrying on a great barter for curiosities with the natives. This impairs the utility of the voyage as a test of the route, or rather of the rapidity with which the voyage can be made. And unfortunately no details are given of the passage from New Ireland to Sydney; but from the track chart it appears that she must have met with easterly winds in about 10° S., as she could not weather the East end of the Louisiade group without tacking, and her course after getting round is laid down as S.S.E. for the few miles that remain before the margin of the chart is crossed. She arrived at Sydney on the 7th of February, 1850, so that the run from Pitt Strait may be estimated at thirty-four days. Of this twenty-seven days were occupied by the portion of the voyage from the Louisiade to Sydney; and as Port Curtis is only half way, and so far to leeward that a ship leaving Cape Deliverance with the wind at S.E.b.E. can fetch the port without tacking, fourteen days will be a liberal estimate of the time that would have been occupied in making the passage to Port Curtis.

The deficiency in the *Mœander's* journal is partially supplied by that of H.M.S. *Rattlesnake*, which left the Louisiade group for Sydney on January 8th, 1850, while the *Mœander* was at New Ireland. For the first few days the wind varied from N.E. round by the Northward to S.W., and they did not get the trade wind until they reached 20° S., when it blew a steady breeze between E.S.E. and S.S.E., enabling them to fetch Sandy Cape, about 120 miles to the southward of the parallel of Port Curtis. The *Rattlesnake* made the passage from the

* Keppel's *Voyage of the Mœander*, vol. ii. p. 190.
† Ibid, p. 201.

Louisiade group to Sydney in twenty-eight days; but the date at which she made Sandy Cape is not given. It is evident that the sea which lies between the Barrier Reefs and New Caledonia must be considered a region of variable winds during the period in which the S.E. trade wind is held in abeyance by the westerly monsoon.

The following paragraph on the winds in this neighbourhood is extracted from a paper on the Steam Route through Torres Strait in the *Indian Archipelago Journal* for 1851, p. 493. Several additional passages from West to East by sailing vessels have been made since that time, but the additional experience has not rendered any correction necessary.

"Hitherto Torres Strait has only been navigated generally by ships passing from East to West; but on three or four occasions vessels have sailed through in the opposite direction. This passage, however, has always been attended with great delay, as it was found that the westerly monsoon, which prevails from November to March inclusive in the seas of the Indian Archipelago, does not blow steadily within Torres Straits, where it only appears in spurts of eight or ten days' duration about the change of the moon. Occasionally these westerly winds blow with considerable strength; but they are usually unsteady, in fact mere interruptions of the S.E. trade wind. These spurts may be expected in November and in the following months until March. Sometimes, but rarely, they are encountered as late as April. In this month of 1844, the writer, while *en route* from Sydney to Port Essington by the Middle Passage, met with a spurt of N.W. wind when in lat. 19° S., which lasted from the 24th to the 29th of the month. It blew a steady six-knot breeze throughout this period, and the writer was subsequently able to trace it to Port Essington, the Arru Islands, and Macassar, where it blew with some strength, and was remarked as an unusual occurrence so late in the season. This period appears to be the fine season in Torres Strait, (as is the case in the Moluccas,) at least to the South of Cape York, as this is the time chosen by the Murray and Darnley Islanders for making their annual excursions to the islets which lie off the N.E. coast of Australia. The question of winds is, however, of little importance when steam routes are under consideration, especially on the present occasion, as parties interested will be satisfied on learning that no winds have ever yet been experienced in Torres Strait which are calculated in the slightest degree to interfere with the progress of steamers in either direction."

We have another authority for the winds and currents on the North coast of New Guinea in Lieutenant De Bruiju-Kops, of the Dutch navy, who visited the coast in the Government schooner *Circe* during the same season as the *Mœander's* visit, but much later, and the details are not without interest. The object of the voyage was to examine Humboldt Bay with a view to settlement. The *Circe* ran down from Java to Amboyna with the West monsoon, and left the latter place on the 16th December (1849) for Ternate, where they were to receive their instructions; but, meeting with strong N.W. winds (the same spurt that the *Mœander* experienced in that neighbourhood) and a

strong current setting to the eastward, they were forced to put into Wahaai, a port on the North side of Ceram, where they heard of the *Mœander* having passed. This was on the 24th of December, and they lay wind-bound until the 13th February, when they put to sea, and reached Ternate on the 25th. It was not until the 15th of March that they finally sailed for New Guinea, and arrived at Gebi, an island in the Gilolo Passage, on the 19th. Here they were joined by a fleet of Molucca prows, belonging to the Sultan of Tidore, which accompanied them for the remainder of the voyage. Leaving Gebi on the 26th March, they passed through Dampier Strait, were abreast of Cape Good Hope on the 29th, and entered the Great Bay on the 31st, where they anchored at Port Dory. The direction of the wind from leaving Ternate is not given, but it must have been favourable throughout.

The *Circe* remained at anchor at Port Dory until the 25th April waiting for the flotilla of prows, which did not join until the 20th. The winds during their stay are stated as follows:—"From the 1st to the 22nd April the wind for the most part was S.E. and N.E., which towards evening was often alternated with N.W., seldom with S.W. winds." Weather fair, but occasional showers. On the 25th, left Port Dory with light westerly winds, and stood into the Great Bay, where several trading stations were visited, and on the 11th of May they anchored at the N.E. point of the bay. During this period, regular land and sea breezes were experienced, the first at S.E. and the latter at N.W., but an adverse current was found in the offing, setting W.N.W. On the 24th of May a strong breeze set in from S.S.W., which in four days carried them up to Humboldt Bay; but as they were about to enter, the wind shifted to S.E. and E.S.E., with a chopping sea, and the *Circe*, being a slow and far from weatherly vessel, was forced to bear up and return to Amboyna.

The details of the latter portion of the voyage given above will not be of much use to navigators, who are supposed to adopt this route during December, January, February, and part of March, the only period in which westerly winds can reasonably be expected to remain steady; but they are interesting as showing the possibility of fast and weatherly vessels being able to make the passage even late in the season.

The *Mœander* lost the strong westerly wind and favourable current when she approached the Admiralty Islands. It is therefore a question whether she would not have made a more rapid passage by running down her easting along the line as far as Schanks Island, or even farther, if the wind held, when, by getting into the S.E. trade, she would have had a free wind for the remainder of the passage. That the westerly winds blow thus far the writer of these notes is aware from his own experience, having crossed the line at the latter end of December, 1847, with a westerly gale that had brought the ship under close-reefed fore and main topsails, and the squalls were so heavy that the fore topsail had to be taken in twice during the night. We had

left Sydney, bound for Hongkong, December 8th, and met with N.E. winds, which obliged us to stand off the land for about 200 miles, when we got S.E. winds, which carried us to 14° S., when the wind came to the westward, light at first, but gradually increasing as we approached the line. We made Schanks Island on the 31st December, passed to leeward of it, crossed the line the same night, and lost the westerly wind between 6° and 7° N., getting the N.E. trade almost immediately after.

New Caledonia.—As regards vessels bound to the French settlements in New Caledonia by the Eastern Passage Route, there can be no doubt that it would be advisable to run down their easting along the line, even as far as the meridian of 150° if the wind holds, as the trade will be met with at this season, when well to the eastward, in about 10° S., blowing steadily between East and E.S.E. as far as 20° S., this will enable them to lay to windward of the New Hebrides Group, which, with New Caledonia, seems to be the barrier between the trade wind of the South Pacific and the variables of the Papuan Sea.

Torres Strait Route.

The Torres Strait Route to Port Curtis is the most direct, the distance being 3,400 nautical miles. This route is better suited for small than for large vessels, for although the depth of water is sufficient for the largest ships, and the navigation is no where more difficult than that of the Straits of Malacca between Pedra Branca and the North Sands, still commanders who have been accustomed chiefly to open sea navigation often feel uncomfortable. But, on the other hand, it is the only route that can be adopted with safety by vessels under eighty tons burthen, unless they carry a much larger supply of water than is usually the case, for there is no place near the Eastern Passage Route, after passing Port Dory, where a small vessel can obtain water with safety, owing to the formidable numbers and character of the natives, who, although friendly enough towards large vessels, might be tempted to lay violent hands on small craft.

The track as far as Bonthain will be the same as that of the Eastern Passage Route, but after passing through Salayer Strait a south-easterly course has to be followed towards the North side of Timor, along which the track passes. If supplies are required, Manatuti, a Portuguese settlement about eighty miles East of Dilli, is the best place to touch at, as the road is sheltered from the westward by a point of land; but if the breeze is fresh from any point to the northward of West, it will not be safe to approach the coast very close. In that case, the bay on the West side of Kissa, or the South coast of Moa, will be the best place to visit, as small vessels can lie close to the shore, and the anchorage is perfectly safe at this season. Fresh water, poultry, fruits, and vegetables, including excellent yams and sweet potatoes, can be obtained here in any quantities that may be required on very easy terms, as cash is almost unknown and the natives gladly

exchange their produce for small cutlery, calico, pieces of bar iron of the size required for a parang, empty bottles, old clothes, buttons, and other trifles. At Kissa there will be a slight delay, as the chief villages are all on the East side of the island, and two guns should be fired as a signal for trade. At Moa, the best place to touch is a bay on the South coast, about four miles beyond the S.W. point, where there are four villages close to the shore—of which Patti is the most important—and an old Dutch fort. The chiefs and principal inhabitants of Kissa and Moa are Protestant Christians, and Dutch missionaries resided at both places during the existence of the establishment at Port Essington, when there was frequent intercourse, the natives proving particularly friendly towards Europeans.

The Macassar prahus employed in the trepang fishery in the Gulf of Carpentaria (high-sterned vessels, with the tripod mast) always adopt this route. They leave Macassar about Christmas, and generally touch at Dilli or Manatuti to fill up water and dispose of some native cloths, and also occasionally at Kissa, Letti, and Moa; but those that leave later in the season make one run of it, and sometimes complete the passage from Macassar to the Gulf in ten days.

Endeavour Strait seems to be the best entrance to Torres Straits from the westward, now that the survey has been completed. The following directions, which are extracted from the fifth volume of the *Journal of the Indian Archipelago*, will carry a vessel in by a channel where the least depth is 4½ fathoms at low water:—

"The western entrance of Endeavour Strait is easy to make. At a distance of 120 miles to the westward the soundings begin to decrease from thirty-six fathoms, the usual depth across the mouth of the Gulf of Carpentaria, to thirty, twenty, and nine fathoms as the strait is approached. The only precaution necessary to be taken when running for the strait is to avoid going to the North of the parallel of Booby Island, as there are some shoals to the W.N.W. which have not been well examined, from being out of the usual track. To the South of this parallel the sea is perfectly clear of danger and has been well explored. In clear weather Prince of Wales Island, which may be seen from a distance of thirty miles, will probably be made before Booby or Wallis Islands, which, although moderately elevated, are not visible from a ship's deck much more than fifteen miles. There are several channels into the strait through the sandbanks which project from Prince of Wales and Wallis Islands, and from the mainland, but the widest and most available is that which lies immediately to the North of Red Wallis Island. By bringing Booby Island to bear N.b.E., mag., distant ten miles, when Red Wallis will bear E.b.S.¾S., a direct course steered for the latter will lead clear into the strait between the spits which project from Cape Cornwall and the Wallis Islands, and will also clear two patches of three fathoms which lie in the channel. The depth is from four and a half to eight fathoms. The strait is perfectly clear within, with the exception of the Heroine and Eagle Rocks, which may easily be avoided; and, as it has been repeatedly examined and sounded in the course of the last eight years

by Captains Blackwood, Stanley, and Yule, Endeavour Strait may be considered as one of the best surveyed spots in the Eastern Seas."

Nearly a dozen passages have been made from India to Sydney by way of Torres Straits, mostly at long intervals, with the exception of the three voyages of the brig *Heroine*, Mackenzie, in 1844–5–6, but although no accident took place, the results were not sufficiently favourable to lead to a more general adoption of the route. All these vessels passed through the Barrier into the open sea as soon as possible, and were delayed by the variable winds, which are now known to prevail at a distance from the land. It was not until 1847 and 1848 that the inner passage along the land came to be tested by the vessels employed in attending Mr. Kennedy's overland expedition from Rockingham Bay to Cape York, when it was found that the easterly winds often experienced outside the Barrier very rarely blow home on the land, and that north-westerly winds occasionally blow along the coast for days in succession. The monsoon, however, more generally appeared in the form of a land wind, rising about midnight and blowing through the greater part of the following day, when it would fall calm until midnight. This inner route, too, has the advantage of having been accurately surveyed by the late Captain King, and of being perfectly free from coral, which is attributed to the fresh water from the rivers being carried along the coast by the tides. The navigation of the inner route is also comparatively easy, owing to landmarks being always in sight during the day, and often during the night also, for the weather is remarkably clear, this being the fine season. Showers are often experienced, particularly during the night, when the land breeze comes off, and much rain falls on the high land of the interior, as is shown by the volumes of fresh water poured out by the rivers.

Nevertheless, the passage along the coast from Cape York to Port Curtis will occupy more time than would be expected from the smallness of the distance, a little more than 900 miles, for it will be necessary to remain at anchor during dark nights for the first 500 miles after leaving Cape York, and if the passage is made in twelve days it will be a favourable run.

New Caledonia.—Vessels bound to New Caledonia by the Torres Strait Route should enter by Prince of Wales or Bligh Channel, and take the wide northern passage discovered and surveyed by Captain Blackwood, of H.M.S. *Fly*, the entrance of which from the Pacific is forty miles wide, with regular soundings. Hence, along the South coast of New Guinea and the Louisiade West and N.W. winds may be expected without interruption during December, January, and February, and probably much later, for the mass of high land creates a temperature which causes a rush of air towards the region of variables to the S.E.

The following memoranda are from the journal of H.M.S. *Rattlesnake*, in December, 1849, and January, 1850, while completing the survey previous to sailing for Sydney:—

Dec. 11th, 1849.—A light air from the N.W. (Darnley Island).

16th.—Light winds from the 11th. This day "a strong N.W. breeze, which came on last night, and caused us to drag the stream anchor."

19th.—Left Bramble Kay with a fine breeze from the N.W.

20th.—Wind N.W. At daylight abreast of Cape Possession.

21st.—Light north-westerly breeze.

28th.—Since the 21st at anchor in Redscar Bay. During the week "the wind was usually from the westward, varying between N.W. and S.W., and on one occasion had a sudden and very violent squall from the westward." This is the identical week during which the *Mœander* made her longest runs on the North coast of New Guinea with N.W. winds and a strong current in her favour.

Jan. 6th. 1850.—"Our passage to the Duchateau Islands (Louisiade Group), a distance less than 400 miles, has been protracted [the *Rattlesnake* sailed from Redscar Bay on the 31st December] by the prevalence of light winds, although these were generally favourable, or from the westward. Occasional calms, squalls, and rain occurred, but the weather generally was finer than during the S.E. monsoon."—(Vol. ii., p. 60.)

The *Rattlesnake* left the Louisiade for Sydney on the 8th of January. This part of her voyage has already been spoken of in the notes on the Eastern Passage Route, but the following memorandum by the historian of the voyage may be added:—"Our daily average progress during the passage to Sydney (which occupied a period of twenty-eight days) was less than fifty miles.* The winds for the first few days, or until beyond the influence of the land, were light and variable, shifting between S..W. and N.E. by the northward, and accompanied by occasional squalls and rain. It became a matter of difficulty to determine when we got into the S.E. trade; it was not until we reached lat. 20° S. that the wind, light on the preceding day, but on this strong, with squalls and rain, appeared steady between E.S.E. and S.S.E., and this carried us down to Sandy Cape." (East coast of Australia, lat. 24° 45′ S.)—*Singapore Free Press.*

Dartmouth Harbour.

Allusion was made in our last number to a claim on the part of Dartmouth Harbour for improvement and even defence in its present exposed condition, and the claims are so well founded that for reasons too obvious we do not see how they can be slighted. At a meeting which has been duly reported in the local paper, those claims were made evident enough in the few but home remarks that were made.

* It should be mentioned that the *Rattlesnake* was a remarkably dull sailer. She was a frigate-built ship of 450 tons, and carried twenty-four carronades when a war vessel. She was rigged as a barque, and had a large poop built on her when she was fitted for the surveying service.

It was even pointed out there that the Refuge Harbour Committee were not even informed of the wants of Dartmouth. In reference to this Commission Capt. Sheringham is stated to have said:—

"During the investigation which has taken place on the Harbour of Refuge question, I was surprised at one fact: when the question was put by the Committee as a general question, 'Do you consider any port in the Channel requires attention at this moment?'—'tis an odd fact, but a true one, that 'No' was the answer generally given. There was, however, a very great mistake made in that answer. The different ports found advocates then, Falmouth had a voice, Rye was heard, Newhaven was heard, but there was not a little finger lifted up for Dartmouth, and he would venture to say that there is not a port from the Lizard to the straits of Dover that more requires, commands, and demands attention. It strikes me that if you want anything you must ask for it; taking care that we have good reasons for asking. He believed that a port so situated as Dartmouth is, commanding from its position a high character as a harbour, does deserve the most earnest attention of the Government. Where else, he would ask, could a ship run so readily on this coast, and, regardless of tidal circumstances, find themselves so easily afloat in a still basin of water? Again, and by no means a less important consideration,—is it not strange that such a harbour as Dartmouth, with its mouth wide open, is not yet furnished with its teeth?"

Then we find Mr. H. Studdy proving that "no harbour could be so easily adapted to these three purposes as Dartmouth," viz.:

"1st.—That they should be easily accessible. 2nd.—That they should be capable of containing ships of war; and, 3rd—That they should be easy of defence"

And Capt. De Vere, as Inspector of the Coast Guard by day and by night, observes:—

"How is it that this port has not a beacon? and another remark he had also urged again and again,—'How strange it is that this noble harbour has no fortification, when it could be so easily and cheaply placed and made so impregnable?' Yet this is the case; and still, hitherto, no port in England has been so neglected! You can boast of the greatest heroes in naval history—you have your Drake and your Raleigh—your are their successors, and are positively unknown. Speak of Dartmouth to a stranger and you may as well talk of Salcombe."

This is all in our opinion very just and proper for consideration, and we cannot but conclude that the important facts pointed out in the Memorial, which we here quote, will receive that attention which a paternal government would give to a very vulnerable point in the shores of this country,—besides being one also that with the improvement of the beacon and removal of a rock as recommended would hold out that facility of access which is so often required for refuge from the storm. The memorial says,

"That Dartmouth is a natural harbour of considerable extent, with a sufficient depth of water at all times of tide for ships of the greatest draft, and with ample room for a considerable number to lie afloat completely sheltered from all winds.

"That no other harbour in the Channel can compete with it as affording equal accommodation, with the exception of Portsmouth, Portland, and Plymouth, and even these ports must under many circumstances be inferior to Dartmouth for the protection of disabled vessels.

"In order to confirm the opinion of your memorialists as to the value and character of the harbour of Dartmouth, they respectfully solicit attention to the Report of the Committee appointed by your lordships, in the year 1840, to inquire as to the comparative advantages afforded by different ports in the Channel as ports for the departure and arrival of the West India, Vigo, Oporto, Lisbon, Cadiz, and Gibraltar Mails, wherein it is stated,—'Having therefore given the fullest consideration to all that has been adduced in support of the claims of Southampton, Portsmouth, Dartmouth, Plymouth, Devonport and Falmouth, and having most anxiously and deliberately viewed the whole question in its various bearings, &c., we beg to state our opinion that Dartmouth will be found the most eligible port wherein the mails to and from the West Indies, &c., may be embarked and landed.' And again,—'In the entrance to Dartmouth from the westward the "Home Stone" is in the way, and in approaching from the eastward the "Ledges" must be avoided; but upon these dangers we need only state our conviction that with no great amount of lighting and buoyage the harbour may be rendered most easy of access to steam vessels by night and by day. Any other port which might have been chosen by us, would have required the same assisting guides, and some to a much greater extent. There is an abundant depth of water in the channel to and within the harbour of Dartmouth, and from the contracted state of the former, vessels, when at anchor in the latter, are, in the most comprehensive meaning of the expression, "land-locked." The rise of tide is ample and the strength of its stream moderate.'

"Not alone as a convenient port to the passing trade does Dartmouth recommend itself to especial notice, but from the still higher consideration that in the event of a war it must, from its peculiar position, and its great aptitude for a naval station, become most valuable to our merchant ships as a refuge from the storm and a retreat from the enemy; as well as one of the national harbours of defence and aggression in the Channel.

"Such being the case, your memorialists, holding as they do so large a stake on the shores and in the neighbourhood of the Dart, cannot close this part of the subject without stating with all deference, and with all possible submission, their intense alarm that so accessible a harbour should remain in its present utterly defenceless state. But on so momentous a question as the national defences of the country, your memorialists do not presume to enter further than merely to re-

fer to their own position, now become so assailable through the introduction of steam to vessels of war.

"Your memorialists beg leave to draw the attention of your lordships to the fact, that the claims of the harbour of Dartmouth for your consideration, are not so much based on its merits as a private trading harbour, as of one of refuge and defence from its commanding position in the Channel; a distinction which they cannot press too strongly, inasmuch as it has not required any tolls or harbour dues for its maintenance and improvement. As a harbour of refuge, your memorialists invite the attention of your lordships to the opinion given by the late Committee of the House of Commons upon that most important subject. Their report says,—'Now it appears to your Committee that the principle which distinguishes private trading harbours from harbours of refuge, and which points them out to be the objects of local and private enterprise, is that they are constructed principally in reference to the wants and convenience of such localities; whereas harbours of refuge upon our open coast are constructed not for the use of any individual port or community, but for the use of all the shipping, both British and foreign, frequenting or passing our coast; and it seems, therefore, to your Committee that the entire community of the country and the Government, stand in the same relation to harbours of refuge as individual communities and corporations stand in relation to private trading harbours.'

"Without presuming to dictate to your lordships how best this object may be attained, your memorialists beg leave most respectfully to state what from their local knowledge and experience appears to them to be most urgently required.

"1.—That from the peculiar formation and uniformity in appearance of the adjacent high lands on both sides of the harbour, overlapping as it were one another, the entrance thereto is frequently very difficult to recognize; your memorialists therefore are of opinion that if a lofty and substantial beacon or day mark was built in some commanding position on the East side of the entrance, this serious difficulty in making the harbour, so much complained of by strangers, would be entirely removed.

"2.—That the result of Capt. Sheringham's survey of the port, executed in 1853, under the orders of the Board of Admiralty, has been the discovery of a highly dangerous and sharp pointed rock, called the Pin, having, it is reported, as little as 13 feet water only over it at low water, situate nearly a mile from the harbour's mouth in the middle of the fair way. Your memorialists humbly submit that it is most desirable that the character of this rock should be accurately ascertained, with the ultimate object of removing, if practicable, so much of it as would be necessary to insure a sufficient depth of water over it for large ships.

"3.—That other dangerous ledges were discovered in the progress of the aforesaid survey to the eastward of the Castle Ledge, the position of which it is essential should be accurately marked by placing a buoy near the West Rock.

"4.—Your memorialists beg to draw the attention of your lordships to the fact that the existing light at the Battery Point was established by private enterprise, and is found to be hitherto more than self-supporting by a voluntary tax of a farthing a ton; but although the present light is of immense value and benefit to vessels entering the port, your memorialists submit that it is far from being all that is requisite for the safe navigation by night of so important and greatly frequented a harbour as Dartmouth; and your memorialists further state with all due deference and respect, that it appears to them to be highly inexpedient that so great a responsibility as the charge and control of a refuge harbour light should rest with a private body, powerless to enforce a tax for its support, and not legally answerable for its due preservation and efficiency.

"In conclusion, your memorialists submit with every hope and humble confidence their respectful memorial for your lordships favourable consideration."

The foregoing arguments are so formidable, that we do not see how the claims of Dartmouth can be forgotten.

JAPAN A CENTURY AGO.

"We extract the following interesting remarks on Japan from an old work in the possession of Mr. George Peacock, F.R.G.S., of Starcross, entitled, the *Universal Traveller*, published by Mr. Salmon, and printed for Richard Baldwin at the Rose in Paternoster Row, MDCCLII.]

Japan was not known or even heard of in this part of the world for upwards of forty years after America was discovered by Columbus, and then by mere accident. Antonio de Moto, a Portuguese Commander, being driven upon the coast by a storm, in a voyage towards China, in the year 1542, was the first European that arrived there; soon after which, the Portuguese began to traffic with the Japanese, and had the sole trade thither for upwards of sixty years, when the English and Dutch arrived here. However, the Portuguese still continued to trade thither, and having introduced their missionaries, made great numbers of popish proselytes until the year 1630, when the Japanese Government, apprehending that the Portuguese were in a conspiracy against the State, massacred or banished all the Christians, and determined never to admit any more of that religion into their country except the Dutch. What could be the reason of this severity against the Christians, cannot be determined; but it seems probable that the preaching up the Pope's supremacy, and suggesting that he was superior to all earthly monarchs, and ought to be obeyed rather than their temporal prince, gave the Dutch a handle to insinuate to the Court of Japan that they were about to absolve the people from their allegiance, and persuade them to acknowledge

the Pope for their sovereign: it was thought prudent therefore to massacre the Portuguese and their disciples before they became too numerous. It is generally said, indeed, that the Dutch were permitted to trade with Japan, when all other Christians were excluded, because they denied their being Christians, trampled upon the cross, and expressed the utmost detestation of the Christian religion: and there may be some truth in this. The Dutch would stick at nothing to monopolise the trade of these islands.* The Dutch knew that the English were Protestants, and as far from espousing the deposing doctrines as themselves, and more devoted to their lawful princes; but they could never have procured the English to have been excluded the trade to Japan, if they had not represented that the English, as well as the Portuguese, were tainted with the same pernicious principles. Certain it is, whatever motives the Japanese were governed by, no other Europeans are permitted to trade thither but the Dutch; nor have the Portuguese much reason to clamour at the Hollanders' crafty insinuations, who had practised the like arts before, in order to monopolize that rich traffic; for the Portuguese themselves had represented all other people who came to trade there as pirates and robbers to prejudice the Japanese against them. The Japanese are so jealous even of the Dutch, that when any of their ships arrive they take off their rudders, sails, and guns, and carry them on shore, until they are ready to sail, and their factors and people are shut up in the little island of Disnia, which is not two miles round, being parted from the city of Nangasaque by a little channel or strait of the sea. The people in the island assigned to the Dutch are not allowed fire or candle in the night time, or permitted to come into the city of Nangasaque for eight months of the year, and when the ship arrives not a man is suffered to come on shore till an express is sent up to Court and returned, and then the crews of the several ships are mustered

* In Dean Swift's admirable satire, *Gulliver's Travels*, in the voyage to Laputa the authorities at Jeddo were instructed to allow Gulliver to pass the gates of the city without the usual ceremony of trampling on the cross. "I answered, as I had before determined, that I was a Dutch merchant shipwrecked in a very remote country whence I had travelled by sea and land to Luggwagg, and then took shipping for Japan; where I knew my countrymen often traded, and with some of these I hoped to get an opportunity of returning into Europe. I therefore most humbly entreated his royal favour to give order that I should be conducted in safety to Nangasac: to this I added another petition that for the sake of my patron the King of Luggwagg, his Majesty would condescend to excuse my performing the ceremony imposed on my countrymen of trampling upon the crucifix, because I had been thrown into his kingdom by my misfortunes without any intention of trading. When this latter petition was interpreted to the Emperor, he seemed a little surprised; and said, he believed I was the first of my countrymen who ever made any scruple on this point, and that he began to doubt whether I was a real Hollander or not; but rather suspected that I must be a Christian: however, for the reasons I had offered, but chiefly to gratify the King of Luggwagg by an uncommon mark of his favour, he would comply with the singularity of my humour." Chap. xi.—*G. P.*

before the Japanese commissary and their names called over, to see if the account given in by their officers is right. In the mean time, the Dutch are allowed to carry up a present to the Emperor at Jeddo, and receive another of his Majesty for the Company, which journey usually takes up three months; after which, they receive permission to trade in a very limited manner; and there is a kind of fair kept in the city of Nangesaque, and the island of Disnia, for six weeks, and then the Dutch are confined again to the island, and suffered to have no correspondence with the Japanese, except with the wenches they hire to cohabit with them, till the shipping returns the next season.

As the land of Jesso lies North of Japan, and is by some conjectured to be contiguous to it, this is a proper place to mention it, though we know little more of it than that there is such a country. As to the reports we have of the natives being savages, that their skins are hairy, and that in many respects they resemble wild beasts, such fables are not to be minded; for upon the discovery of every country the traveller seldom fails to furnish us with a race of monsters. Captain Saris, who commanded an English East India ship, that traded to Japan, assures us we are imposed on in these relations, and ought to give no credit to them; that the inhabitants of Jesso do not differ from those of Japan, either in their stature or complexion; that the people in the South were civilised, and traded with Japan, and that they made their payments for their clothing and other goods in gold dust, and that there was a town in Jesso named Matzimory, where the Japanese had a garrison. It has been supposed by some, that this land of Jesso extends so far to the North-East, that it is contiguous to America, or at least that there is a very narrow strait between Asia and America.* This hypothesis, I presume, was advanced in order to account for the peopling of America from the Eastern Continent; but surely there is very little colour for such a supposition. The authors of this opinion were very unfortunate in imagining that the two continents were contiguous on this side, since they are divided by a vast ocean, in most places 10,000 miles over, and in no part has it been found so little as 3,000 miles over. As the English have had no commerce with Japan for upwards of one hundred years, and we can receive no intelligence from thence but what the Dutch are pleased to give us, a letter from an English East India Captain to his friend in England, when we were allowed a free trade to that kingdom, may give us a juster account of the state of it than anything that has been communicated to us since; the substance whereof is as follows:—

Sir,—I arrived at Firando, one of the islands of Japan, on the 11th of June, 1613. It is situate in 33° 50′ North latitude, a little West of

* Yesso, the northernmost of the Japanese Group, is here no doubt confounded with Saghalien and Kamskatka, so little was known of the science of remote eastern geography in the early and middle periods of the eighteenth century. The gold dust mentioned might probably have been brought from the South-eastern side or Altaic range of the Uralian Mountains, down the River Amoor by Russian traders.—*G. P.*

the island of Bongo. Here Foyne Sama, the Viceroy of King Firando, as he is called, came on board our ship with his nephew, Tone Sama. They were attended by forty galleys, some of them rowed with ten, and others with fifteen oars of a side. The King and his nephew were clothed in bule silk gowns, and each of them had on a fine linen shirt and breeches; their heads were shaved half way, the rest of their hair, which was very long, was tied up in a roll on the hinder part of the head; they had neither hat nor cap on, nothing on their heads but their hair; each of them had a kind of steward, who commanded their slaves. They saluted me by putting off their shoes, and clasping their hands together, and bowing a little, carried them as low as their knees. I entertained them in my cabin, after which they took their leave, and several of the great men of the island came on board, every one bringing a present of venison, fish, fowl, or fruit. The King came on board again and ordered sixty of his galleys to assist in bringing the ship into the harbour, there being a dangerous point to pass. I came to an anchor at length before the town of Firando, in five fathoms water, so near the shore that I could talk to the people in their houses. We saluted the town with nine pieces of cannon, but they had none to answer us, and no fort, but a barricade for small shot.

The ship was continually crowded with people, among whom were some women of quality, that I introduced into my cabin; and seeing the pictures of Venus and Cupid there, they immedietely fell down and worshipped them, taking these pictures for the Virgin Mary and her Son, having been taught to adore such pictures by the Portuguese missionaries. The King afterwards brought some of his ladies on board, who had silk gowns on, one side folded over the other, and girt with a sash, their hair long, and tied up in a roll on the crown of the head, none of it shaved off. They had good features, were very fair, but had no colour in their faces except what they had laid on. They were of a low stature, but very fat delicate limbs, their legs bare only a sort of half buskin tied on the insteps with ribbons; they they seemed something bashful till the King bid them be merry, and then they sang and played on an instrument that resembled a lute; they kept time and sung and played by books; and after I had entertained them and made them some small presents of English curiosities, the King and the ladies took their leave. I afterwards went on shore, and delivered my presents to the King, in which were plate and other things to the value of £140, and his Majesty invited me to an entertainment, drank to me out of one of the cups (part of the present) filled with rice arrack, containing a pint and half. He drank it off to the King of England's health, in which I pledged him, and he made all the company do the same. The King afterwards brought some actresses on board, who go from one island to another acting comedies in the great towns they pass through. They are all one man's slaves, who sets a certain price on their favours, which he can never advance, on pain of being capitally punished; there is no bargain made with the courtezan, but with her master, whom she is

obliged to obey. A nobleman, when he travels, is not ashamed to send for one of these keepers to his inn, and bargain with him for one or more girls to wait on him at table, and be his bedfellows, if he thinks fit; for all men of fashion are waited on by women only in the house.

These keepers of hackney girls in their life time are admitted into the best company; but when they are dead the corpse is treated with the greatest indignity, not suffered to be buried, but dragged through the streets, and thrown into the fields to rot above ground, or be devoured by dogs. A Dutch ship coming in while I lay at Firando, it was reported that the crew were Englishmen, for the natives did not at first distinguish one of these nations from the other, and the Portuguese had represented both as pirates, and taught them a song which they called the English hofornia, acting a kind of farce also, wherein they pretend to show how the English attack the Portuguese ships at sea. While we lay in the harbour, two of the officers happening to quarrel, and a challenge to fight on shore appointed, we were in great danger of being called to account by the magistrates; for, according to their laws, whoever draws a weapon in anger is to be cut in pieces immediately, though he does no hurt; and if he wounds another, the whole family or company to which he belongs suffers with him.

The King of Goto, an island a little South of Firando, being brought on board by King Foyne to take a view of our ship, I entertained him very splendidly, and shot off several guns on his going ashore, at which he expressed great satisfaction, and invited me and my friends to his island.

I have seen some executions here, and particularly of two men and a woman for adultery; two of her lovers meeting at her house together in the absence of the husband, and wounding one another, they were apprehended, and King Foyne ordered all three to be cut in pieces, which sentence was immediately executed, and after the execution every one of the company had a stroke at the sufferers with their luttans (swords) till their flesh was all cut into little bits.

On the 3rd of August King Foyne furnished me with a galley with twenty-five oars of a side, and sixty men besides, to carry the King of England's present to the Emperor. We passed between several islands, most of them well inhabited, and several good towns upon them, particularly the island Finate, defended by a strong castle of free stone. And along the coast as far as Osaca, were people who lived with their whole families in vessels upon the water, and their women catched fish by diving for them in eight fathom water. These women may be known by their eyes, which are as blood. When I arrived at Osaca, I had nineteen horses provided for me at the Emperor's charge, to carry my people and the present; and they furnished me with a palanquin (a couch with an arched canopy) and a led horse, and one ran before me with a pike to make way. We changed horses at every stage. The road was for the most part even, and where a hill happened to be in the road, it was cut through; and the distances were marked at the end of every three miles. Villages and

country houses stood very thick, and the roads were thronged with people. Their temples were usually in groves, surrounded by the cells of their priests. When we came near the suburbs of any great town, we saw the bodies of malefactors nailed to crosses, where they hang till they are devoured, and cause an intolerable stink. We usually travelled about forty-eight miles a day; six men carried my palanquin on their shoulders, and up hill they added four more, travelling as fast as I could have done on horseback.

We arrived at Suranga, where the Emperor resided, on the 6th of September, and on the 8th I was carried in my palanquin to the Castle, which is the Emperor's Court, the merchants and people who attend me carrying the present before me on little tables of sweet-wood they had provided me. Having entered the castle, I passed over three drawbridges, on every one of which was a court of guard; having ascended some stone steps, I was met by the Emperor's Secretary and Admiral, who introduced me into a large room, and sat down on mats cross legged. Soon after I was led between them into the Presence Chamber, where they directed me to bow to the Emperor's chair of state. The present being ranged on the floor, the Emperor came in, to whom I paid my compliments after the English manner, and delivered his Majesty's letter, which he lifted to his forehead, and directed his interpreter to tell me I was welcome, and that I should rest myself a day or two after my fatiguing journey, and his answer should be ready for the King of England. I had afterwards an audience of the King's son, at the city of Jeddo, to whom I delivered my presents. On the 19th the King sent me two suits of armour, varnished, as a present to his Majesty, with a letter, wherein he thanks the King for his present of such curious things as his country did not produce; neither had he seen the like before. His subjects were welcome to him, he applauded their skill in navigation, that they could visit a country so remote without being terrified at passing through so immense a gulf, and such storms, to promote commerce, which he should give them all manner of assistance in, desiring his Majesty to accept his present as a mark of his friendship: And adds, that he had given orders for drawing up Articles of Trade between the two nations, as his Majesty desired. By these Articles he granted that Sir Thomas Smith, the Governor, and the rest of the East India Company might resort to any of his ports to trade, without paying any duties of import or export: that they might build one house or more in any part of his empire; and if any of their goods happened to be wrecked on his coasts, they should be restored; if any of the merchants died, their effects might be disposed of by the Cape merchant; and all offences committed by the English should be tried and punished by him: neither their persons nor goods should be subject to the laws of Japan; that payment should be immediately made for all goods contracted for, without any deductions, and that they should be at liberty to make discoveries on the land of Jesso or Yedzo, and his subjects should furnish them with provisions.

LIGHTS IN LYRICS

A GLANCE AT THE CHANNEL LIGHTS AS PILOTING MARKS ON A RUN FROM SCILLY TO THE NORE.

THE BEACON LIGHT.

Address.

Old Ocean's sons, who dauntless brave
The fury of the stormy wave!
Lend ear awhile to this my tale
Instructive, while you're under sail.
'Tis not of strife, or deeds of arms,—
Nor does it treat of war's alarms:
Lights are my theme, the beacon star,
That guides the mariner from afar!

The Past.—*A Retrospect.*

Ill fared the seaman when in days of yore,
No beacon light was seen upon his shore;
When British Monarch launched upon the wave,
The Holy Sepulchre from Turk to save;
When daring Colon sailed with holy zeal,
The Western World to find for proud Castile;
When haughty Spain, her grand Armada sent,
And threatened England with her foul intent;
When gallant Britons scattered to the wind
Those mighty ships of all the world combined,—
Ere "Rule Britannia" was the guardian strain
Of British seamen on the azure main!
Dark were those times, when England lay
In gloom of knowledge as in gloom of day!
Hard then the trial of the seaman's skill;
Full oft the wreck, full oft the peril still!
'Till Pity shuddered at the scenes she saw,
Of shattered barques in dark aerial war;
And called forth Science, with her sister Art,
To enrich fair Britain, and to take her seamen's part!

Uprose the BEACON LIGHT, afloat, on rock, on strand,
On cliff,—the pride, the watch-fire of our land.

THE PRESENT.

Hail glorious emblem of good will to man!
Hail beauteous flame on scientific plan!
Hail splendid child of Nature taught by art,
To show the dangers of the seaman's path!
Shine on proud luminary, let thy brightest light
Beam radiant ever, through the realms of night!
Proclaim the honours of a Fresnel's name!
Nor let A. Stevenson's be lost to fame!
Be yours the post of danger, to reveal
The insidious rock, which leadsman must not feel!
Stand boldly forth, erect on cliff or strand,
The mark by day, by night sure sign of land!
The pride of science, guardian of our coast,
The seaman's friend, of learned art the boast!
In distant nations, scarcely known by name,
Dark are the shores, where yet thy friendly flame
Is still unseen; where yet barbarian bands,
Know not the blessings of our Christian lands!
Shine on fair beacon through long years of night,
Beam forth for ages, rays serenely bright!
Long as these islands last, the seat sublime
Of commerce, art, and science to the end of time!

THE CHANNEL LIGHTS.

I.

For England when, with fondly fav'ring gale,
From foreign climes, we joyful homeward sail;
Sweet is the barque, and sweeter still the breeze,
That wafts us on to those we love to please:
Joyous the crew, while merry dancing wave
Gambols along in gladdened haste to lave
With homage due the vessel's bending side,
As gracefully she stems the yielding tide!

II.

Who shall secure the well oft promised prize,
For land first seen by clear and prying eyes?
Full many a wistful glance, alas! in vain,
Has swept across the ever restless main:
At length, to far and newly quickened sight,
Appears the BISHOP'S steady blaze of light;
Fixed, proudly firm, upon the dangerous strand
Of Scilly's furthest, rocky, western land!

III.

And four miles onward to the eastern lands,
ST. AGNES tower majestically stands;
Illumes the horizon by *Revolving* ray,
Once in a minute with the light of day:
Artfully arranged with mirrors bright,
Careful to use each particle of light:
As fair twin sisters at their vigils, stand
These outward beacons of Great Britain's land.

IV.

Here let the Muse her humble tribute pay
To memory of those who early passed away
In duty's thorny path; to them a snare,
Were Scilly's dangers with their coal-fed glare!
Ere these fair lights broke o'er the misty plain
Of surging seas on Scilly's rocky main,
Sir Cloudesley Shovel and his gallant band
Of seamen, perished on that fatal strand!

V.

Far more than they! but let us gladly turn
From scenes 'twere useless, idle now to mourn.
'Twixt Scilly's rocks and Britain's West Land's-End,
In case of need the seaman to befriend,
A channel lies,—midway a lonely barque
Bears a *Red* light, the SEVEN STONES to mark:
Insidious danger to the coasting trade,
East-north-east half east five leagues from Scilly laid.

VI.

More danger yet does this fair channel spoil,
The unwary bark to waylay and embroil
In direful wreck,—the WOLF ('tis justly named)
Lurks there for prey, as elsewhere he is famed,
In stealthy solitude; yet beacon'd plain to sight,
Eight miles South-east by south from Seven Stones light;
And from the Longships too, he likewise stands,
West by north three-quarters north five leagues from Cornish lands.

VII.

Next to St. Agnes in the roll of Channel Lights,
Staunch friends to seamen in the long dark nights,
The LONGSHIPS stands, a *Fixed* and steady flame;
One that's but little known to Channel fame,
For like a bashful maiden she retreats,
Unseen by ships that follow Channel beats;
Contented with her own she holds her sway,
The Seven Stones reflects, and keeps the Wolf at bay.

VIII.

Penzance we pass, nor heed her tidal flame,
Before us are others important more to fame:
The LIZARD'S *Fixed* lights stand some space apart,
Placed East-north-east and West-south-west by art:
From westward seen in line these safely clear
The ever dangerous Wolf, which thus no ship can near;
And from the eastward seen together as before,
The rocky Manacles lie harmlessly in shore.

IX.

Skilful arrangement, thus at once to save
From dangers East and West the hardy brave,
Who navigate the coast in small or fragile barque,
While far at sea they form the distant mark:
Next in succession, round the Lizard's shore,
Lies Falmouth, famed for packets now no more;
Where, thrice each minute, a *Revolving* light
Punctual ST. ANTHONY exhibits every night.

X.

While onward steering for the eastern sky,
A steady flame now meets the seaman's eye;
'Tis far from land, as if on ocean borne,
A tower appears, its base by surges worn
Stands proudly firm, and seems to say
To every billow with its surging spray,—
"Come one, come all, this rock shall fly
From its firm base as soon as I."

XI.

A rock that base! and pinnacled with light,
The EDDYSTONE named! aye, glorious sight,
Triumph of art,—monument of Smeaton's fame,
Mocking the fury of the restless main;
Calmly serene while storm-winds howl around,
Proof to the tempest's shock and wild waves bound;
Long may'st thou stand, that *steady* light to lend,
The Plymouth guardian and the seaman's friend!

XII.

Our western naval arsenal calls to mind
The days of Devon's worthies, when combined
Came foreign fleets fair England to subdue;
Yet sunk and shattered by a gallant crew
Of Britain's sons; heroes by a Howard led,
Rejoicing to pursue their enemies ahead!
Severe the conflict British valour won;
The storm completes what this had well begun!

XIII.

Let th' Armada's name with Plymouth be combined
In History's page, a lesson to mankind
On British valour! But there Earl Howard found
No Breakwater to enclose her Sound.
Slow in its birth, yet certain to defend,
With crimson flame to light its western end;
The Sound protected by this marble arm,
Becomes a harbour safe from Ocean's harm!

XIV.

Another rock, too, emulous of fame,
Would vie with th' Eddystone and honour claim;
Fails to reach the surface of the main,
Hides disappointed, a danger to remain,
Lurking for ships: This we the HAND DEEPS call,
With only four fathoms on it over all:
Another, too, the RUTS, of similar condition,
Is ready to send all ships unto perdition!

XV.

From th' Eddystone, the Hand Deeps in their wrath,
Are a good league, North-west three-quarters north;
While from them Plymouth light bears East-north-east,
Distant ten miles and a half at least:
Then from th' Eddystone the Ruts bear East by south,
Distant four leagues, a short half mile or so:
From them Plymouth light is North-north-west,
Distant nine miles and a half at best.

XVI.

Let us diverge now from our Channel course,
Or stay, while we on other theme discourse,
Our progress eastward; since reckoning fails,
And, in consequence of western gales,
Ushant, instead of Scilly, may be found
Ahead, by straying ships up Channel bound!
In which case they will northward haul
Instantly, to save their all!

XVII.

There's idle rumour with a rancorous tale,
Busy of late our seamen to assail,
With charges serious, and 'tis feared too true,
As many have had too much cause to rue!
The lead 's neglected,—the look-out likewise,—
And ships are lost for want of being wise
In commonest matters of navigation,
Much to the discredit of the British nation!

XVIII.

Still who's to blame? Aye, who shall say?
The grasping owner, or neglected way
Of sailing ships! But since to all
Appearance this will have an overhaul,
We leave it; content some advice to give
To careful seamen, who desire to live,
With due regard for those three Ls
That danger in any shape dispels.

XIX.

The chart consulted, it is plainly seen,
Our Channel Fairway lies between
Two parallels;—the southern a quarter and forty-nine;
The northern, ten miles northward of that line;
Within this tract, in longitude of Cape Clear,
The depth is eighty-four, or very near,
Between eighty fathoms and ninety-two,
With oazy sand, and shells in pieces too.

XX.

In the same longitude North of this,
The depth is less, the slimy oaze we miss;
While southward of it, the depth is more, Sir,
The bottom generally becoming coarser:
And westward, the water 's deeper, the oaze we keep;
While sailing eastward it is not so deep
Southward of Scilly, where there will be found,
Sixty fathoms, with shells and sandy ground.

XXI.

Yet, entering the Channel, it is always found,
That deeper water and coarser ground
Lies southward; while to the North prevails
A depth more moderate, which never fails:
Thus South of Lizard six leagues, are fathoms fifty,
And North of Ushant six leagues, there are sixty:
This at the entrance only, for East of Cape Barfleur
Such differences are found to be much fewer.

XXII.

The careful mariner mindful of his charge,
Engaged in business with the world at large,
At anchor lying, or under usual sail,
Working against, or running with the gale,—
Strictly preserves a vigilant LOOK-OUT,
Narrowly watches what his LOG 's about,
Danger anticipating, avoids it when ahead,
And when in soundings learns it with his LEAD.

XXIII.

He, with good judgment, studies well the tides,
Allows for springs, and eastern drift besides;
Is neither North near Scilly's dangers laid,
Nor yet midst Guernsey's fearful reefs embayed:
He knows full well the rise of thirty-seven feet,
Produces rapid drift which he must meet;
He knows all this is fraught with danger dread,
Seeks the North shore, but feels it with his LEAD!

XXIV.

The Channel entered and the Fairway gained,
The course is shaped as if no more remained
Than port to make, that is if wind admits,—
Yet happily for all the wind takes fits
And starts, and will not always blow,
As certain ships would always like to go:
For these it does not suit, for those it would,
Since "it's an ill wind that blows no one good!"

XXV.

If with the first you're for enrolling,
Depend there's nothing for it but the bowline;
And if Ushant you have seen, get northward
With all despatch, or you'll be bothered
'Midst reefs and races of the Channel isles,
Those well known dangerous ocean-wilds;
Where ships get driven, mostly to their cost,
And if not partially, are wholly lost!

XXVI.

Avoid them then, and keep the northern coast,
With wind at East; there's nought for you to boast
Of such bad company;—Look well out your lead
And Log;—the CASKETS you may see ahead:
And these consist of three *Revolving* lights,
Forming a triangle, obtuse by rights;
The longest side lying nearly East and West,
Sixty-two yards of rugged rocks at best.

XXVII.

Go not near them! Avoid them if you can!
They're Neptune's jewels, presented him by man,
To serve his sons, meant only to be seen
Thrice in a minute by their sparkling beam!
Well they light up the war of winds and tides,
With all their tumult among rocks besides:
Their bearings taken, never near them more,
But seek the safety of our northern shore.

XXVIII.

While yet we notice with admiring gaze
The Eddystone, which the Muse wants words to praise,
As if to increase the beauty of the scene,
The START delights us with his playful beam;
His varied light *Fixed* though faint to know
Within the range of some ten miles or so;
Is always seen, and every minute with *returning Flash*
The waves reflect it as they onward dash!

XXIX.

North-east of this light, some four miles or more,
The dangerous SKERRIES reach along the shore,
The seaman threatening; but with special care,
Measures are taken to protect him there:
Nearing their outer edge, let him beware,
South of west half south the Start light must not bear;
For 'twixt this bearing and South-west by south,
The light is screened, this shoal to disavow.

XXX.

Leave we the Skerries to those whom they concern,
While we up Channel take the usual turn;
Careful the Muse of features in her lay,
To note of lights that guide us on our way:
For Dartmouth, Brixham, Torquay, havens of the coast,
With Teignmouth and Lyme Regis, only *Red* lights boast;
Within the space of fifty miles to fill
The distance from the Start to PORTLAND BILL.

XXXI.

Time-honoured name, whose Race full many a year,
Is well known music in the seaman's ear;
Two bright *Fixed* lights now ornament that Bill;
The western higher overlooks the hill,
The lower eastward stands, five hundred yards between,
And South-south-west three-quarters west; when seen
In line, they justly serve to indicate the space,
That 's left between the Shambles and the Race.

XXXII.

To those who take with us the Channel course,
With offing large, "for better or for worse,"
The Shambles Shoal presents but small concern,
With broken shells arranged in step like form!
Suffice to know in case we near it more,
Two miles its length and distance from the shore:
From Portland South-east by south its West end nears,
And East-south-east half south its East end clears.

XXXIII.

Happy the day for England's future weal,
When her wise sons chose Portland's bay to steal
From Ocean's wide domain, and there to form
A refuge harbour from the fatal storm:
"Onwards methinks and diligently slow,
The firm connected bulwark seems to grow,
Spreads its long arm amidst the water's roar,
Scoops out a harbour, and usurps the shore!"

XXXIV.

Glorious conclusion! Yet surely there are more
Such bays along Britannia's sea girt shore,
Where by these works of "artificial pride,"
Her merchant fleets may yet securely ride!
She answers "Yes,—Dame Nature unto me
Has not been niggardly, and we yet may see
More, when England's sons shall live to be
Proud of such works for her prosperity!

XXXV.

"What to the Wagoner said Hercules of old?
'Your shoulder to the wheel,' was he not told?
And so they are done: 'twas wisely said
From these true words let statesmen look ahead
And multiply her harbours; they defend her fleets;
Shelter them in storms; in war are safe retreats;
While each one shows with merchants' flags unfurled,
That British Islands trade with all the world!

XXXVI.

Farewell to Portland,—soon may British skill,
Complete thy harbour from thy rocky hill;
Where safe from gales Britannia's fleet may ride,—
Her strongest bulwark from all hostile pride!
Three more *Red* lights we pass, though do not see,
The Breakwater, Weymouth, and Poole of small degree.
As onward up the Channel yet we steer
St. Albans passed, the Needles and St. Catherine's we near.

XXXVII.

Here let us pause ere further we are led,
For England's garden island now is seen ahead:
A handsome tower marks its seaward side,
Braving the tempest in its lofty pride;
Stands boldly forward on the chalky mound
Of fair ST. CATHERINE'S undulating ground;
Bearing with her name its splendid light,
A *Fixed* and steady flame throughout the night.

XXXVIII.

Turn we now landward, where a sound,
Leading to Portsmouth or Southampton 's found;
Critical to navigate, yet safe and still,
Relieved from seas and all their boisterous will;
Its western entrance is profuse of light,
And may be taken in the darkest night,
To Britain's sailor sons in yachts long famed,
Known for its rocks, the Needles aptly named!

XXXIX.

With entrance small, where pilot's watchful eye
Must see and meet the danger ere 'tis nigh;
Where one false move of helmsman's skilful hand
Will cast the ship on either fatal strand:
To avoid such danger let us clearly see,
What has been done by careful "Trinity"
Masters of old, whose every studious care
Was to protect the hardy seaman there.

XL.

Approaching this entrance of the Solent from sea,
Conspicuous first the NEEDLES light will be:
To pointed rocks of Nature's own conceit
Belongs the name,—the sea birds wild retreat,
Justly admired for their view sublime,
By seamen oft when bound for foreign clime:
One which he leaves a towering rock to sight,
When he returns he finds a tower alight!

XLI.

What freak of Art o'er freak of Nature too!
A rock transformed to a light of varied hue!
Illumined also on a peculiar plan,
Which mariners must take care well to scan:
The chief intention they will then perceive
Is a ray of *Fixed* and brightest light to leave
Between due West, upon the seaward hand,
And West-north-west to port, or next the land.

XLII.

The former bearing clears the Durlstone Head,
The latter the Shingles and the Dolphin's bed:
Between those bearings, the light being clearly seen,
Is boldly steered for under sail or steam;
And, kept a trifle eastward of the last,
The South-west Shingles will be safely passed
North of the Bridge; until the lights of Hurst
Bear East-north-east half north as here is versed.

XLIII.

"The lower light open of the higher," says pilot hoarse,
"A leetle on the port bow," gives the course
North-east by east, and leads with eye intent,
To the narrow entrance of the fair Solent!
But to the Needles light we'll now return,
For more conditions there are yet to learn.
Except in the bearings within which 'tis seen,
This light is quenched by red and darkened screen.

XLIV.

Red from West, Southward to South-east by east,
And from West-north-west, Northward to North-east by east,
Between which last and North-east by east half east,
By other ray of light the Solent 's reached:
This last leaves ships the island shore to edge,
Enabling them to clear the Warden Ledge:
And thus to all portions of the Isle of Wight,
The modern Needles tower denies its light.

XLV.

Mind then from sea the lessening lane of light,
'Twixt West and West-north-west to approach the Isle of Wight,
That ships must only use by day or night,
When for the Needles they would shape their course aright.
The two HURST lights in separate towers stand,
Some yards apart on Hurst's loose shingly strand,
Fixed, of unequal height, originally meant
When seen in line to lead to the Solent.

XLVI.

But Nature, who is ever fond of change,
Never consents to keep a constant range
Where tides in channels are concerned; and hence
They're open kept by ships that sail from thence.
More from these lights is claimed as rightly due,
Since they look Westward, South, and Eastward, too;
Hence from the *Lower* Tower through the Solent,
'Twixt East and East half south a ray of light is sent

XLVII.

That reaches Cowes, from whence is plainly seen,
The CALSHOT light in fair Southampton's stream,
Revolving once a minute, there to wait,
P. and O. steamer with her living freight;
Welcomed by friends upon SOUTHAMPTON PIER,
Where a *Red* light at sunset does appear:
RYDE and also SOUTHSEA lights are *Red*,
Beaming on England's roadstead famed Spithead!

To be concluded in our next, and to be had separate hereafter, with Notes, &c.

THE CONVENT OF LA RABIDA,—*An Historical Picture.—By M. G. de la Landelle.*

(Continued from page 65.)

The prior was astonished at the nature of the questions put by Ferdinand, who, after minutely examining the chart, pronounced in favour of Columbus.

"I thought," said he, "that you were going to deny that the world was a sphere. That is what has embarrassed me. For if the earth be round, there is necessarily a place opposite to ours where it is impossible to stay—even a ship sailing to it would gradually fall out of the sea, till at length she would fall into boundless space."

Columbus smiled at this. "No, no," he said;" the skies which surround the earth like a rind, keep us always on the surface. The progress of the sun proves that our world is a sphere: this is the opinion of learned men from the most remote times. Now a sufficient portion of this world is known to show that there is no risk in any part of it of slipping off, as one would from the side of a building. The feet of all the inhabitants rest on one of its radii, proceeding as

it were from the centre. When we walk we are like insects on an orange, which travel round it without deviating from their course."

The mind of the great navigator comprehended the problem of gravity, and that attraction, which was not completely resolved for two centuries later by Newton.

Columbus, who had now to deal with intelligent and honest men, demolished one after the other all the arguments advanced against his theory so thoroughly, that he won over the doctor and the prior to his opinion. New conferences followed this of the first night of their deliberations, while friends of the Doctor Fernandez at Palos increased the confidence of Juan Perez in the theory of Columbus.

Thus an old pilot present at one of the meetings stated that having been driven by foul winds far beyond Cape Clear of Ireland, he had encountered in the midst of the Atlantic a sea, into which he would have gone further if winter had not been at hand.

The traditions of antiquity were brought forward. The Atlantide of Plato, of Ophir and Tarsis, to which the fleets of Solomon sailed after passing the Pillars of Hercules, and it was questioned whether these places were situated in the empire of the Great Khan or in the island of Cipango.

The recent voyages of the Portuguese proved that the torrid zone had been passed without danger, and that it was not a fiery region, where the waves themselves were boiling, as some ancient philosophers had stated. Columbus himself had been as far as St. George del Mina, in Guinea, near the equator.

Juan Perez was satisfied, and from this time forth determined to espouse the cause of Columbus. Garcia Fernandez undertook to assist in finding for him a crew and companions for the voyage: and thus science and faith in the cause, provided the old mariner with two prudent and disinterested friends, determined to assist him all in their power, and not to lose sight of the object in view.

The prior had sent a messenger to Huelva. Pedro Correa, the brother of the great navigator, was found to be dead, and thus Columbus found himself bereft of his last hope and without resources in a strange land.

The convent of La Rabida became the home of young Diego, whilst his father, by the generous assistance of Juan Perez, obtained suitable clothing, that would enable him to appear at the Court of Castile. He was provided with a letter from the prior, recommending him to his friend Fernando de Talavera, Confessor to the Queen. Still the unsettled state of affairs of the peninsula prevented Columbus from setting out on his journey until the end of the year 1486, at which time, leaving his son Diego to the care of his excellent host, who promised to see to his education, Columbus took leave of him, and with anxious hopes set out for Cordova, at which place Ferdinand and Isabella were then staying.

The Spanish monarchy at this bright period of its history had been cemented by the marriage of the King of Aragon with the Queen of Castile, which royal pair formed one of the strongest governments

which had ever been known. A mortal strife had existed for eight centuries between the Christian and Moorish population. The invasion of the country by the Moors had been comparatively easy in overcoming a mixed population of Celts, Romans, Vandals, Sueves, and Goths, perpetually opposing each other, and by their mutual hatred preventing that cordial cooperation from which a state derives power. But the last descendants of all these peoples, formerly rivals, then occupied the mountains of the Asturias, having become leagued together against the common enemy of their faith, formed a powerful body, and in their turn adopted the offensive against their conquerors, favoured by the dissensions which had crept in among them.

In less than a century after the battle of Xeres, while the kingdom of Oviedo was formed on the Biscayan shore, Charlemagne had forced Islamism beyond the Ebro, and after him, notwithstanding their quarrels, they continued the war against the Califs.

Portugal conquered the country which belonged to her afterwards; the rest of the peninsula was finally divided between the crowns of Navarre, Aragon, Castile, and Leon, besides Granada. In fact, when John the Second of Aragon died, leaving the sceptre to his son Ferdinand; and Isabella was triumphantly seated on the throne of Castile and Leon, the power of Spain made her mistress of all the country she now occupies in Europe, with the exception of Upper Navarre and the Mahomedan possessions, where the Moors found themselves completely shut in, especially after they had lost Gibraltar, under Henry the Fourth, predecessor of Isabella.

Navarre was too weak to be feared; Portugal had been vanquished at Toro, France could cause no uneasiness, for affairs in that country were in fearful confusion, and thus strengthened by their union, which in every respect was desirable, notwithstanding the independence of their respective crowns, the King and Queen brought against the Moors the whole force of Christianity in Spain. The war was a veritable crusade: the chivalrous youth voluntarily flocked there from all parts of Europe, and despair was spread through the ranks of Boabdil when Granada prepared for an heroical resistance.

Jealous of their own glory, Ferdinand and Isabella were determined not to compromise their respective fames in an attack which would not ensure success; and hence they collected a formidable army to carry on the war to the very last of the Califs, when Christopher Columbus arrived in Cordova.

Isabella and Ferdinand learnt that the Moors, having thrown aside their internal divisions, had formed a coalition. It was time therefore to commence hostilities. Now it was in the midst of this state of affairs that a stranger, poor, and with no other recommendation than a letter from a Franciscan monk, desired to be heard. Juan Perez, already well known at Court, was meanwhile far away in a convent in Andalusia; he was all but forgotten, and his successor in the service of the Queen, Fernando de Talavera, would not condescend to listen to the unknown person who had come to him. He considered him an adventurer, treated the project of going to India by the At-

lantic as an extravagant and fanciful idea, and refused his concurrence in terms which annihilated every hope of Columbus.

But the unfortunate Genoese immediately set about obtaining an audience of the Spanish sovereigns. He employed his geographical attainments, and maintained himself by the produce of maps, which he sold to the gentlemen of the Court. In the life of a great man like Columbus, no episode is so trifling as not to afford interest. The sale of his maps placed him in communication with the preceptor of the royal princes; he was, moreover, the brother of the Pope's nuncio, and consequently of much greater importance. The preceptor spoke of his cosmography: what he said was repeated every where and soon Columbus was countenanced by the Bishop of Toledo, Don Pedro Gonzalez de Mendoza.

The illustrious prelates who felt an interest in the subject read the letter of Juan Perez, listened with attention to the arguments of the old mariner, and would convey his wishes to the throne. A year after his arrival at Cordova he was presented to Ferdinand and Isabella by the Cardinal de Mendoza, who has been called by an historian the Rosieme King of Spain in reference to his great power over the monarchs of Castile and Aragon.

Notwithstanding his naturally retiring character and his evident poverty, Columbus was never disconcerted. The lofty nature of his object inspired a corresponding character of language. He declared himself to be an instrument in the hands of Providence, and explained his view of the enterprise he had planned in such a manner as to produce an impression on the Queen. But Isabella considered it right that the question should be decided by her royal spouse.

Ferdinand, inspired at first with the desire of making more important discoveries than the Portuguese, still kept on his guard, and did not allow himself to be led away by the enthusiasm of the great navigator, so as to commit himself to any promise. He directed that an assemblage, composed of the most learned men of his kingdom, should consider the proposal, and sent him before this Council, the president of which was Fernando de Talavera.

Columbus had set his hopes on the power of the Queen, who had declined to support his cause alone, and he fell into the hands of a man who should already have been his protector, but by whom he had been repulsed. But he did not allow himself to be cast down by his bad fortune.

When he was before the Council of Salamanca, he answered triumphantly all the objections, often puerile and unguarded, that were raised against him; but, alas, genius could not prevail over the prejudice of the majority. These considered that the doctrine of Columbus was at variance with the Ptolemaic system. Some of them going further than this considered the very motive as heretical and impious, little considering that it sprung from a most pious desire to carry the words of Christianity to unknown lands; thus placing its author far above any suspicion of a want of faith, or of holding sentiments at variance with religion. If matters did not reach this point it was

owing to the higher branch of the priesthood, who were among his examiners and shared in his opinions.

Political matters interrupted the conferences of the learned assembly at Salamanca, and Columbus was forgotten.

Nevertheless, he followed the Court for five long years, consecutively taking his part with the army, with the hope of exciting the attention of royalty, giving proofs of his discretion and cleverness in the war with the Moors, and desiring as the price of his services nothing more than to give a new empire to Spain and Christianity.

In the course of the siege of the town of Baza, at which he assisted, an incident occurred which deserves notice for its extraordinary but almost unknown influence on the project of the illustrious navigator, transforming the discovery of the New World into a crusade, having for its object the conquest of the Holy Land,

The alliance of the rival Kings of Grenada was broken. Muley Boabdil occupied the town of Baza, while his nephew, Mohammed, looked to the discord in the capital of the Moors. Taking advantage of this state of things, the Spaniards directed all their efforts against the former place, when two monks from Jerusalem arrived at the camp. Isabella was attending the progress of the siege in person.

The two monks were the bearers of a message from the Soldan of Egypt, who threatened to destroy all the Christians in his country and the Holy Sepulchre also, if the King and Queen did not renounce the conquest of Granada. The monks also spoke of the sufferings of their brethren among the Musselmans, of the persecutions which they had undergone, and the sad condition of the brotherhood.

Isabella, who was much affected by their statements, granted an allowance to the guardians of St. Sepulchre, a thousand ducats of gold, and presented a veil worked by her own hands to the shrine. But the war was continued with redoubled ardour.

The Spaniards, filled with pious indignation at the threats of the Soudan, thirsted to revenge the oriental Christians, and performed prodigies of valour, while Columbus was so much excited by the reports of the monks, that one morning he exclaimed with fervour, "I swear to consecrate to the deliverance of the holy sepulchre all the benefits that I shall derive from my discoveries."

Such an exclamation from a poor volunteer of the catholic army wore the aspect of mockery, and Columbus was then considered as a kind of adventurer, whose mind was unhinged by his long application to scientific pursuits.

How often the old mariner was taunted by the young hidalgos of the Court, notwithstanding his bravery and his military attainments. But the monks of Jerusalem followed up their story, and described as something dreadful the sufferings of the Christians in the Levant; and Columbus no doubt repeated inwardly the oath he had taken, and which he did not forget to the day of his death.

It was owing to the good judgment of Isabella that the siege was so well conducted that Baza was soon obliged to surrender. Muley Boabdil yielded his claim to the throne in favour of the King and Queen.

The Court returned in triumph to Seville, and Columbus longed for the arrival of the hour when he shonld obtain a decisive answer to his cause. But the rejoicings rendered it more difficult for him to see the Queen than the war, and two long years more were passed by him in the most trying state of suspense in the expectation of an audience.

In 1490, when he considered that he was at length making himself understood, all he could obtain was no more than a vague promise. Fernando de Talavera told him that he could not make any engagement with him until the conclusion of the war.

With sorrowful feelings but not cast down, and yet with bitterness at heart, although convinced of the worthiness of his design, Columbus left Cordova to make proposals to the Dukes of Medina Sidonia and Medina Cœli, grandees of Spain, in possession of flourishing principalities, who had ships and kept troops independent of the crown. But they both declined to assist him in his enterprise. On which the old man decided on leaving Spain, and on returning once more to the convent of La Rabida, and look after his son Diego.

(To be continued.)

Maulmain Port Regulations.

Maulmain, October 15th, 1858.

Dear Sir,—When in London lately, I was asked by several parties, what became of all the ships that went to Maulmain? One half of them appear never to return. I could not answer the question; but on looking over a list of vessels that had sailed for this port, sure enough a great many of them were not accounted for, although long overdue. Being considered an authority on Maulmain matters, and accepting the compliment, I must have looked somewhat foolish, and certainly felt very uncomfortable at being put to a stand by so plain a question. I think, however, I can answer it now, and with your permission will do so through the *Nautical Magazine*, trusting that it may come under the eye of my querists and others who may be interested in the information.

There are at this present time more ships in this port than ever was known to be before. But on looking over the harbour, I observe a great many dismantled and evidently not at work. Now as this is not a shipowning port where vessels are laid up at their home, the inference is, that some untoward cause must be at work to account for so many of them lying idle, and we may safely say at a loss to some one or others connected with them. This led me to make further inquiries, the result of which I beg to subjoin in a list of "cripples," procured from the port office, for the information of those concerned.

There were 483 vessels from over sea entered this port within the period embraced in the list; and in examining the cause of detention it will be found that of those detained only seven arose from accidents in the river, and of those seven only five were under tow of steam, or, shall we say, had a fair chance for their lives, as steam is now the rule for all rivers, and in none is it more necessary than Maulmain.

Admitting no complaints against Maulmain that I can gainsay, I must fairly confess that our river is very bad; the best that can be said of it is that it is very short—only twenty-five miles from sea to the harbour. The channels are narrow and tortuous, but deep enough in spring tides for anything; hence the only safe mode of navigation is by steam towage. The coast is all clear to the *southward* of the river's mouth, and I confess to have always looked with suspicion on vessels that have got into difficulties *there;* and no vessel has any business to the northward of Amherst unless seeking destruction. But these are matters for underwriters to look into; and if they do so properly I have no doubt but they will find a Maulmain risk as safe as any other river.

I may mention, however, that there is a talk of placing a light-house on Amherst Point, a position that will lead ships to a bad anchorage and a leeward tide of seven knots, with a heavy swell, and the Godown Sands and Sittang River Bar under their lee. If this ill-considered scheme is carried out, premiums of insurance on inward bound ships should be doubled, to meet the danger. If a light is required at all (which I don't think it is), Double Island or Calegouk would be the proper place for it, being to *windward* and out of the influence of the tide, where a ship could keep her position without anchoring until the pilot be on board; and in nineteen cases out of twenty would not anchor outside at all, which is the better plan; but, if need be, she may anchor in any convenient depths between Calegouk and Double Island, where there is comparatively little tide. Whereas to the northward of Double Island, and all in the vicinity of Amherst, the tides run like a sluice, increasing in velocity as you get to the northward, where no ground tackle can be expected to hold. In fact, with the exception of the Sandheads of the Hooghly, I know no worse anchorage than the neighbourhood of Amherst during the S.W. monsoon, or say from April to October, inclusive, and I repeat again that ships need not anchor there unless they like.

By the way, I may mention that by a late regulation the pilot service has been thrown open to the public, and pilots' earnings now depend on the amount of work done,—a decided improvement in many respects, and especially so in the spur it gives them to "board first."

I enclose the Port Regulation in case you have not seen it before.

I am, &c.,

J. H. MILLER.

To the Editor of the Nautical Magazine.

List of Ships Detained by Accidents and other causes at Maulmain from January 1st to September 30th, 1858.

Chesapeake, Gossypium, and *Amherst,* put back, condemned, and sold.

Thetis, put back and laid up for repairs.

Emily Apel and *Emilia,* put back, sold, and repaired.

John Mitchell, Hamburg, Launceston, Bona Dea, Portia, Stamboul, and *Hope,* laid up for repairs.

Minnie Lonsdale, in dock, lengthening.

Eos and *Gottingen,* grounded in the river, repaired, and sailed.

Great Britain, undergoing repairs.

Shaw in Shaw, Vencatareddy, Naiad, Viceroy, and *Fortescue,* put back, laid up.

Elizabeth, repaired and loading.

Albyn, put back and sold.

Marian, laid up.

Leodes, Alexander Baring, Lavinia, Superior, and *Elenore,* condemned and sold.

Ann Bridson and *Skelleftea,* grounded in the river and laid up for repairs.

Parisian, repaired and gone to sea.

Forest Oak, grounded in the river, repaired and loading.

Lord Harris, collision in the river, repaired, and sailed.

Mary Seaton, wrecked on the coast.

Damstadter Bank, grounded in the river and laid up.

Rules for Pilots and Pilotage, Maulmain River.

1.—Licences will be issued by the Master Attendant, under the authority of the Commissioner Tenasserim and Martaban Provinces, to such applicants as may be deemed qualified, for pilots on the Maulmain River by a Committee convened by the Master Attendant, under the direction of the Deputy Commissioner.

2.—The committee shall be composed of the master attendant, as president, and three members, two of whom shall be commanders of vessels, and the third the government pilot, or a licensed pilot, as available.

3.—The qualifications of pilots shall be a knowledge of general seamanship, the capability of giving orders in the English and native languages, a competent acquaintance with the Maulmain River and the channels leading thereto, and the production of certificates of previous good conduct and sobriety.

4.—On a candidate being reported qualified by the committee, he will receive a licence under the signature of the master attendant, and will then act under these rules.

5.—The ordinary place for a pilot to board or leave a ship outside, will be half a mile to the southward or to the westward of the patch or outward buoy.

6.—Every pilot is required to produce his licence and engagement (if any) to the master of any vessel requiring a pilot, and is to hoist his pilot flag at some conspicuous place while he is in charge. The pilot flag to be four feet square, red and white, horizontal for European pilots, and vertical for native pilots. The number of the pilot's licence to be on the flag in distinct figures of two feet in length.

7.—If a pilot who is unengaged passes an inward or outward bound vessel, having a signal for a pilot flying, without boarding such vessel, or who may demand or receive a *higher* or *lower* rate of pilotage than he is entitled to under these rules, will be liable to have his draught reduced or licence revoked.

8.—A pilot leaving a vessel without the consent of the master is liable to have his draught reduced or his licence revoked.

9.—The pilotage charge of the whole distance is as follows, subject to certain modifications, viz.:—

Boarding or leaving to the westward of the Patch or outer buoy.....	Full Pilotage.
Boarding or leaving between the Patch and Reef buoys	3-4ths ,,
Boarding or leaving to the eastward of the Reef buoy	2-3rds ,,

10.—Scale of full pilotage for Maulmain River, distance from town to Patch Buoy, thirty miles:—

Draught under	8 ft.	25	Rupees.	Draught under	15 ft.	125	Rupees.
,,	9	35	,,	,,	16	145	,,
,,	10	45	,,	,,	17	165	,,
,,	11	55	,,	,,	18	200	,,
,,	12	65	,,	,,	19	240	,,
,,	13	85	,,	,,	20	300	,,
,,	14	105	,,	,,	21	360	,,

Every additional foot to be increased by sixty rupees.

11.—The rate for intermediate portions of a foot is to be regulated as follows, viz., three inches and under, no addition; between three inches and nine inches, the medium between the two rates; above nine inches, the draught of the next foot to be taken.

12.—Vessels taking steam aid to be charged two-thirds of the rate for sailing vessels.

13.—Steamers under fifteen feet, one-half the rate of sailing vessels; above fifteen feet, three-fifths of such rate.

14.—Vessels not taking licensed pilots, and above 100 tons, will be charged by government at the rate of one anna per register ton.

15.—The charge for shifting of a berth in the port, or for removing a vessel, shall be twenty-five rupees.

16.—Vessels that call for orders or put into Amherst in distress, and proceed in and out without a pilot, shall be exempt from Rule 14.

17.—A pilot may be detained twenty-four hours after arrival off town without demurrage.

18.—The pilotage distance is divided into fifths, for charging broken or intermediate pilotage, but the least sum payable to a pilot for taking a vessel in or out of Amherst will be twenty-five rupees:—

From outside Patch Buoy to Amherst Inner Roads ...	1-5th.
From Amherst Inner Roads to Fishing Village	1-5th.
From Fishing Village to Half Way Creek	1-5th.
From Half Way Creek anchorage to Natmoo anchorage	1-5th.
From Natmoo anchorage to off Maulmain	1-5th.

19.—Every licensed pilot that brings a vessel from sea to town is entitled to have the pilotage charge of such vessel outward, if he is available twelve hours previous to her intended date of departure.

20.—One licensed pilot cannot supersede another licensed pilot, unless such pilot is unable to proceed with his charge from sickness, or from having an under draught licence.

21.—Every licensed pilot shall report his arrival in town to the master attendant, and deposit his certificates in the office, and every licensed pilot shall report himself daily at the master attendant's office while such pilot is in town.

22.—Pilots are to moor all vessels in such berths as the master attendant shall appoint, with not less than thirty fathoms of cable each way, before discharge.

23.—Pilots who may ground vessels are, as early as possible, to report the occurrence to the master attendant, in writing, specifying the place and time, state of the weather, direction and force of the winds, time of tide when out of danger, extent of damage, and every other particular as may be deemed useful. This report to be certified by the master.

24.—When anchors or cables are lost, the pilot in charge will report the occurrence in writing, specifying the time and place, time of tide, size of anchor and chain, quantity of cable, buoyed or not, and the bearings of the nearest well known objects ashore.

25.—Every pilot holding a licence who observes any alteration in any of the sands or channels, or that any buoys or beacons are driven away or injured, shall, as soon as possible, report such in writing to the master attendant.

26.—Pilots noticing any infringement of the Port Rules, or any of the provisions of the Act XXI of 1855, are to report the same at once to the master attendant with particulars in full.

27.—The pilots are to pay the strictest attention to the orders of the master attendant.

28.—For any proved incompetency or misconduct of a pilot in connection with his duties, he shall be liable to have his draught reduced or licence revoked.

29.—A table showing the names of pilots licensed on the Maulmain River, with their respective draughts, is to be exhibited in the master attendant's office, for the information of the public.

Demurrage Rules.

1.—Commanders of vessels requiring a pilot are to give notice by signal forty-eight hours previous to their clearing out.

2.—If, having obtained a pilot, a vessel be not prepared to leave,

and do not move from her moorings on the date notified by the commander to the master attendant, and should the services of the pilot then in consequence be dispensed with, the commander of the vessel shall pay to such pilot, if he be a pilot licensed to convey vessels of full draught to sea, the sum of Company's rupees, fifteen; if he be a pilot licensed to the conduct of vessels of lesser draught, the sum of Company's rupees ten.

3.—If, after having obtained a pilot, a vessel be not prepared to leave, and should she not quit her moorings, and the pilot be detained on board, the commander of the vessel shall pay to such pilot, should he be a pilot licensed to convey vessels of full draught to sea, the sum of Company's rupees fifteen for every day of his detention; and if a pilot licensed to the conduct of vessels of lesser draught, the sum of Company's rupees ten for every day of his detention.

4.—Always, be it understood, that the detention adverted to in the foregoing paragraphs has not arisen in consequence of the desertion of the seamen, or from wind, tide, or weather, which could not be foreseen, or over which the commander had no control.

5.—In detention in port from desertion of seamen, the pilot cannot be detained more than twenty-four hours without the usual demurrage.

6.—If a pilot be detained on board a vessel out of the limits of the port of Maulmain, by the desertion or misconduct of its seamen, or any unforeseen casualty over which the commander could have had no control, the pilot shall be bound to remain with the vessel, without receiving any extra remuneration, for the space of forty-eight hours; after which time, should his further detention continue, occasioned by any other cause whatsoever than that of the prevailing wind, tides, and weather—for delay owing to which no claim shall hold good,—the commander of the vessel will pay such pilot, if he be a pilot licensed to convey vessels of full draught to sea, the sum of Company's rupees fifteen for every day of his detention; and if he be a pilot licensed to the conduct of vessels of lesser draught, the sum of Company's rupees ten for every day of his detention.

Notification.—19*th October*, 1857.

With the sanction of the Governor General of India in Council, it is hereby declared that the port of Maulmain and the navigable river and channel leading to that port, are subject to Act XXII of 1855.

The limits of the said port of Maulmain are as follows:—

To the North, a line drawn across the Salween River from the great Martaban Pagoda to the boundary pillar at the junction of the Attaran and Salween Rivers.

To the South, a line drawn from the boundary pillar at the mouth of the Kyouktan Creek to the boundary pillar on the island of Beeloogyoon, immediately opposite. So much of the Martaban branch of the Salween River as lies to the East of a line drawn from the great Martaban Pagoda to the boundary pillar on the North-East corner of the island of Beeloogyoon.

The limits of the said port include to the East and West so much of the River Salween and of the shores thereof, as are within fifty yards of high water mark spring tides.

The limits of the navigable river and channels leading to the said port of Maulmain made subject to the said Act are as follows:—

To the North, the port of Maulmain as above defined.

To the South, a line drawn from Double Island to the western shore of Beeloogyoon.

Port Rules.

With the sanction of the Governor General of India in Council, the following port rules have been made, and are hereby promulgated for general information and guidance.

1.—No vessel of above 200 tons shall enter within the limits of the port of Maulmain, or move from one place to another within the port between sunset and sunrise, without the special permission of the master attendant, and the commanders of all vessels arriving at the port of Maulmain, are desired to enter correctly, in the columns of the report book of the master attendant, as soon as presented to them, the information therein required regarding their vessels. They will also report in writing to the master attendant, forty-eight hours before their departure, the particulars noted in the form appended hereto.

2.—All vessels within the port of Maulmain shall be bound to take up such berths as may be appointed for them by the master attendant, and shall change their berths or remove when required by such authority.

3.—All vessels within the port of Maulmain shall on the requisition of the master attendant, rig in their jib and driver booms, and shall strike their yards and masts if required so to do by that officer.

4.—Every ship or vessel within the port of Maulmain shall remove any anchor or spar or other substance projecting from her side when required to do so by the master attendant.

5.—Vessels taking in or discharging ballast or any particular kind of cargo within the port of Maulmain, shall be bound to take up such berths as the master attendant may direct.

6.—A free channel of 240 yards wide is to be kept for ships moving up or down the river within the port, and also free passages to piers, jetties, landing places, wharves, quays, docks, and moorings, and all vessels shall be bound to move when required to clear such channels or passages.

7.—All vessels within the port of Maulmain shall anchor, moor, and unmoor when and where required by the master attendant.

8.—All vessels within the port of Maulmain shall be moored or warped from place to place as required by the master attendant, and no vessel shall cast off a warp that has been made fast to her to assist a vessel in mooring without being required so to do by the pilot or officer in charge of the vessel mooring.

9.—No vessel shall use any of the Government chain moorings, whether fixed or swinging, without permission of the master attendant.

10.—All vessels occupying Government moorings, fixed or swinging, shall be liable to pay for the same according to the following scale, but no more:—

For fixed moorings.		*From 1st Nov. to 31st May, being 7 months.* *Per diem, rupees.*	*From 1st June to 31st Oct. being 5 months.* *Per diem, rupees.*
All vessels up to	199 tons	1	3
Ditto	from 200 to 299 ,, ...	2	4
Ditto	300 to 399 ,, ...	3	5
Ditto	400 to 499 ,, ...	4	6
Ditto	500 to 599 ,, ...	5	7
Ditto	600 to 999 ,, ...	6	8
Ditto	1000 and upwards ..	8	10
Swinging moorings		3	4

11.—No vessel within the limit of the port of Maulmain shall boil any pitch or dammer on board or shall draw off spirits by candle or other artificial lights.

12.—All vessels within the limits of the channels leading to the port of Maulmain shall, when at anchor, between sunset and sunrise, have a good light hoisted at the starboard fore-yard-arm; and all vessels under way at night shall show a good light at the fore royal or upper fore mast-head, and when under way, in tow of a steamer, shall in addition to the mast-head light, show a good light at each fore yard-arm, the steamer showing the usual light prescribed by the Admiralty regulations.

The provisions of sections XII., XXVIII., XXXVII., and XL. of the said Act, No. XXII. of 1855, are hereby specially extended to the port of Maulmain.

The Port of Camaret—*near Brest.*

[While we are busy considering the harbours of our coasts with a view to their formation for refuge, it will be seen from the following that our friends across the Channel are similarly occupied in proposing to supply what Nature has left undone,—to make up in fact her deficiencies to their own advantage. The reader must bear in mind that the writer is a French citizen, addressing the *Moniteur de la Flotte.*]

On leaving the harbour of Brest by the South channel, and after passing the fort on Point Capucius, about half of the extensive bay of Camaret is seen, its extremity terminated by the rocky point of Toulinguet. At the bottom of the bay are perceived the roofs of the village from which the bay derives its name. The coasts present a curious but striking appearance. First are seen cliffs of a bright red hue, crossed with streaks of a light yellow colour, denying all chance

of safety to vessels in danger: a little further, a shore sloping to the sea, terminating in magnificent sands, broken here and there by huge rocks of fantastic form, their black irregular summits sometimes sharp and jagged and sometimes even, standing in the sands like huge sentinels of a former world, placed there to intercept the continual encroachments of the sea.

Near Camaret, and as far as the point forming the opening of the shores of the Grand Gouin, the cliffs reappear and form a succession of bare and arid downs, covered by a stunted pasturage, affording a poor nourishment to some wretched lank sheep, continually expressing by their plaintive moaning a desire for something better than such bitter food.

From the sand of the Grand Gouin to the Point Toulinguet, the shore becomes sandy. Some yards beyond it a huge rock of conglomerate kind, hollow in the middle, and forming a pillar on each side, connected by a kind of cornice, presents a curious combination of forms, resembling those of the old doors of fortified houses in the beginning of the middle ages.

The little town of Camaret, seated on the S.S.W. part of the bay, is formed by a collection of houses, irregularly built, leaving alleys between them, dignified by the name of streets; streets before and streets behind. But the simple-minded natives of this port have not been able to find any more appropriate names even for their roads. The priest's dwelling is at some distance from the port, and is approached by a walk planted with trees, and stands close to a large pond of salt water communicating with the sea.

The port itself, nearly in the form of a trapezium, the largest side of which is that containing the quays of the town, opposite the promontory of Trez Kouz, which forms the second side, has the natural dyke of Roch Madour. This dyke, which is several yards above the highest tide, has at its extremity near the chapel of Notre Dame de Roch Madour, a small fort with moats and a drawbridge. A few yards from this defence, the beginning of a dyke, intended, it is said, for the shelter of vessels in the roads, shows a half finished towering work, like a bar of iron deprived of half its length. The depth of water in the port only allows access to vessels of 150 or 200 tons, and drawing less than 12 feet. Vessels of much less draught than this cannot at all times approach the quays. The bottom is good holding ground, consisting of mud and sand, with weeds here and there, and affords good shelter from every wind excepting the North; with this wind tide-rips are frequent, in consequence of the situation of the port, and the very slight increase of depth from its entrance up to the quay.

That part of the bay situate at the entrance of the port and forming the harbour, affords good anchorage in various depths, with any wind from West to East by the South. The prevailing winds in the fine season are, N.W., N.E., and S.E.; but towards the equinoxes and during winter severe northerly gales are common in the bay, bringing destruction and wreck to those vessels which are unable to

take refuge in the port. These visitors are unhappily so frequent at this little place, that they keep the natives in constant fear of them, having left many grievous remembrances of their effects among the families of the hardy race of fishermen there. A shore strewed with wreck and drowned crews, keeps alive in the imagination a terrific sea breaking over rocks, and expending its fury on the shore.

At any moment in such a storm a vessel may drag her anchor, and from that moment the practical man calculates, with a feeling of despair, the moment when his vessel after striking will be dashed in pieces by the fury of the sea; since nothing then can avail,—destruction is certain, and death inevitable!

And yet under such perilous circumstances the fishermen of Camaret, although aware of the certainty of their own danger, have many a time saved the lives of the shipwrecked persons found clinging to the masts of their vessels, driven on the rocks by the wave, which only recedes with them from the same to hurl them back with still greater force.

Under circumstances of so fatal a nature, the bay of Camaret being open to the northward, it would appear should be avoided as a dangerous place. But this is far from being the case. Every year from 1,500 to 1,800 vessels are to be seen there, some waiting for a favourable wind to run up channel, or to the mouth of the Seine, others at anchor, refitting, or taking in water and provisions, or waiting to refresh their crews in harbour a few days from the fatigues and privations of a long and difficult voyage. The form of the coast is such that at the Ras de Seine, North of the Channel du Four, no shelter is afforded to coasters detained by the wind or weather, and here, therefore they are obliged to take that refuge denied elsewhere.

In order to remedy such a deplorable state of things, we have, up to the present time, done very little. The first improvement should be to clear the harbour; its depth should be increased to 24 feet, in order that it might receive large vessels in bad weather.

The Salt Lake, intended by nature for the continuation of the port, presents an admirable area, formed as it is by nature, and destined some day to contribute at small cost its addition as a magnificent harbour.

The dyke already commenced when continued should take a more southerly direction, so as to be between the breakers and the vessels at anchor at the entrance of the harbour.

This important refuge harbour will become by these works one of incalculable value, and will be the most frequented place along the shore by coasters between Dunkirk and Bayonne; if necessary a toll might be levied on all vessels anchoring there, which would soon raise the sum to be laid out.

At Camaret each of the inhabitants possesses a spot of ground in the mountains, which he cultivates himself; the produce of the fisheries, both of fresh fish and sardines, is sufficient in average years for his support. But his life is one of exposure and hardships. Scarcely is he a few years old when he embarks as boy in his father's vessel, and

remains there till the age of twenty; he then serves the State for the period that he is claimed, returns home, marries, and begins in his turn the trade of fisherman for himself, in which he continues until overtaken by age he is obliged to depend on his children for support. His indeed is a laborious existence; but beset with imminent danger, and often terminated by the death of a whole family from the fury of the sea. The fisherman is well accustomed to these strifes with the ocean, where, nevertheless, the stake contested for is his own existence. He seldom thinks of the morrow: living on little, he only thinks of himself, and the future to him does not extend beyond the next day's fishing.

Life-Boat Expenses.

During the past year the Royal National Life-boat Institution has incurred the following expenses, on either additional new life-boat stations, or the replacing of old boats, transporting carriages, and houses, by new ones: Norfolk—Cromer, £276 16s. 5d.; Mundesley, £223 9s. 5d.; Bacton, £377 11s. 11d.; Palling, £272 17s. 6d.; Winterton, £400 5s. 11d.; Yarmouth (two boats), £859 3s. 5d. Suffolk—Lowestoff, £153 14s. 6d.; Southwold, £127 19s. Berwick, £73; Boulmer, £73; Alnmouth, £41; Whitburn, £247 1s.; Hornsea, £44 12s.; Exmouth, £140 1s.; Appledore, £44 12s.; Aberdovey, £138 3s. 1d.; Rhyl, £52 17s.; Penmon, £72 15s.; Fleetwood, £140 1s.; Fraserburgh, £252 9s. 2d.; Lossiemouth, £140 1s. Ireland—Newcastle, County Down, £282 7s.; Dundalk, £191 1s.; Kilmore, £140 1s.; Carnsore, £187 8s.; Tramore, £322 18s. 9d.; Dungarvan, £191 1s.; and Ardmore, £81 11s. 5d.

The Institution has also expended on the repairs, stores, alterations, and inspection of its numerous life-boats, boat-houses, and transporting carriages, £2,714 5s. 3d., making altogether a total of £8,265 3s. 2d. It has also granted, during the same period, £952 as awards for saving 427 persons from 64 wrecks on our coasts. A most satisfactory result, and clearly showing how much has been accomplished by the well directed efforts which the Life-boat Institution has brought to bear on this humane cause. This great and national work has, however, only been accomplished by involving the society in liabilities to the extent of £3,047 beyond the expenditure of £1,000 from its small reserved capital.

Impelled by every feeling which we hold dear, to save a fellow creature from an appalling death by shipwreck, one would suppose that the National Life-boat Institution had claims which came home to the hearts of every one and there pleaded for support and sympathy; and most particularly does this apply to the United Kingdom, which is so much indebted for so large a portion of its greatness and

prosperity to its hardy seamen. In respect, then, of the Life-boat Institution, its objects being so truly national and philanthropic, we do not hesitate to recommend it earnestly, and on all occasions, to the support of those who are able to render it. That help was never more needed than at present, when, through the extraordinary exertions the society has made within the past few years, it has now eighty-one life-boats under its management. To maintain these boats in a state of thorough efficiency, a large permanent annual income is absolutely needed, if its humane mission is to be perpetuated. We feel assured that after this plain statement of facts relative to one of our most useful societies, we shall soon have the pleasure to report a very large increase to its permanent income.

LIVES SAVED FROM SHIPWRECK.—The following is an interesting fact of the number of persons saved from shipwreck, through the instrumentality of the life-boats of the National Life-boat Institution, and other means, and for rescuing whom the society have granted honorary or pecuniary rewards. In the year 1824, 124 lives were saved; 1825, 218; 1826, 175; 1827, 163; 1828, 301; 1829, 463; 1830, 372; 1831, 287; 1832, 310; 1833, 449; 1834, 214; 1835, 364; 1836, 226: 1837, 272; 1838, 456; 1839, 279; 1840, 353; 1841, 128; 1842, 276; 1843, 236; 1844, 193; 1845, 235; 1846, 134; 1847, 157; 1848, 123; 1849, 209; 1850, 470; 1851, 230; 1852, 773; 1853, 678; 1854, 355; 1855, 406; 1856, 473; 1857, 374; 1858, 428. Total, 10,903.

THE P. AND O. STEAMER "MALTA,"—*Effect of Length.*

The *Malta*, in consequence of the alterations which have transformed her into a handsome screw, is now not only the fastest of the Peninsular and Oriental Company's fleet, as proved alike in a sea voyage and trial trip, but she has obtained in speed an increase of 50 per cent., a fact of the highest importance when considered in relation with the Australian packet service, the contract for which has been taken by the Peninsular and Oriental Company, who have given this proof of their desire and determination to carry it out with credit to themselves and advantage to the colonies and the mother country, by increasing the rapidity of communication between the two, a consummation the realization of which seems fairly within the reach of a company which boasts of a fleet of vessels of an aggregate tonnage ot 80,000 tons, and about 18,000 horse-power. They have dispatched the *Salsette* and *Northam*, two of their fastest ships, and the *Malta* is to follow in January next.

The following figures show the former dimensions of the ship when a paddle-steamer, and her dimensions since the alterations:—

	As a Paddle.	*As a Screw.*
Length between perpendiculars	209 feet	285 feet.
Beam (between paddles)	35 „	38 „
Ditto (over sponsoons)	39 „	
Depth of hold	21 „	29 „
Tonnage	1,225 tons	2,020 tons.

The remarkable results accomplished when under the pressure of a trial trip have been subsequently sustained in a passage, which, in connexion with screw steaming, is without parallel, from Southampton to Alexandria and back, as shown by the following statement:—

	Distance. *Miles.*	*Time.* *h. m.*	*Speed.* *k. frns.*
Southampton to Gibraltar	1,151	95 44	12 0·2
Gibraltar to Malta	981	81 30	12 0·3
Malta to Alexandria	819	65 30	12 4
Total	2.951	242 44	
Average speed from Southampton to Alexandria			12 1·2
Alexandria to Malta	819	64 0	12 6·4
Malta to Gibraltar	981	80 5	12 2·1
Gibraltar to Southampton	1,151	118 15	*9 5·9
Total	2,951	262 20	
Average speed from Alexandria to Southampton			11 2
Average total of whole voyage	2,902	505 4	11 5·5

Besides these results, the *Malta* was subjected to the test of an Admiralty trial, at Stokes Bay, on the 30th ult., when she accomplished on the

1st run with tide	15·000 knots.
2nd „ against „	12·811 „
3rd „ with „	15·319 „
4th „ against „	12·950 „
Mean speed	14·020 knots.

Contrasting these achievements with the speed obtained in the same waters by the fastest and finest screw-steamers afloat, the result shows the superiority of the *Malta* as a screw-steamer, as exhibited by the following comparison:—

	Knots.		*Knots.*
Malta	14·02	*Pera*	12·63
Himalaya	13·90	*Candia*	12·44
Northam	13·44	*Nubia*	12·14
Simla	13·35	*Alma*	12·13
Ceylon	13·34		

* From Gibraltar to Southampton the *Malta* had to contend with a head gale.

Nautical Notices.

Particulars of Lights Recently Established.

(Continued from page 110.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
1. Needles Rock *(a.)*	Entrance	Isle of Wight	F.	80	14	Est. 1st Jan., '59. A red and white light screened thus at the tower:—From S.E.b.E. to West, *red*. From West to W.N.W., white. From W.N.W. to N.E.b.E., *red*. From N.E.b.E. to E.N.E.½N., white. E.N.E.½N. to S.E b.E., dark. Red light visible 8 miles.
2. St. Ives Bay	Godrevy Isl.	Cornwall	Fl.	120	16	Est. 1st March, '59. Light-vessel to be removed.
Stones	.....	.....	..	25	..	Beacon placed in lieu of buoy. with Godrevy light S.b.E.½E.
3. Shambles Sh.	Off Bill of Portland	Coast of Dorset	F.	..	..	Vessel off East end. About 1st Sept. next.
4. Offer Wadham Island	Ent. Sir C. Hamilton Sound	Newfoundland	F.	96	12	Est. 4th Oct., '58. 49° 36½′ N., 53° 46′ W.
5. Villa Joyosa	38½° N., 0° 11·6′ W.	Spain, S. Cst.	F.	52	5	Est. 20th Feb., '59. Present light to be discontinued.
Port Soller	39° 48·1′ N., 2° 43·6′ E.	Majorca	F.	468	15	Est. 20th Feb., '59.
6. Charleston Harbour	Mt. Pleasant	S. Carolina	F.	57	10	Est. 1st Jan., 59.
Fenwick Isld.	38° 27′ N., 75° 3·5′ W.	C. Delaware	Ff.	86	15	Est. 1st Aug., '58.
7. Port Nicholson	Pencarrow Head	Cook Strait, N. Zealand	R.	420	30	Est. 1st Jan '59. Eclipsed every two minutes. Periods of duration not stated. 41° 22′ S., 174° 51¼′ E.
8. Cape Northumberland *(b.)*	38° 3′ S., 140° 37·8′ E.	South Coast Australia	R.	123	18	Est. 1st Jan., '59. Showing a white, red, and green light in succession once in every minute. Visible seaward from E.S.E.¼S. to W.S.W.½W. The red light invisible beyond 15 and the green light beyond 8 miles.
9. Sheerness	Garrison Pt.	Kent	F.	32	5	Est. 1st March, '59. Red.
Whitby	Pier Head	.....	..	..	..	Est. 5th Feb., '59. As green lights.

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

(a.)—This will supersede the notice hastily given in our last.

(b.)—*Directions.*—Vessels from eastward should not bring the white or red lights to the westward of W.N.W.; when the green light comes in sight on that bearing should steer more southerly, to give the reef eastward from the cape a wide berth.

Vessels from northward should never sight the white or red light bearing to the southward of E.½S., and on distinguishing the green light should immediately alter course so as to give a berth to the reefs westward of the cape reaching along the coast at a mile from it.

In bad weather with the wind southerly keep an offing from the cape so as not to sight the green light. In thick weather, or when blowing hard, the red light should not be sighted, as it would not then be seen at the above distance.

The coast north-westward of the cape should be avoided, in consequence of the heavy ocean swell which sets directly on shore.

The light-keepers are provided with a 9-pounder carronade and a code of Marryatt's signals, which will be used to warn vessels observed to be standing into danger.

The bearings are magnetic. Variation 4° E. in 1858.

LIST OF CHARTS *Published and Corrected by the Hydrographic Office, Admiralty, in February*, 1859.

England, South coast, Needles Channel, corrected to February, 1859, (1s. 6d.)

England, West coast, Liverpool Bay, corrected by Lieut. M. Parks, R.N., 1859, (2s. 6d.)

France, Mediterranean, sheet 1, Palamos to Cape Béarn, (1s. 6d.)

France, Mediterranean, sheet 2, Cape Béarn to Cape D'Agde, (1s. 6d.)

France, Mediterranean, sheet 3, Cape D'Agde to Les Saintes Maries, (1s. 6d.)

France, Mediterranean, sheet 4, Les Saintes Maries to Marseille, (1s. 6d.)

France, Mediterranean, sheet 5, Marseille to Hyéres, (1s. 6d.)

France, Mediterranean, sheet 6, Hyéres to Rade D'Agay, (1s. 6d.)

France, Mediterranean, sheet 7, Rade D'Agay to St. Remo, (1s. 6d.)

South Pacific Ocean, Woodlark Island, South coast, Mr. Arguimbau, Master, R.N., 1858, (1s.)

Australia, Port Jackson and views, Capt. Denham, R.N., F.R.S., 1857, (3s.)

West India Pilot, vol. 2, Capt. E. Barnett, R.N., (5s.)

African Lights corrected to February, 1859, Commander Dunsterville, R.N., (3d.)

Deep Sea Soundings in the North Atlantic Ocean between Newfoundland, the Azores, and England, by Commander Dayman, R.N., in September and October, 1858, (1s)

North Sea Pilot, Appendix No. 1.

Admiralty, 21st February, 1859.

THE GREAT EASTERN.

The *Civil Engineer's Journal* says of the *Great Eastern* that—

The preparations necessary for fitting this noble vessel for sea have at last been decided on, and will be immediately carried out. To one contractor will be entrusted the iron work still requisite in the hull and in the construction of the poop and masts, while separate contracts will provide for the rigging and sails and the cabin fittings and joiners' work. No money will be wasted in the mere frippery of decoration, though at the same time all the fittings will be of the best and most substantial kind. The design for the poop is complete in all its details. All of it will be constructed of iron, and some idea of its size may be gathered from the fact that the chief dining saloon, 120 feet long by 47 feet wide and 9 feet high under the beams, will

be in that part of the vessel. There is to be a large number of bath-rooms allotted to each class of passengers, all of which will be kept supplied with hot and cold fresh and sea water. The contractors are to commence their work on the 15th instant, and are bound under penalties to complete all in five months from that date. The long-expected first trial trip will therefore take place about the middle of July, when it is intended to run out from Weymouth to the middle of the Atlantic and try the ship under all possible conditions of sail and steam. This short voyage will probably occupy about six days, for the lowest estimate yet made of her speed allows her 17 knots, or about 18½ statute miles an hour, the speed of a parliamentary train. The commencement of the work of fitting will be made by which the large iron floating Derrick launched last autumn will be used for the purpose of hoisting in the main shaft of the paddle engines and the rudder. The former weighs 40 tons, the latter 13, and each of these ponderous masses of iron work have been finished off with as much care and even neatness as if they were intended for the works of a clock. Both these will be deposited in the fore part of the vessel in order to assist in bringing her more down by the head when the blades of the screw are being fixed. The latter have not been attached to the screw bars, as in case of ice during the winter enough might have formed round them to have held such a mass of the loose pack as with the flow of the tide might have seriously endangered the ship. Trotman's anchors, by which she is now moored, would never have given way; but the chains unquestionably might.

EXPERIMENTS WITH NEW RIFLE MISSILES.—The experiments for the purpose of publicly testing the inventions made by Captain J. Norton, an old Peninsular officer, recently took place on the practising ground of the Royal Engineers, at Brompton, and, notwithstanding that the rain fell in torrents during the whole time, a number of officers of the Royal Engineers were present. The first portion of the afternoon was devoted to testing a new description of shell, called by Captain Norton a "liquid fire-shell." The merit claimed for this invention is that the phosphorus and other chemical properties contained in the shell are of so highly inflammable a character that immediately on its striking either the sails or rigging of a ship, they become ignited, and are thus destroyed. A number of sacks were suspended on the ground to represent the sails of a ship, and these were soon wetted through by the rain. Captain Norton having loaded a large rifle with his shell, which is somewhat larger than a rifle bullet, fired at the sacking, and, although the materials were so wet, the whole mass was shortly in flames; for immediately the shell struck the sacking, the bottle in which the chemical mixture was contained burst and covered the whole of the substance. Had the sacking been dry, it would have ignited the instant it was struck by the

shell. Captain Norton then proceeded to experiment with his newly-invented rifle fire-shot, which he has named the "spinster" shot. This messenger is intended, when it is fired from a rifle, to set fire to the powder in ammunition waggons, bags of gunpowder, and also firing dry grass in jungles. This shot has been fired by Captain Norton at a distance of 1,800 yards. In the experiments a bag containing about 2lbs. weight of gunpowder, mixed with a great quantity of sawdust to increase the bulk, was placed on the ground, and was saturated with the rain. On the ball being fired into the powder no effect was immediately perceptible; but after a short time the gunpowder was ignited and blew up with a loud report. Both these experiments were considered perfectly satisfactory by the officers who witnessed them.

A LION IN COMMAND.—The somewhat unusual spectacle of a "lion hunt" took place on board the *Himalaya* on the 2nd February. One of the Moors was engaged in feeding the lion through a door which opened for that purpose in a part of his cage or den, when, with a sudden spring, the animal dashed through the opening on to the steamer's main-deck, which, as may be imagined, was soon cleared. The hatchways were at once closed, and measures promptly taken by Commander Seccombe to secure the animal as speedily as possible. For this purpose the commander, with the senior lieutenant, boatswain, serjeant of marines, and two men, descended to the main-deck, taking with them the end of a stout line; this was rove through a ringbolt in the deck, and a running noose formed with the end. After some considerable manœuvring, the noose was thrown over the lion's head, the word given to the hands on deck, who ran away with the other end of the line, and the lion was pinned down to the ring-bolt in the deck. His legs were immediately secured, and he was dragged back to his den in safety.

NEW ZEALAND MAIL-SERVICE.—The screw steamers *Lord Ashley* and *Lord Worsley*, belonging to the Intercolonial Royal Mail Steam Packet Company, having arrived in New Zealand in the early part of October, the mail service between Sydney and the various ports in New Zealand was commenced on the 1st November, when the *Lord Ashley* left Auckland for Sydney, carrying the mails, fifty-six passengers, and some cargo, since which date the vessels have been punctually performing the service. The period allowed under the terms of the contract for the passage from Sydney to Nelson is seven days; but the *Lord Ashley* made the return trip to Nelson in five days, and the *Lord Worsley* completed the voyage thence to Nelson in six days. The New Zealand people are much pleased with the vessels,

and pronounced them handsome and faultless models. They admire the steamers' excellent passenger accommodation, and consider them admirably adapted for the service. It is expected that the *Prince Alfred*, screw-steamer, 1,200 tons, would arrive at Melbourne from England some time in December. The *Airedale*, screw-steamer, 500 tons, has just been despatched. She is bound for Canterbury direct, and carries a large quantity of stores, a full cargo, and some passengers. The subsidy of £24,000 per annum commenced on the 1st November. There is a large intercolonial and interprovincial passenger traffic, and the prospects of the company are very encouraging.

AUSTRALIA.—*Extraordinary Passages of the White Star Clippers.*—We have been much gratified to hear of the safe arrival out of the Liverpool September fleet, and note with satisfaction the fine passage of our old favourite the *Mermaid*, in 80 days, beating every ship that sailed during the same month. The regularity of the passages made by the clippers of this celebrated line, is somewhat marvellous, as indicated herewith:—*Invincible*, June packet, in 76 days; *General Wyndham*, July packet, in 79 days; *White Star*, August packet, in 72 days; *Mermaid*, September packet, in 80 days. These passages, although not equal to the famous runs of the *Red Jacket*, *White Star*, &c., indicate a regularity of speed never exhibited by any line afloat. The same firm despatch on the 20th of March the majestic clipper ship *Tudor*, one of the very largest packet ships in the world. She has a magnificent flush deck, of nearly 300 feet in length, and has enormous capacity below. She will be despatched under the able command of Capt. Wherland, whose great experience and kindness during his command of the *Columbine*, won him golden opinions; she is expected by her owners, from her fine lines, and extraordinary spread of canvas, to eclipse some of the greatest passages ever made.

THE LOSS OF THE "WIZARD."—The following are the particulars of the loss of H.M. brig *Wizard*. On the night of the 8th of February, a little before twelve o'clock, the vessel, in attempting to enter Bantry Bay, went on shore on the small Rhone Corrid, or Seal-rock, outside the East entrance. The night was exceedingly dark and hazy, and the weather very stormy. After she struck her guns were fired, when the coastguard and some of the inhabitants of the neighbouring shore went to her assistance in two boats, and after considerable difficulty succeeded in taking off the crew. The firing from the *Wizard* was also heard on board H.M. gunboat *Skipjack*, which was anchored in Berehaven Harbour, about four miles from the scene of the catastrophe. Steam was got up on board her, and she proceeded to the spot and took the officers and crew of the *Wizard* on board. The latter became a total wreck, and the officers did no even save their clothes.

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

APRIL, 1859.

The Westerly Route for Crossing the Line.

As the westerly route for crossing the line is becoming every day more common with our outward-bound ships, perhaps the result of the experience of our last five voyages may be useful. I shall give the particulars of the present voyage only, and make a few remarks on the four previous. Of course it is to *Maury's Sailing Directions* and *Wind Charts* that I am indebted for my first information respecting it; and from a careful perusal of his book and charts I think that he advises the course which we have followed.

On the 2nd Oct., 1858, we were in lat. 17° 43′ N., long. 26° 29′ W. From this position, being West of the Cape Verd Islands, I endeavoured to make a true South course when the wind was fair, and preferred the tack which gave the most southing when it was foul.

From the 2nd to the 7th we went on well, for on the latter date we were in lat. 7° 29′ N., long. 27° 52′ W., having been driven by the wind and about thirty-eight miles of current eighty-three miles further West. From the 7th to the 15th we had the Doldrums. Until the 10th, when we were in lat. 6° 25′ N., long. 26° 57′ W., the weather was chiefly fine, with a mixture of northerly and southerly swells; after that, heavy rain squalls, looking very threatening, but not sufficient wind to require the royals to be taken in, with a high southerly swell. During the whole time the wind was from East round by South to West, but chiefly South; the current was generally to the eastward from 11° to 5° N.

Oct. 15th.—Lat. 4° 8′ N., long. 25° 41′ W; current in the last

twenty-four hours, West, sixteen miles; wind S.b.W., by compass; variation, 17° W. This was the point where I had to decide whether to steer to the eastward, making a little northing, until I considered my ship far enough to windward, or to the westward, making about W.S.W., with the certainty of a westerly current. I chose to go to the westward, feeling sure that the wind would gradually draw to the S.E., whereas I think that had we gone to the eastward we should have continued in the variables, if we did not run back into calms.

Before proceeding with our route I will here remark that my * East and West of ☾ lunars placed us thirty-four miles West and my ☉ West of ☾ lunars 27½ miles West of our best chronometer, so that I had good reason to distrust it;* afterwards, on passing close to the Rocas, which by Raper are in 33° 44′ W., I was led by cross-bearings to suppose that we were 23° W. of it. For the benefit of lunar observers I would call attention to the great difference that may exist between lunars taken on different sides of the moon; so that a single lunar taken only on one side may be worse than useless, at the same time that if another were taken on the other side of the moon, their mean would give a result nearly correct. I had * lunars East and West of the moon on four consecutive evenings, when the following errors were obtained— :

Dent, No. 1759, *Chronometer.*

	Slow.	*Fast.*
	m. s.	m. s.
Oct. 14th, Antares 41° W. of ☾	0 50·4	
„ 14th, Fomalhaut 45° E. of ☾		4 15·4
„ 15th, Antares 53° W. of ☾	0 46·8	
„ 15th, α Pegasi 54° E. of ☾		4 1·2
„ 16th, Mars 33° W. of ☾	0 44·3	
„ 17th, α Arietis 70° E. of ☾		4 53·1
6)91	2 21·5 slow.	13 9·7 fast.
		2 21·5 slow.
Oct. 15th.		6)10 48·2
Error on Gr. mean time by the mean of *'s E. and W. of ☾		1 48·0 fast.

Here it will be seen that the mean of the * West ☾ lunars made the chronometer 0m. 47s. *slow*, whilst the mean of * East ☾ lunars at the same time made the same chronometer 4m. 23·2s. *fast*. The difference of these, or 3m. 36s. *fast*, divided by 2, gives 1m. 48s. *fast*, which was very nearly a correct error on the 15th of October. But how far any single lunar was from showing this! though the relative difference—equal to seventy-five miles of longitude—between the East and West lunars was very nearly the same throughout;

* It may be well to note here that we had much bad weather in the Bay of Biscay on the 17th September, when we lost our main and mizen topmasts and that the second differences of the chronometers proved that they had been affected by it.

showing that the cause of it, whether in the instrument or observer, was also constant throughout. My ⊙ West ☾ lunars generally make the chronometer slower than the ⊙ East ☾, but not to this extreme amount. I give this as a double caution to lunar observers: first, to prevent their placing too much dependance on one lunar; and secondly, to prevent their giving up lunars in disgust because one observation is egregiously incorrect. They should go on taking them, and if they find a constant relative difference between their East and West lunars let them be assured that the mean of them is very near the truth.

If I understand the *Mercantile Navy List* rightly, none but the first class extra men are now required to know how to take and work a lunar. Now, small ships going to the East Indies sometimes have only one chronometer, and many large ones have only two: then what check have they on their chronometers? All the captains of small ships that I sailed with in my early days took lunars, but now young men give them up as something quite unnecessary, because they form no part of their examination. When I was examined at the Trinity-House in 1850 I was required to pass in lunars and six books of Euclid to get a first class certificate: it seems that a change has been made in the wrong direction.

Having diverged from the object of this paper to give this advice, I will also here say a word respecting the Prince Shoal, mentioned in the *Nautical Magazine* for September, 1854, page 509. Though I do not wish to prevent any one from keeping a good look-out for it, still Captain Thomas's account of his brig feeling as if she were dragging lightly over sand or coral resembles completely that of a captain who was passing near this part when he experienced what he supposed to be an earthquake, and described to me that the ship felt just as if she were dragging over a sand-bank, though they had no soundings. Certainly the brig's copper being grazed on the lee bilge differs from the other captain's account, whose vessel had not suffered. Raper gives from 7° N. to 1° S. lat. and from 16° W. to 24° W. long. as the region of submarine volcanoes, which very nearly includes this position, so that a dangerous shoal, or even island, might be thrown up at any time; and, as the westerly route is becoming more and more common, it makes it necessary to bring any supposed danger in those parts prominently to the notice of sailors. I will therefore repeat the position which Captain Thomas gives for the growing coral reef, and promise to keep a good look-out for it when passing near lat. 0° 54′ N., long. 26° 50′ W.

To return to our voyage;—it will be remembered that on October 15th we had the wind S.b.W. and stood on to the westward.

Oct. 16th.—Lat. 3° 15′ N., long. 27° 22½′ W.; course and distance, S. 62½° W. 114 miles; current in the last twenty-four hours, N. 39° E. 12 miles; variation, by azimuth compass, 17° 3′ W., by steering compass, 16° 3′ W. At 10h. a.m. a large ship passed us steering to the eastward and we lost sight of a barque which was in company, so I suppose that she also went off to the eastward. The wind drew

to the South by compass, so that we were able to make true S.W.$\frac{1}{2}$W. The weather during the last twenty-four hours looked unsettled, especially in the N.W., where there was lightning; but even when we broke off to W.b.N. for an hour I felt that by going on the port tack we were drawing into the S.E. trade.

Oct. 17th.—Lat. 1° 30′ N., long. 29° 24′ W.; by * lunars, 30° W.; course and distance, S. 48$\frac{1}{2}$° W. 162$\frac{1}{2}$ miles; current, S. 77$\frac{1}{2}$° W. 13 miles. The wind from S.b.E. to S.S.E.; the sea smooth and weather very delightful.

Oct. 18th.—Lat. 0° 52′ S., long. 31° 24′ W.,—by * lunars 32° W.; course and distance, S. 41° W. 184 miles; current, S. 44° W. 12 miles. The wind from S.S.E. to S.E.b.S. Variation, by azimuth compass, 12° 56′ W., by steering compass, 11° 26′ W. In working the dead reckoning I allowed 3° leeway, as we were very sharp up: this I have done throughout. Perhaps the sudden decrease in the variation is not always taken into account here; if not, the difference goes to increase the westerly current. At 9h. p.m., by meridian altitude of Fomalhaut, we were in lat. 1° 52$\frac{1}{2}$′ S. This evening we caught a noddy with a cap of white feathers on his head.

Oct. 19th.—5h. a.m., lat. per meridian altitude of Sirius, 2° 32′ S.; noon, lat. 3° 15′ S., long. 31° 56′ W.,—by * lunars, 33° 30′ W.; course and distance, S. 33° W. 171 miles; current, S. 13° W. 8 miles; variation, by azimuth compass, 11° 50′ W., by steering compass, 10° 5′ W.; wind, S.S.E.$\frac{1}{2}$E.; bearing and distance of the Rocas, supposing them to be in lat. 3° 55′ S., long. 33° 44′ W., and taking the mean of the above longitudes as my position at noon, S. 38° W. 51 miles. 3h. p.m.—Lat., per meridian altitude of Venus, 3° 33$\frac{1}{2}$′ S. 3h. 20m., p.m.—Long., per altitudes of the sun, using the London rates for the best chronometer, 33° 10$\frac{1}{2}$′ W. Hence, since noon we had made S. 36° W. 25 miles.

It may be well to remark here that Venus has often been very useful to me, even at the entrance of the English Channel, for when she passes the meridian between two and three hours before or after the sun, she gives the latitude just at the time when sights of the sun give the longitude. By calculating her altitude with the dead reckoning latitude and looking in the North or South part of the horizon, according to whether she is to the North or South, it is not difficult to find her even when the weather is not very clear. If a plain telescope be used, and the green screen before the horizon glass, they help to find her when she cannot be seen by the naked eye, and she gives quite as correct a latitude as the sun. It must be remembered that the *mean* time of Venus passing the meridian is given in the *Nautical Almanac*, which must have the equation applied, as directed in page 2 of each month, to find the apparent or usual ship time.

Throughout the afternoon we steered about S. 35° W., and at 5h. p.m. we saw the reef about twelve miles off, extending from nearly right ahead out on the weather bow; and at 6h. we kept away W.S.W., so as to pass it at the distance of about five miles.

The sighting the Rocas was one of very many instances in my ex-

perience proving the look-out man, either from want of practice or from want of feeling an interest in what he was doing, unable to see an object almost staring him in the face. From 3h. 30m., p.m., I ordered a regular look-out from fore-topsail-yard, and at 5h. p.m. felt so sure that the reef must be in sight that I determined to visit the topsail-yard myself; when on stepping into the rigging something strange caught my eye, which proved to be a beacon on the western part of the reef: yet from the topsail-yard the look-out man had seen nothing, and could hardly see it when I pointed it out. A similar case happened one evening on our way towards Torres Straits, when I sent an officer up to look round as the sun set, though I always kept a man on the fore-topsail-yard. He quickly saw a long line of broken water right ahead, it being part of Lihou Shoal extending further to the eastward than it was laid down either in charts or books. I find that in moderately clear weather, when observations show that the land may be sighted, a good night-glass on the forecastle and a patent lead are first-rate safeguards; indeed the three L's are all right enough, but much depends on the quality of these said L's.

From the fore-topsail-yard, with a first-rate Dollond, I examined the reef carefully. It reminded me of Wreck Reef and others in Torres Straits in the usual characteristics of a fringe of rocks sticking above water all round it, and lagoons of beautifully green water inside the fringe. There were loose pieces of rock lying in different parts, apparently thrown up by the sea, one larger than the rest on the eastern end of the reef; and on the western was the highest patch of sand: it was very white, though partly covered by something looking like brownish grass, and there was placed the beacon. It seemed to have been made by some shipwrecked crew,—most likely by that of the brig *E. D.*, lost there in October, 1856,*—for I made myself quite sure that no living human being was on it as we passed. Neither did I see any signs of the cocoa-nut trees planted by Commander Parish, of H.M.S. *Sharpshooter*.

From this bird's-eye view I think that the whole reef was fringed with rocks above water, with no passage even for a boat between the patches of sand. There were large numbers of birds settling on the island, and as the evening advanced we passed several which were steering a straight course for it. This, as has frequently been remarked before, is a capital sign for pointing out land, for the booby and some other sea birds will, if possible, find a resting-place for the night, even though it should only be a ship's yard-arm; when some mischievous boy is sure to disturb his dreams, of which he makes every body in the ship aware by his loud screaming as he is carelessly carried down the rigging by the neck.

7h. p.m.—As we passed the reef, the white sand island on the western end bearing E.b.S., at a distance of about five miles, we hove

* For the particulars of this wreck see *Nautical Magazine* for February, 1857.

the lead and had no ground with 43 fathoms up and down. A plan of the reef would be very useful if published in the *Nautical Magazine*. For myself, I constructed one from the *Sharpshooter's* bearings, not having seen the one by Commander Parish, nor the one by Lieutenant S. P. Lee, of the U.S. brig *Dolphin*, who, by the bye, agrees with Commander Parish in placing the Rocas in lat. 3° 51′ S., and gives the long. as 33° 49′ W.

9h. 10m. p.m.—Lat. per mer. alt. of Fomalhaut, 4° 7′ S. 10h. 14m. p.m.—Long. per alts. of Altair, 33° 47′ W. Here it may be as well to note that after passing the Rocas I added 23′ W. to the longitude by my best chronometer, using the London rate until a few more lunars should give me sea rates.* There being a good moon and clear horizon, I found our position very frequently, in order to detect the first signs of the strong westerly current which some ships have experienced in this part of the sea.

Oct. 20th.—2h. 48m. a.m.—Lat., per mer. alt. of Aldebaran, 4° 41′ S. 3h. 6m., a.m.—Long., per alts. of Pollux, East of meridian, 34° 15¾′ W. 3h. 26m., a.m.—Lat. per mer. alt. of Capella, 4° 44′ S. 3h. 34m., a.m.—Long., per alts. of *α* Arietis, West of meridian, 34° 14¾′ W. The plan of taking two meridian altitudes and altitudes of stars on both sides of the meridian for longitude seems to check any little mistake that may be made in night altitudes; and they do check most effectually any errors of calculation, for if they do not nearly agree they ought to do so; and if calculated on opposite pages in the same opening of a book they take very little more time. These observations gave us to have made S. 32° W. 105 miles since noon of the 19th, and Cape St. Roque bearing S. 48° W. 67 miles, so that the westerly current had not yet caught us.

Noon.—Lat. 5° 37′ S., long. 34° 38′ W.; course and distance, S. 29½° W. 162½ miles; current, N. 57° W. 7½ miles; variation, by the azimuth compass, 10° 54′ W., by the steering compass, 9° 9′ W. The wind the last twenty-four hours from S.E.b.S. to S.E., generally drawing more to the southward in the afternoons. A Spanish brig was close to us, and, having missed all the homeward-bounders North of the line, we sent a boat with our letter-bag for England and a few copies of the last illustrated papers. She proved to be the *Francisco*, twenty-six days from Monte Video bound to Havannah. Her longitude was 6′ East of ours, and she reported much North-westerly wind.

Well pleased to have sent off a bag full of letters, we proceeded, gradually breaking off, so that at 6h. p.m. we were about fourteen miles from Ponte Negra, and tacked to the eastward. The land and sunset over it were a treat to the eye, but none to the heart. 6h.

* Oct. 22nd.—Since writing the above we have obtained errors for the chronometers by the mean of ☉ East and West of ☾ lunars, and rates by those East of ☾, which placed the Rocas in 33° 44′ W., while the star lunars placed them eighteen miles further West. Now 35° 53′ W., the mean of the ☉ and ✱ lunars, puts the Rocas further West than Raper does, and supports the position given to them by Lieutenant S. P. Lee, U.S.N.

58m., p.m.—Lat. per mer. alt. of *a* Cygni, 5° 59′ S. At midnight we tacked again to the S.S.W., the wind being S.E.

Oct. 21st.—2h. 45m., a.m.—Lat. per mer. alt. of Aldebaran, 5° 57½′ S. 3h., a.m.—Long. per alts. of *a* Arietis, West of meridian, 34° 32′ W. 3h. 3m., a.m.—Long. per alts. of Pollux, East of meridian, 34° 34′ W. 3h. 23m., a.m.—Lat. per mer. alt. of Capella, 6° 1′ S. Hence Cape Ledo bore S. 20° W. 57½ miles; Point Guia, S. 9° W. 88 miles. Stood on, hoping for a slant, the wind being S.E. by compass. At daylight the land was in sight, but we stood on until 10h. a.m., when we were abreast of St. Miguel; at any rate we saw a village of huts on a piece of cleared ground about due West of us. There was a steamer close inshore proceeding to the southward, and several boats, apparently fishing; one with no sail set was about twelve miles from the land. Noticed that the water had changed colour and began to smell. Sounded, and found 10 fathoms, pink coral; which agrees with Horsburgh, who says that there are 10 fathoms at a distance of about ten miles. We tried the specific gravity and found it the same as before, 1027·2; and the temperature of the surface water, 79·9°. 10h., a.m.—Tacked, and lay E.N.E. on the starboard tack.

Oct. 21st.—Lat. 6° 36′ S., long. 34° 41′ W.; course and distance, S. 3° W. 59 miles; current, S. 64° W. 18 miles; variation, per azimuth compass, 10° 32′ W., per steering compass, 8° 47′ W. All the azimuths given here were taken about 8h. 30m., a.m., with a very good compass supplied by the Board of Trade. 8h., p.m.—Tacked and lay up S.W., with an inclination in the wind to draw to the eastward. 8h. 13m., p.m.—Lat. per mer. alt. of *a* Gruis, 6° 15′ S. 8h. 34m., p.m.—Long. per alts. of Vega, West of meridian, 34° 4¼′ W. 9h. 4m., p.m.—Lat. per mer. alt. of Fomalhaut, 6° 18′ S. 9h. 14m., p.m.—Long. per alts. of Achernar, East of meridian, 34° 3¼′ W. These gave us to have made N. 63° E. 42 miles since noon. Cape Ledo bearing S. 54° W. 61 miles, and Point de Guia, the eastern extremity of America, S. 32° W. 81 miles. Hence, leaving orders to call me if she broke off to S.W.b.S., and at 2h. 30m., a.m., of the 22nd, for more observations, I felt safe in turning in for a few hours.

Oct. 22nd.—2h. 41m., a.m.—Lat. per mer. alt. of Aldebaran, 6° 44½′ S. 2h. 56m., a.m.—Long. per alts. of *a* Arietis, West of meridian, 34° 10¾′ W. 3h., a.m.—Long. per alts. of Pollux, East of meridian, 34° 13′ W. 3h. 19m., a.m.—Lat. per mer. alt. of Capella, 6° 48′ S. These observations gave us to have made S. 15° W. 30 miles since 9h., p.m., agreeing with the dead reckoning; Point de Guia now bearing S. 41° W. 53 miles.

Noon.—Lat. 7° 28′ S., long. 34° 11′ W.; course and distance, S. 30° E. 60 miles; current, N. 16° W. 7½ miles; variation, per azimuth compass, 11° 35′ W., by steering compass, 9° 35′ W. Thus all our troubles with respect to the land were now at an end. The next day we made S. 13° E. 141 miles; and on the 24th S. 6° E. 161 miles.

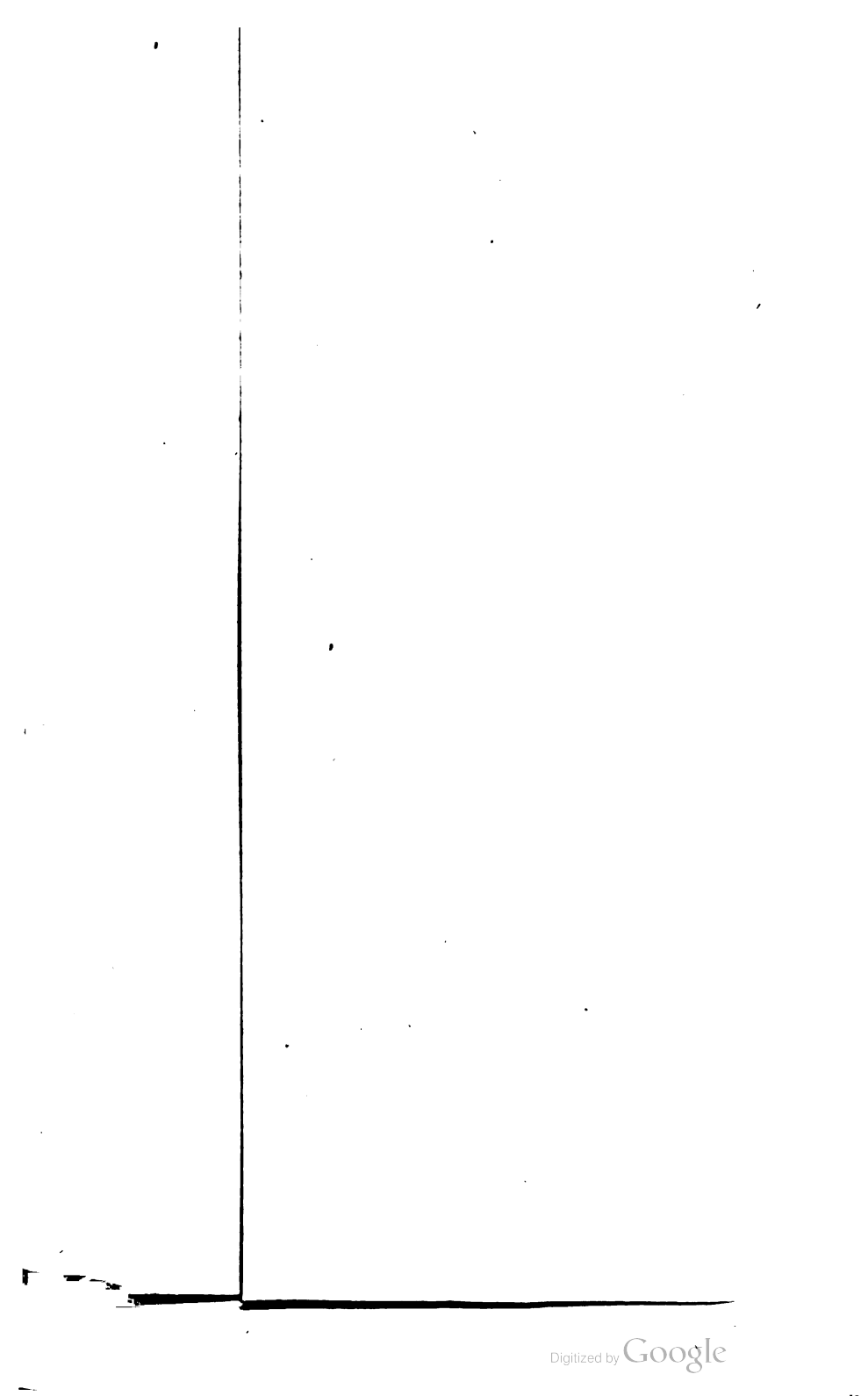
Now it remains to be decided how we should have fared if on the

15th we had stood to the eastward, making easting, with a little northing, until we thought ourselves far enough to windward. In our present case we certainly had to tack off America (though it is the first time in my extreme westerly routes that I have had to do so), yet in two days we beat 111 miles to the South and 27 to the East, and cleared the difficulty. It would not be right, however, to tempt ships near reefs and land unless they gain by it; and merely by a comparison of my own voyages of other years at the same season I should condemn this route, for I never did worse from 10° N. to the equator than this year. Once at the very same date I passed between the Cape de Verdes and Africa. Then we were 13 days from 10° N. to the line, but were not troubled near South America and had a better S.E. trade. This time we were only 12 days, but lost a day near South America. In October, 1852, I passed 10° N. about 2° further East within a day or two of our date, and was only 8½ days to the equator, which we crossed in 20° W., having been carried into 18° W. by a strong S.W. monsoon, which turned into the S.E. trade without a calm. Still, this probably was an exception, and I should like and shall try to see the logs of some ships which passed through the Doldrums with us.

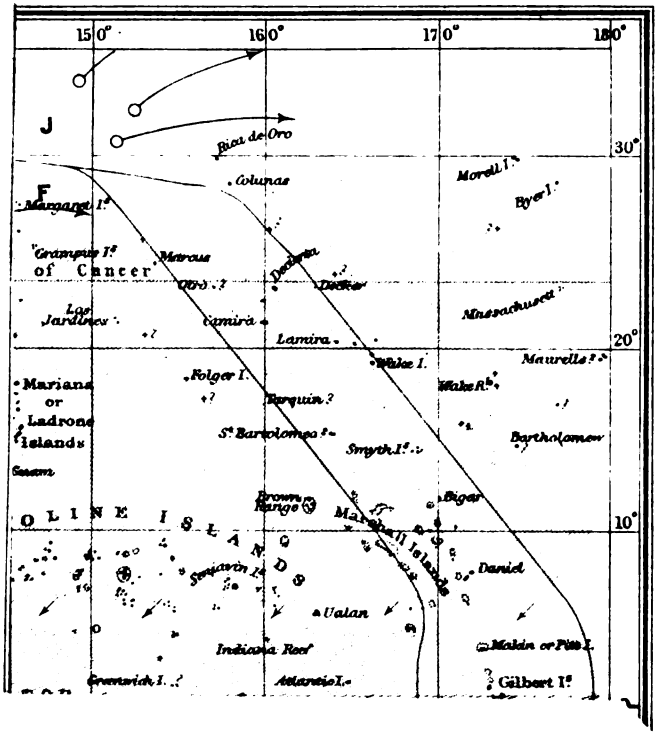
September 25th, 1856, and October 15th, 1857, I crossed the equator much in the same longitude as this year,—that is 31° W.; in September passed twenty-five miles to the westward of Fernando Noronha, and in October still nearer, and both voyages we weathered America with ease. Once in May I crossed the equator between 28° and 29° W. and could not weather America, but was much bothered off Cape St. Augustine.

Again, from Cape St. Augustine to the Abrolhos, the ships which pass far West do not seem to do so well as those which go far to the eastward. For instance, as I am now writing on the 26th October, we have done but S. 14° W. 51½ miles, and on the 25th S. 23° W. 85 miles. For all this one feels inclined to blame the westerly route; at any rate until it is proved that the ships which went to the eastward have done as badly or worse than ourselves.

The conclusion I am inclined to draw from all this is, that in October when once your ship is so near the equator as to expect the S.E. trade, and the wind sets in from S.b.W. by compass, go on the port tack with the yards sharp up, and keep well full; then the wind is almost certain to turn into the S.E. Trade, with beautiful weather. My experience would lead me to say that in October, when you are below 5° N., with a steady S.b.W. by compass wind, you have the commencement of the S.E. trade, and should stand boldly on on the port tack; but I am not quite decided as to how a ship ought to steer after passing to the westward of the Cape de Verd, though I think as we have done this year; that is, due South with a fair wind, and the tack on which you make the most southing with a foul; because the probability is, that you will have a S.W. monsoon, which will drive you well to the eastward. If there were not this probability I would have a ship in October steer to get the S.E. trade, or rather the S.b.W.



THE
MAY TO SEPTEMBER, INCLUSIVE.



wind, in about 20° W., for if she does not get into the latitude of Cape St. Roque quite so soon, I think she will be in a better position by the time she loses the S.E. trade.

December 31st, 1858.—Last evening we arrived in Madras, and by the flash of the gun I find that on applying the errors and rates to the chronometers supplied by the maker before leaving England, the best chronometer was 56½ miles too far East, and the worst one 175 miles, while the lunar errors were right to one mile, and the lunar rates to four-tenths of a second. I may add that the *Nautical Almanac* gives the longitude of the Madras Observatory as 5h. 21m. 4s., but my friend Mr. W. H. Bayley tells me that some years ago Mr. Taylor, the Astronomer here, detected a mistake in this, and that it really is, 5h. 20m. 57·3s. Major Worster, now in charge of the Observatory, also says that this is the correct longitude.

[We thank Captain Toynbee for contributing this practically useful paper to the pages of the *Nautical*,—one not only acceptable to those readers for whom it is intended, but creditable to the commander of a British merchant ship. In respect of the western passage on which it treats, one observation should not be forgotten. To the *American* ships the western passage is of more importance than to ours. Hence Maury's researches. For our part we confess to a dislike of going West of the meridian of 30° W., and have not forgotten Captain Pullen's observation on Maury's directions on this subject in page 338 of our last volume.—ED.]

NOTES ON THE ROUTES FROM SINGAPORE TO NEW CALEDONIA AND THE N.E. COAST OF AUSTRALIA,—*from May to September, inclusive.*

Southern Route.—During this season the quickest passages have been made to the Australian colonies by the southern route; for although some delay is experienced in getting to the strait of Sunda against the S.E. winds, there is no difficulty in passing through the strait into the Indian Ocean, where the trade wind is usually strong and steady as far as 28° S.; after which the westerly winds which blow with great strength to the South of that parallel soon carry a ship to her destined port. And as these winds curve round Cape Howe, and blow from the southward and S.W. along the East coast of Australia as far as the tropic, no difficulty will be experienced in reaching Port Curtis and New Caledonia at this season.

The only disadvantages connected with the route are the foul winds that will be experienced at first starting, and the inclemency of the winter season in high southern latitudes; where the cross seas which get up when the wind chops suddenly from N.W. to S.W., which often

happens, are of a peculiarly dangerous character. This route, however, is so well known, at least as far as Bass Strait, that it is only noticed here for purposes of comparison.

Northern Route.—The passage from Singapore to the Australasian colonies by way of the North Pacific has never yet been tried, nor would it be advisable for any vessel bound to a settlement South of Moreton Bay to make the attempt, as great difficulty would be experienced in getting to the southward against the southerly and S.W. winds which prevail between the East coast of Australia and New Zealand, and which have much the character of the monsoon that occurs at the same season in the Mozambique Channel. Ships from China to the southern colonies by the Pacific route are often greatly retarded by these winds towards the conclusion of the voyage, which has made the route very unpopular of late, and it is not much used now except by vessels carrying native passengers, when it is an object to avoid the inclement weather of the winter season to the South of Australia. Ships carrying freight from China and Manila generally stand to the southward when they get the N.E. trade, and enter the Indian Ocean by the Gilolo Passage and Timor Straits, after which the southern route is pursued.

During this season the N.E. and S.E. trade winds of the Pacific blow with steadiness and regularity, and ships pass from one into the other, on crossing the line, without an interval of calms or variable winds. And as the S.W. monsoon blows steadily between this port and the N.E. coast of China, the only point on which details are necessary is with respect to the facilities for running down sufficient easting in the northern variables to enable a ship to lay up across the trades so as to fetch to windward of the destined port.

The wind and current charts of Lieut. Maury, U.S.N., which have proved so useful to navigators, give the prevailing winds in the North Pacific from the coast of China as far as 150° E. The accompanying table which is compiled from sheet No. 3, series C. (1853) of these charts, shows the winds experienced during the months of May, June, July, August, and September, by the ships from whose log-books he compiled his chart (chiefly whalers and vessels running between China and California). They are at least as favourable for making easting as those experienced to the South of Australia during the summer season, and they will appear much more favourable when the observations of the U.S. squadron recently employed in the Japan Sea come to be inserted. The squadron left Shanghai for the Loo Choo and the Bonin Group on the 23rd of May, 1853, and carried the S.W. monsoon throughout the passage. The following extract is from the authorised account of the expedition, compiled under the supervision of Commodore Perry. "As during the return voyage moderate breezes from S.S.W. to S.W. prevailed with warm weather, and as, in fact, the wind ever since the first departure from Napha (Loo Choo) had continued from the southward and westward, it may be inferred that the S.W. monsoon extends as far North as the parallels of latitude in which the course of the ships laid." (p. 245).

The Gulf Stream which is found in these latitudes will also materially aid a ship in making her easting. It is so little known, and of such importance to navigation, that the entire report of Lieut. Bent, the officer employed to observe the phenomena, is given below. This singular current, with the water at a temperature of 86°, affords a clue to the mystery of the Bonin Islands having an exclusively tropical vegetation, which has long been a puzzle to naturalists. It also accounts for the productiveness of the southern islands of the Japan Group in sugar and other produce which is usually confined to intertropical regions. It will be well for a navigator making his easting to keep in this stream, which he may easily do with the aid of a thermometer, as it is supposed to curve to the southward after passing the Bonin Group, and at the same time is likely to have an influence in producing favourable winds.

In the accompanying track chart, the route is laid down between Formosa and the coast of China, but it is doubtful whether it would not be best to enter the Pacific by the Bashee Channel to the South of Formosa, so as to get at once into the stream of current. It is also doubtful how far a ship ought to get to the eastward before entering the limits of the trade winds. Horsburgh, in the short paragraph which treats on the route of "ships from Macao to the N.W. coast of America, or to Australia," recommends getting into longitude 165° to 170° before standing to the southward of the parallel of 30° S., and in the case of heavy sailing ships this would probably be advisable; but fast and weatherly vessels may safely enter the trades 10° to the westward of this point. It seems, too, that while the S.W. monsoon prevails in the China Sea ships will make more easting by keeping between the parallels of 25° and 30°. This was the course adopted by the Spanish galleons, which made annual voyages from Manila to Acapulco, in South America, for upwards of a century, and they had the benefit of a long experience.

Should water and refreshments be required during the passage, they may be obtained at Peel Island, in the Bonin Group, where there is a secure port on the West side of the island, which is much frequented by whale-ships. There is a population numbering about 100, consisting of a few Europeans and Americans, and the remainder Sandwich Islanders, who grow vegetables and rear stock to supply the ships that call for refreshments. Turtle are also abundant. Further on, near the line are the Kingsmill Islands and Pleasant Island (the latter is in lat. 0° 35′ S., long. 167° 10′ E.), both of which abound in refreshments and are much resorted to by whale-ships.

The details given above will enable a reader to compare the routes and draw his own conclusions, as the distances to be traversed on both routes are exactly the same. Commanders of European vessels, when the crews are well provided with warm clothing, will probably still prefer the southern route, where there is more sea room; but commanders of country ships, or vessels carrying native passengers, are likely to incline to the northern route, where no cold weather will be experienced throughout the passage. Perhaps at some future day,

when a trade comes to be established with Port Curtis and New Caledonia, two ships may leave this port on the same day, the one taking the northern and the other the southern route,—and this, after all, will be the only safe test of the comparative merits of the two routes with regard to the time occupied in making the passage.

P.S.—Since the above notes were in the hands of the printer, the writer has examined a number of late Australian papers for reports of the passages of ships from this port during the season that has just closed, but he has only succeeded in meeting with the following, which is taken from the *Melbourne Herald* of October 2nd, 1858. The passage was commenced in the earlier portion of the season, which is considered most favourable; but, being a small vessel, it can only be considered as a criterion for vessels of the same class:—

Hobson Bay.—Arrived.—October 1st, *Caroline*, schooner, 110 tons, Captain L. Wells, from Singapore 18th June. No passengers. The *Caroline* has made a very long voyage from Singapore, caused principally by gales experienced in the S.E. trades and calms in the China Seas. A shortness of provisions had occasioned much discomfort to all on board her.

The Kuro-Siwo or Japan Stream.

The Kuro-Siwo is an immense oceanic current on the East coast of Asia, which will be found on the chart as delineated from the observations made by the expedition, and bears a striking analogy, in every essential point, to the Gulf Stream of the Atlantic.

The results of these observations show quite conclusively that the stream has its origin in the great equatorial current of the Pacific, from which it is separated by the South end of Formosa, about the latitude of 22° N., long. 122° E.; whence it is deflected to the northward along the East coast of Formosa, until reaching the parallel of 30° N., when it bears off to the northward and eastward, washing the whole S.E. coast of Japan as far as the Straits of Saugar.

Near its origin the stream is contracted, and is usually confined between the islands of Formosa and Majico-Sima, with a width of one hundred miles; but to the northward of the latter it rapidly expands on its southern limit and reaches the Lew Chew and Bonin Group, attaining a width to the northward of the latter of five hundred miles.

The north-western edge of the stream is strongly marked by a sudden thermal change in the water of from 10° to 20°; but the southern and eastern limit is less distinctly defined, there being a gradual thermal approximation of the air and water.

Along the borders of the stream, where it chafes against the counter currents and torpid waters of the ocean, as also in its midst, where whirls and eddies are produced by islands and the inequalities in its bed, strong tide rips are encountered, often resembling heavy breakers on reefs or shoals. Its average velocity between the South end of Formosa and the Straits of Saugar was found to be from thirty-five to forty miles per twenty-four hours. Yet upon one occasion, off the

Gulf of Yedo, its maximum strength is recorded as high as eighty miles per day.

To the northward of the parallel of 40° N., in long. 143° E., there is a cold counter current intervening between it and the South coast of Yesso, as shown by a sudden thermal change in the water of from 16° to 20°, which it is believed sets to the westward, through the Straits of Saugar; but the limited stay of the squadron in that vicinity, and the harassing prevalence of fogs, prevented such observations being made as to satisfactorily determine whether or not there was a predominant current flowing in either direction, or whether it was merely the ebb and flow of the tides through the straits. To the westward, however, of a line connecting the North end of Formosa and the south-western extremity of Japan, a cold counter current was again found, which sets to the southward through the Formosa Channel into the China Sea; and it does not, therefore, seem unreasonable to believe that a hyperborean current will be found in the Japan Sea, setting to the sonthward between the Japanese islands and the main coast of Asia, fed by that on the South coast of Yesso, and supplying that one setting through the Formosa Channel.

The Japanese are well aware of the existence of the great stream which washes the south-eastern shore of their empire, and have given it the name of Kuro-Siwo, or Black Stream, from its deep blue colour when compared with the neighbouring waters of the ocean.

It was also noticed by Captains Cook and Kruzenstern and other explorers, but no systematic series of observations, it is believed, has ever before been made upon it.

The average maximum temperature of the Kuro-Siwo is 86°, and the difference between its temperature and that of the ocean, due to the latitude, is about 12°. There is no counter current intervening between the Kuro-Siwo and the coast of Japan to the southward of the Straits of Saugar, and nothing was found to manifest the existence of such a current as *under-running* that stream; and although the observations indicate strata of cool water lying in the longitudinal direction of the Kuro-Siwo, yet their temperature varied but a few degrees from the main body of the stream, and was almost invariably superior to that of the atmosphere above them. The insular position of Japan and the separation of the cold counter current from the Kuro-Siwo allowing the latter to hug close along the south-eastern shores of the islands, have a modifying influence upon the climate of the empire, making it milder and more equable than in corresponding latitudes on the East coast of the United States.

There is a floating seaweed found in the Kuro-Siwo similar in appearance to the *Fucus Natans* of the Gulf Stream.

In the passage of the *Mississippi* from Simoda to the Sandwich Islands the thermometer showed a cold aqueous space between the meridians of 155° E. and 170° W. and the parallels of 30° and 35° N., which bears a general correspondence in the Pacific to the position of the Sargasso Sea in the Atlantic.

The following is the abstract of a table of the winds on the coasts of China and Japan, from 25° to 40° N. lat. and 120° to 150° E. long., during the months of May, June, July, August, and September.

	140°	150°
	K	L
a	22	42
b	11	8
c	2	3
d	35	53

40°

130°	G	H	I	J
a	10	9	251	647
b	4	3	260	420
c	1		24	18
d	15	12	535	1085

35°

120°	A	B	C	D	E	F
a	96	14	176	69	820	224
b	35	1	178	71	474	153
c	2		12	4	89	5
d	133	15	366	144	1383	382

30° 25°

120° 125° 130° 135° 140° 145° 150°

(Compiled from Maury's Charts, Sheet 4, No. 3, Series C.)

Each observation extends over a period of eight hours, and the figures in the columns show the number of periods observed.

a. Periods of eight hours in which a ship could lay a course between E.b.N. and E.b.S.

b. Periods in which a ship could *not* lay a course between E.b.N. and E.b.S.

c. Periods of calms.

d. Total number of observations.

The capital letters will be found in the chart accompanying this number.

[We give this paper as received. In our next we shall give one on the same subject by Captain Hunter, from a former volume of this work.—Ed.]

LIGHTS IN LYRICS

A GLANCE AT THE CHANNEL LIGHTS AS PILOTING MARKS ON A RUN FROM SCILLY TO THE NORE.

THE CHANNEL LIGHTS.

(Concluded from p. 146.)

XLIX.

What naval pageants have been enacted here!
What fleets of ships collected year by year!
Ere England had a navy of her own,
Her cinque ports rallied to protect her home;
Ere science dawned, ere could art supply
Those floating bulwarks that around her lie;
Her daring sons were ever on the wave,
Their skill to try, or some new danger brave!

L.

Such are the scenes Spithead can boast,
Reflecting her country's glory from her coast;
Others there are of more sombre hue,
Which History's page preserves as record true:—
The *Mary Rose* sunk here beneath the wave;
Here, too, brave Kempenfeldt found a seaman's grave;
'Twas here our tars their heavy wrongs expressed;
'Twas here that England saw those wrongs redressed!

LI.

Long passed away are those dark gloomy days,
Darkest of all in England's naval page;
Spithead's fair roadstead 's now more beauteous seen,
Graced by the presence of our virtuous queen!
But these are not our themes, for see the WARNER bright
Reminds us plainly with her *Revolving* light,
Once in a minute, while the NAB likewise,
With two *Fixed* flames safe moored off Bembridge lies.

LII.

From Southsea Castle the Warner 's South half West,
Three miles; the Nab South by East, two and a half at best
From her; while snugly placed between the two,
St. Helens roadstead gives good shelter too:
These will conclude our lights within the Wight,
Next is the OWERS, as a Channel Light;
And once again St. Catherine's we greet,
Since on great sea lights we have to treat.

LIII.

Off Selsea Bill a lonely beacon stands
On rocks that dry, but interspersed with sands;
The Owers to show,—a nest of dangerous shoals,
Replete with banks and well beset with knolls;
'Tis named the MIXON, and in midst of tides,
Five miles and more another light-ship rides
From that lone beacon due South-south-east,
With steady flame in nineteen fathoms at least.

LIV.

Yes, we had forsaken Neptune's wide domain,
To follow through the Solent's yachting plain;
But why? Because some lights are there,
Important to the mariner as elsewhere.
To our own sea tapers let us now return,
See BEACHY HEAD, a steady flame doth burn;
A splendid light, ninety and five yards high,
Above the surface of the sea hard by.

LV.

The lighthouse artist has been busy here,
Approved in design, and with judgment clear;
That such a structure, and on British strand,
Be worthy of the site on which it stand.
Beachy *Revolves* but once in minutes two,
For fifteen seconds shows a brilliant hue
Seaward, and disappears; but in shore
From the eastward it is seen no more,

LVI.

For reasons obvious and with good intent,
As thus will be clearly evident.
For East of the Head, about five miles from shore,
Are certain shoals,—the Sovereign and more;
To guard from which a ship at night,
Must always keep in view the light,
Open of Beachy's land; and never West
Should bring it of North-west by west.

LVII.

Such care will clear the Sovereign Shoals,
The Southern Head and all adjacent knolls.
Well Beachy dost thou perform thy stated task,
In skies serene, or in the stormy blast,
Copying splendour from the circling sun,
Ere day 's departed until day 's begun,—
To vie in lustre with the Queen of Night,
And spoil the effulgence of her borrowed light!

LVIII.

You hardy seamen of our modern day,
Who nightly brave the dangers of your coast,
Have mimic suns to light you on your way,
Those dangers to disarm, those suns to boast!
How fared your brethren of former years?
When in frail barque and without a light
They strove with tides, with seas and fears,
In pitchy darkness of a stormy night.

LIX.

Sea lights have you, and those for harbour too,
Of shorter range, as well as crimson hue;
Four have we passed from Selsea to the Head,
Hampton, Shoreham, and Newhaven *Red;*
While that of Brighton, that it mayn't be seen
So far away as those, is *Green!*
At the chain pier head; but sometimes is not lighted,
And hence by passing ships cannot be sighted.

LX.

Good reasons there may be for this;
But see before us low seated Dungeness,
While in our way we pass in sight
Of Eastbourne, and Hastings with a fishing light;
And Rye, of more importance far,
Shows two lights when ten feet 's on the bar.
And of DUNGENESS the light is *Fixed*,
Steady and clear, with change unmixed.

LXI.

You that from friends have absence long endured,
In sultry clime and distant lands immured;
Have toiled on ocean's wild and rugged waste,
Or loitered in calm and idle languor placed;
Relieved from these when favouring winds combine,
"Cast a fond look where England's glories shine;"
Yours is the lot, the gush of joy to own,
That rises as you near your island home!

LXII.

Well earned that joy! Now Dungeness is passed,
Folkestone and Dover with their lights, the last
Of Channel guides for harbours dry,
When water sufficient they can well supply
For local craft;—while before us stands
The lofty Foreland which the strait commands!
Yes, Dover Strait!—that happy channel,
Which saves us from continental trammel!

LXIII.

Mysterious strait by Providence designed
To make these isles the wonder of mankind!
By seas surrounded, and for freedom ripe,
For ever severed from European gripe!
Where Liberty might raise her fairest shrine,
And useful arts with sciences combine,
Whence true Religion with her flag unfurled,
Might send her blessings forth throughout the world!

LXIV.

Like graves of two huge giants side by side,
The VARNE and RIDGE the entrance of the strait divide
Into two channels; the first bears Dover's name,
The second that of Calais, both well known to fame:
If such they be, buried with them be the feud
Of two great nations:—France and England, wooed
By religion's charms;—knowledge and Christian love,
Hold out to the world the olive of the dove!

LXV.

The Dover channel our seamen mostly take,
And to the wicked Varne are *feelingly* awake
With hand-lead going. Its north end reaches forth,
With Folkestone church North-west by north,
Three leagues away, near two chalk pits seen,
Which church must appear midway between;
Five miles its length South-west along the tide,
And buoy with beacon marks its western side.

LXVI.

That submarine companion of the Varne,
That Ridge gives to our mariners but small alarm,
Although eight miles long and on it little water,
Perhaps six feet, or may be something shorter;
And from the Varne upon its English side,
'Tis parted by a channel two miles wide;
A ridge it is, although the Colbart named
By our neighbours opposite, and by whom 'tis claimed.

LXVII.

One fact there is on seamen to impress,—
That its South end lies South-east of Dungeness
A long way off; but another more worth knowing,
And which to Nature is no doubt owing,
Is that the North ends of both shoals are right
On the meridian of the South Foreland light;
The Varne three leagues distant, the Ridge four miles more,
And its North end nine from Cape Grisnez's shore.

LXVIII.

To clear the South-west end of this shoal, too,
Mount Lambert, near Boulogne, must bear South-east due;
While from its North-eastern end CAPE GRISNEZ light
Bears South-east half south superlatively bright,
In intervals *Revolving*, a just half minute each,
Unless within four leagues distant when they teach,
That instead of darkness, a faintish light appears,
Which has been the case for more than sixteen years.

LXIX.

On Kentish land by SOUTHERN FORELAND claimed,
In History's page of ancient lore oft named,
Appear on high two brilliant constant lights,
Fixed and alike, but yet of different heights;
East by South and West by North they stand,
And seen in line they clear the Goodwin Sand
Southward: about a quarter of a mile apart;
They're but poor specimens of early British art.

LXX.

Another purpose, too, the high light serves,
(Of these South Foreland lights) that well deserves
The seaman's notice:—that is off Folkestone's shore
Stand in no nearer when it 's seen no more
By land concealed. But other matters are at hand
Besides,—Britannia's Forelands before us stand,
Five leagues apart; which important space,
The Downs, the Goodwin, and its shoals embrace.

LXXI.

The seaman now must all his skill supply
When sailing here, with quick and watchful eye:
Would he the wreck avoid, let him beware
That dangers most insidious lurk there:
Beset by shoals and influenced by tide,
He drifts upon them, unless careful to provide
Against disaster! Let him beware the GOODWIN SAND,
Which pilot skill can sometimes scarce withstand.

LXXII.

Insatiate Goodwin, what number is enough
Of fragile ships, thy quicksands to engulf?
Thou cemet'ry of wrecks,—awaiting still
More and more spoils thy catacombs to fill!
Year after year thy scouts, the winds and tides,
Hurl distressed vessels on thy fatal sides;
Where no sooner left without assistance near,
In sands they sink and helpless disappear!

LXXIII.

Or if they're stranded on thine outer form,
There they remain the playthings of the storm;
Dashed into fragments bit by bit they go,
Or fall for ever into depths below!
Ah, who can tell the sad and dismal tale
Of all thy terrors in the ruthless gale?
Those torn by thee from kindred, brother, child,
When friendless snatched from off thy fearful wild.

LXXIV.

Yet there are those who by experience know
Thy dangers well, and well can undergo
The perils of the storm:—they too can brave
The sweeping force of thy terrific wave;
They with their noble boats have rescued oft
Many but for them inevitably lost!
Choice boatmen of Great Britain, they form a hardy race,
Of world-wide fame, and Deal their native place.

LXXV.

Why all this wreck? and why will ships be lost?
Why on the Goodwin must they still be tossed?
Are there not lights to guide them clear?
Have they not leadsmen, and other men to steer
Called seamen? Tides 'tis true are strong,
Winds often adverse, nights dark and long;
Severe the storm, with sleet and heavy sea,
The shoals mid darkness whiten in the lee!

LXXVI.

Then for what follows, such is too well known,
The wreck, the Goodwin, and then all are gone!
Yet why the wreck? Aye, let Martin say,
In a brief word and make it evident as day;
Precaution, he says, as all may see,
Is the true parent of security!
That word "Precaution," what does it imply?
Measures of safety ere the time 's gone by!

LXXVII.

Yet let the Muse a well earned tribute pay
To philanthropic men, who contemplate the way
That ships are sailed, and wrecked on our shore,
And feel for British seamen in sad peril's hour!
Who lashed to the wreck and torn by tortured main
Look round for succour, but, alas, in vain!
Yet not in vain! for the life-boat is at hand,
With difficulty launched from off the surf beat strand.

LXXVIII.

By whom provided? By their country? No!
By Britain's sons, a chosen few or so,
Assembled for doing good, whose deeds of love
And names are duly registered above
Better than here; preserved by them they save
From that which too often is the seaman's grave!
A good deed done,—self-approval wins!
"Charity covereth a multitude of sins!"

LXXIX.

Let us attempt in few words here to scan
This maze of shoals, but not without a plan
Of lights and buoys, in skilful order placed,
The ship to guard from dangers in this waste:
'Tis pilot's water, nevertheless we may
In a few words a general view convey
Of that attention and especial care,
That has been taken to preserve her there.

LXXX.

First then are seen, besides the Foreland lights,
Three lightships at their stations, ready for the nights;
The buoys by day; but too many there appear
Of these to be enumerated here:
The first ship off South Sand Head rides;
One light she bears, and nothing else besides,
Saving the usual mast-head ball at least;
And from the South Foreland is four miles due East.

LXXXI.

The second lightship bears the Gull Stream light,
Composed of two, and like the others bright;
One on each mast, and of equal height:
Steadily they shine as twin sisters of the night.
From that Queen of the Goodwin at the South Sand Head,
They bear North-north-east, two and a half leagues said;
In eight and a half fathoms, while the former 's in thirteen,
And no easy berth! though fit for Ocean Queen!

LXXXII.

Before us yet another lightship 's seen,
Gallantly braving the North Sea stream,
At the North Sand Head of all these sands,
Announcing the dangers which its light commands,
(To seamen who look out,) bearing three bright lights,
Visible as any in the darkest nights;
Like "three kings of the rake" in Orion's belt,
Plainly to be seen, and no less pleasing felt.

LXXXIII.

This King of the Goodwin at the North Sand Head,
Rides in nine fathoms exactly by the lead;
With the midship light higher than the rest,
And the "Twin" lights a large point South of West,
Distant near two leagues, the Foreland of the North
Six and a quarter miles, North-west half North.
These three light-ships thus judiciously are planned,
By the Trinity House Brethren of Deptford Strand.

LXXXIV.

Such is the system of the Goodwin lights,
Which by strictest care are kept to rights;
Plain and efficient:—but, now, within the sands,
Let 's see the care which the course demands:
Supposing that we start midway between
The Foreland lights and our Goodwin Queen
At the South Sand Head: North-east by north we take,
The course which leads us on towards the Brake.

LXXXV.

Four miles on that course, with allowance for the tide,
Will reach the Downs, that sheltered roadstead wide,
Where formerly "the British fleet was moored
When black eyed Susan came on board,"
As Dibdin sang, and poets sang the praise,
Of happy England in those momentous days;
And long before, when that same coast of Kent,
Was known to the Admirals of our Parliament!

LXXXVI.

Then, as by that course we onward steer,
The buoys of the Bunt and Brake we near:
The first being on our starboard hand,
The last to port,—an extensive sand
Four and a half miles long that Brake;
Yet between those buoys we have our course to make
And two and a half leagues from whence we first set out,
Brings us to the "Twin" lights, or thereabout.

LXXXVII.

Passing these lights upon our starboard hand,
The course is changed to North-east from the land;
Leaving then some other buoys to port,
Three of which we may here report,
The Middle Brake, the North Bar, and the Gull,
And to starboard the buoy of the Goodwin knoll,
Thus of these sands we now get free,
And may keep this course for the cold North Sea.

LXXXVIII.

The outer edge or "back" of the Goodwin Sand,
Is two long leagues distant from the land;
By four buoy beacons it is well defined,
With the King and Queen of the sand combined:
Of tidal influence in passing it beware,
Read what says Martins' experience there,
Well have they shown from observation found,
When the flood tide 's nipped, how the wind backs round.

LXXXIX.

The Goodwin has detained us rather long,
But not unworthily, for it would be wrong
To leave unsaid the little that is here
Stated of its lights, and navigation clear:
Since then we have passed between it and the shore,
How to avoid it outside must be said before
'Tis left: This the North Sand Head light
Will enable us to do both by day and night.

XC.

Never bring that light to bear the least
Eastward of North by East half East:
If from the South end you would be clearer,
Be careful, always, to stand no nearer
Than to have the South Sand Head light,
Nothing South of West half South in sight.
But the angle of 85° between the Foreland lights,
All parts of the sand will clear by days or nights.

XCI.

Goodwin farewell; although thy fatal sands
Too oft find victims in too numerous bands;
Still dost thou perform a useful part
For fleets employed in war or peaceful art!
Without thee where 's the shelter of thy sandy mounds?
Without thee where 's the safety of the quiet Downs?
So like the world;—thy virtues go for nought,
While all thy evils are before us brought!

XCII.

Ramsgate next calls for our attention here,—
A harbour dry, but formed by handsome pier:
Green lights it boasts,—one of which turns Red
When ten feet water are at the West pier head:
Which last with another (Green) on western height
In line, shows the channel, and leads in at night:
The two Green lights are visible from South,
When less than ten feet are in the harbour's mouth.

XCIII.

Yet let us onward, nor longer here delay,
The FORELAND now to double, and then haste away:
See its *Fixed* light in ancient tower doth burn,
Beaming forth welcome at this important turn,
To Britain's argosies, rich with foreign hoard;
A last adieu to others on their way abroad!
The first sea light to these, to us the last,
The Thames we're nearing and the tide runs fast.

XCIV.

Passed it is indeed, our last sea light,
And all around us, even to cliffs of white,
The fact confirms;—for see the river craft,
The fleets of ships with canvas fore and aft,
Are crowded; while before us is one wide maze
Of shoals, of buoys, of lightships' blaze!
Stay,—not lightships all, for by law, at night
All ships both sail and steam must carry light.

XCV.

Ah, where is the freedom of the wide blue sea?
Beware collision now, or harm will fall to thee!
Quick eyes must look about, and quicker hands
Give prompt obedience to quick commands!
The anxious pilot seeks the EAST TONGUE light;
Formed of two separate, the upper bright,
The lower red, both fixed, in Prince's Channel wide,
Moored in ten fathoms near its South-east side.

XCVI.

Shall we attempt the pilot's way to scan,
In channels through this labyrinth of man?
The muse would fail;—yet an idea might convey
Of that pursued, and that alone by day!
Thus, in that channel, to port the East Tongue light,
Course West-north-west, league and half outright;
Leaving to starboard the western light that's in it,
Revolving and flashing thrice in every minute.

XCVII.

A point to starboard, now, the course is changed,
Approaching to port, the South GIRDLER light, arranged
To revolve in minutes two, while flashes four,
Appear in that interval, and not one more!
A league on that course,—then for the Oaze Deep,
A course North one-third East, a long mile we keep;
When West three-quarters North six miles more
And five to West-north-west will reach the NORE,
Whose light *Revolves* twice a minute as before.

XCVIII.

Such the proceeding, but there is yet beside,
Good judgment wanted in allowance for the tide;
This custom only teaches, that habit of the eye,
Which has buoys besides to seek, in order to pass by
On proper hand; to starboard this, or even that to port;
And though last not least, in cares of every sort,
The hand-lead 's ever going, yes, ever and anon,
For pilot, seaman, landsman, the *sine qua non*.

XCIX.

The theme's exhausted,—yet in these our days,
Novelties arise, which full oft amaze,
As being eccentric from the usual range
Of this world's ways, so jealous of all change!
The Beacon Light 's intended for the shore,
As is well known, although some are more
Of an amphibious nature, and ride afloat,
In vessels not much larger than a common boat.

C.

And wherefore not, for boats do often go to sea,
And can easily take care of you or me,
But what if her Lightship be constructed round
As any punch-bowl! Oh, horror most profound,
Exclaims the seaman;—never will I lend
My support to such a truly worthless end!
'Tis against the dictates of common sense!
And madness in its favour patronage to dispense!

CI.

And yet it's gravely meant without mistake,
In sober reason this attempt to make
In deeper water, and further out from land,
Than any light-ship can yet command:
Certain advantages, 'tis said, she will possess
In riding easily at sea, and with much less
Chance of parting her cable:—in fact, she 's never
From her anchors to be allowed to sever!

CII.

As to inventions, look at steam afloat,
See how derided was the first steam-boat
Which ocean crossed, and proved him no philosopher
(Although he might have read Alexander Ross over)
Who that opinion first set going,
And would by the world be thought most knowing;
For she showed him, although a mathematician,
In spite of his sines and cosines he was no magician.

CIII.

Look at the wonders of the photographic art,
How Nature's smallest secrets they impart;
And going to other things from photography,
See the application of chemistry to geography!
How the engraver's art, even to multiplicity,
At pleasure 's increased by galvanic electricity;
Proving that it was rightly said, when inclined,
"Who shall place limits to the human mind?"

CIV.

Take courage, then, inventors, from such facts,
In soul and body nor your works relax;
Well do we know the body 's made of clay,
The every dictate of that soul to obey!
Earthborn is that, but of Heaven this,
And rightly employed unless in works amiss
To benefit mankind, as meant by the Creator,
And imitate His blessed Son, *hominorum Salvator!*

Some few wrong statements having crept into the lines on this subject in our last number, the reader is requested to make the following corrections :—

In Stanza V. The Seven Stones have two *Fixed* lights, and are three leagues from Scilly.

VI. The Wolf is twelve miles from the Seven Stones.

And from the Longships he South-west stands,
And West-north-west eight leagues from Cornish lands.

—That is, the Lizard.

VII. The Lizard lights stand E.b.N. and W.b.S.

XXXI. The Portland lights stand N.N.W.½W. and S.S.E.½E.

XLIV. *Red* from West southward to S.E.½S.,—not S.E.b.E.

These few matters, which would immediately catch the seaman's eye, are corrected, as well as a few additions made, in the separate little handbook of the Lyrics, that will also contain a chart and annotations.

TRADING TO THE DANUBE.

[For the information of his countrymen trading to Galatz, M. le Capitaine de Fregate Roussin has addressed them the following. Our own commanders may find it useful, along with that in our last volume signed "A Sea Dog."]

Report from Captain Roussin from his station at the Danube.

On Board the Averne, Galatz, 19th Dec., 1858.

Dear Admiral,—There are now only eight or nine feet of water on the Sulina bar, the only channel by which the Danube is now entered. Those vessels which draw very little water must be adopted, in order that they may not be obliged to lighten by discharging cargo. Ships of 200 or 300 tons burden, and as flat as possible, are to be preferred for the same reason. This is, indeed, the size of most of those which come here; but they are frequently too frail in their build, and meet with disasters in consequence.

There are two active seasons of navigation in the Danube: the spring, when vessels come for the grain of the preceding year; and autumn, taking away the produce of the last harvest. In spring they should arrive as nearly as possible towards the end of March, at which period the ice has disappeared; and by managing their business quickly they may get away before the sickly season begins, which is dangerous to crews little cared for and often overworked. For the autumn season they should be in the Danube at latest about the end of October; otherwise they will not be able to take in cargo and sail before the river freezes, and will therefore stand a chance of being detained two or three months in the ice.

The passage from European ports West of the Danube being generally delayed by northerly winds in the archipelago, vessels should leave England in August and the ports of the Mediterranean in September at latest.

The navigation of the Black Sea is not so difficult as that of the channel. Our commanders have no occasion for alarm about it, or to imagine that they must have a pilot at Constantinople. If they leave the Bosphorus in fine weather they will soon find room enough in it to profit by the wind by making long boards. The Isle of Serpents presents a capital land-mark for the mouths of the Danube. It is very steep to, tolerably high, and has a light-house visible at the distance of eighteen miles.

Moreover, most of the pilots shipped at Constantinople, not only for the Black Sea, but also the Danube, are unworthy of confidence. They may have made a voyage or two to the Danube, but do not know the ports of refuge to be found on the coast of Bulgaria, and still less the shoals and wrecks of vessels that obstruct the mouth of the Sulina. Commanders of ships cannot be too strongly cautioned against being led by their advice, and especially when they reach the mouth of the Sulina, and to be careful not to attempt crossing the bar without having a chartered pilot on board.

On leaving Constantinople, commanders should take care to make themselves acquainted with the signals of the Sulina tower. If on arriving there the flag forbidding them to enter is hoisted at the lighthouse, they should keep out to sea; or, if they prefer to anchor, should take an anchorage at a good distance from the coast to the N.E. of the entrance to the river.

If, on the contrary, a port pilot proposes entering, they must be very exact in stating the depth of water the vessel draws, so that it may be determined, according to the state of the bar, whether it be necessary to lighten her.

Should the wind be scant or the swell at the mouth might occasion her touching, a steam tug should be adopted without hesitation. There are now four of these towing craft, belonging to private individuals, whose commanders are ready for a bargain; and, as competition has lowered their charges, their services may be had for passing the bar for £4.

After entering the river a pilot is engaged for going up it. In

this negociation, as well as in the towing vessels, it is always best to consult the port-captain or the English consul, who is in charge of French affairs.

The pilotage of the river, like that of the towing vessels in, is not regulated by the direction of the port. They are entirely free, and left open to the first comers; and in consequence there is much squabbling and difficulty to obtain justice. There being no stated charges, the pilots, and especially the owners of the tugs, demand various prices, according to the season and the amount of navigation. It becomes, therefore, quite necessary to fall back on the current charges at the time.

Vessels arriving late in the Danube—for instance, in November or December—and those which, on account of their greater size, can better afford the expenses of entering, have certainly the advantage of being towed direct to the loading port, for it is always a long and tedious business to get up to Sulina. For most of the time they are generally towed up by ropes. They are often a month or more in reaching Galatz, which is only thirty-five leagues from the sea. Much time is thus lost, and if the season is much advanced they run the chance of being surprised by the ice. Our captains generally hesitate to make use of the tugs. They do not like to run risks, trusting to avoid them with the chance of a fair wind. But they are too often deceived, and those vessels which succeed best in the Danube are those which take tugs.

As soon as a vessel has embarked her cargo she descends the river with the tide. The larger are obliged before leaving the port to place part of their cargo in the tug, and this has always to be done before crossing the bar at the mouth of the river. But commanders cannot be too much on their guard against the persons employed on this duty. They should take care to keep their grain as near to them as possible, in order to prevent it from being stolen, a case which often happens. They may also expect to be deceived in the measure, and to be imposed on in every possible way, on pretext of damages, delays, &c., requiring the greatest vigilance to avoid.

Large vessels should embark all or the greater part of their cargoes in the tugs of the Austrian Company, that while towing serve them as lighters, from the port whence they ship their cargo as far as Sulina. Taking advantage of a fine day they run with them over the bar to sea, where the shifting of the cargo occupies a few hours. The charges of the Austrian Company are not unreasonable, and are those of an honest management. This towing method of proceeding up the river being rapid and sure, is undoubtedly the best for large vessels. Several English vessels of 400 tons or more, have employed them this autumn. I advised two French commanders to follow their example on arriving about the end of November, and now they are at Sulina ready for departure. In my opinion it is always best to take advantage of steam in the Danube.

There is still another difficulty to which the commanders of mer-

chant ships are exposed in the Danube, and against which they should be on their guard. Nearly all the French vessels are freighted by commercial firms established in England. They first go to Constantinople, from whence they are directed to corresponding agents at Galatz or Ibraila, a change of agents which is often the cause of much annoyance.

The trade in grain which is carried on at Galatz is quite a speculation, and as much is made in the hire of ships as by dealing in grain. Hence it is that vessels hired for two or three months and do not reach the Danube till the freight is reduced, can no longer obtain their cargoes on the conditions originally agreed on by their charter parties. If the rate of their freights is advantageous to the consignees these are ready to hasten the business; but if, on the contrary, they anticipate loss in carrying out the contract, they endeavour by every means to shirk it.

A French commander finds that his consignee has failed, another can find his no where, and both are thus compelled to seek fresh charterers. Some have even seen their cargo sold at a considerable loss; and it is thus that the consignees get clear of their engagement when they find, from the price of grain in England, that they will be losers there. This power of negociating the charter of a vessel is an old custom, and it would doubtless be impossible to avoid it; but commanders desiring not to be the victims of such a traffic, should take care to secure in their agreement that if the cargo is sold at a reduction, and they ship another at a different value, the difference should be made up to them. The French consul at Ibraila obtained this for a vessel; but other commanders, tired out by the delay and difficulties which they meet with, left without receiving the difference due to them, and they would have great trouble in recovering it afterwards.

Shipowners cannot be too careful in drawing up agreements as to the chartering of their vessels. They are often written in English, and some commanders do not take the trouble to have them translated or explained. One of them on reaching the Danube was surprised to find that by the agreement his consignee had the power of sending him to Giurgewo to take cargo, one hundred and eighty miles above Ibraila, which is the last port to which sailing vessels go from the Black Sea. In order to avoid going these one hundred and eighty miles against the strong currents of the river, he was compelled to agree to a reduction in his freight, which in the first instance was no higher than those of vessels going to Galatz or Ibraila.

Lord Elgin's Expedition to Hankow.

The importance in a political and commercial point of view, combined with the geographical interest that attaches to the expedition up the Yang-tsze-Kiang which has just been accomplished, seem to impose the obligation upon those who have returned from it of furnishing the public with some account of the character and capabilities of that celebrated river, as well as of the varied incidents which attended its exploration. It does, indeed, rarely fall to the lot of those engaged in an enterprise of such a nature to add to the interest of traversing unknown waters, and to the pleasure of gazing for the first time upon scenes never yet described, the excitement of forcing their way through a hostile country, and the satisfaction of achieving a valuable political result.

Captain Osborn, and the officers under his command, deserve the highest credit for the success which has attended this effort to penetrate into the interior of China, and although they are now condemned to pass, in all probability, some months in the heart of the country, they must derive no small consolation from the consciousness of the fact that, in ascending for the first time an unknown river for a distance of upwards of 600 miles from its mouth, in a ship of 1,300 tons, and drawing 16 feet of water, they have accomplished a feat unrivalled in the annals of inland navigation and river exploration.

We have been favoured with the following interesting narrative of the expedition, which we are permitted to give in the writer's own words:

The squadron, consisting of the *Retribution*, *Furious*, *Cruizer*, *Dove*, and *Lee*, it will be remembered, left the mouth of the Shanghai river on the morning of the 9th of last November.

For the first week we made but little progress, in consequence of the total change which had taken place in the bed of the river; the old charts served rather to mislead than to assist us; before long every ship had discovered a sand bank for itself in a manner more convincing than agreeable, and the only incidents which marked our progress were those which occurred to check it.

The *Dove* and *Lee*, however, proved themselves indefatigable pioneers for the larger ships, and on the morning of the 16th we were gratified by the sight of Silver Island. We were just feasting our eyes on the magnificent prospect afforded by the reach which opens up Chinkiang-foo and Golden Island, when the *Furious* suddenly attracted universal attention by striking on a sunken rock in the channel between Silver Island and the shore, in a spot marked 16 fathoms in the chart, and which the whole British fleet had passed in 1842 without discovering. It was only by the removal of 260 tons, and the most unremitting exertions for three days, that she was at last released from her disagreeable position, without having, so far as it was possible to discover, sustained any material damage.

The delay enabled some of the party to visit the city of Chinkiang, and here for the first time we came in contact with those scenes

of desolation and of ruin which bore evidence of rebel occupation, and which afterwards became so painfully familiar to us. Both in the suburb and city tumble down walls and heaps of rubbish extended over the vast area once densely inhabited, and the deserted streets were now overgrown with weeds so rank and sturdy that they seemed to have entered into permanent possession. There was not a semblance of trade or business of any sort going on in the two or three streets which are still partially inhabited by a few woe-begone citizens. On the 20th we were once more under way, and at 4h. p.m. came in sight of Nankin.

As it had been determined to avoid if possible any collision with the rebels, but at the same time not to recognise in them any right or title to oppose our advance up the river of a friendly power by entering into negotiations with them on the subject, the *Lee* was sent about a mile in advance of the squadron, with Mr. Wade on board, to communicate only in the event of any message coming off from the rebels in the first instance. With a gaze of intense interest we followed the little vessel as she steamed fearlessly past one battery after another. At last, just as she seemed to us to have passed them all, and sighs of disappointment were escaping from the bosoms of numerous naval heroes at the prospect of a peaceful passage, a little white puff of smoke sent the blood once more coursing through their veins, and the cheery pipe and hoarse beat to quarters started the deck of every ship into full life and activity.

In obedience to her instructions, the *Lee* was no sooner fired upon than Lieut. Jones hoisted a large white flag of truce. This was fired upon eight times in rapid succession, and as the 'engage' signal was by this time flying from the *Retribution's* mast-head, it was promptly replied to by each ship as she came abreast of the first battery.

It was now nearly five o'clock, and for the remaining half hour of daylight a pretty smart cannonade was kept up on both sides. The *Retribution* lost one marine, killed; Mr. Midshipman Birch lost an arm, and a blue-jacket was wounded so severely in the leg that it was afterwards amputated at the thigh.

Considering that the vessels were all the while in motion, the firing on the part of the rebels was better than could have been expected. All the ships were hulled with their shot. Lord Elgin, who remained on deck during the action, while standing on the paddle-box, was nearly struck by a round shot, which cut a rope a few feet over his head. Another was found afterwards in his cabin, and two passed through his barge. Fortunately no casualties occurred either on board the *Furious* or any other ship. Shortly after 5h. p.m. all the forts were passed and we took up a position for the night about two miles above the city.

It appears Lord Elgin thoroughly agreed with Captains Barker and Osborn in thinking that no time should be lost in inflicting summary chastisement on the rebels for the temerity of which they had been guilty, for day had scarcely dawned when the ships began to drop down with the tide opposite the city, the *Cruizer* engaging the

fort on the North side of the river, which is here about 1,000 yards broad, and the remaining ships those on the South. From the pertinacity with which they had stuck to their guns on the previous evening, we were fully prepared for a warm reception; so far from such being the case, however, the rebels replied but feebly to the heavy fire of shot, shell, and rockets to which they were now treated.

In about half an hour all the forts were effectually silenced, without any loss to ourselves, and at the end of a bombardment of an hour and a half the work of destruction and intimidation seemed sufficiently complete to warrant our leaving them to profit by the lesson they had received, and to compare the fire of the barbarian devil-ships with that of the Imperial junks, which had now come to take an inglorious share in the action by firing at their enemies at a two-mile range.

Leaving them to continue their uninteresting game of very long bowls, we pushed on, and passed, shortly after, another Imperial junk fleet engaging a rebel fort. As none of the shot were directed at us we did not interfere. From the ship's tops we could discern the beleaguering hosts of the Imperialist army, crowning the hills in rear of Nankin, their encampments forming a complete and extended semicircle round the devoted city which they have been so long and ineffectually engaged in beseiging.

In the course of the same afternoon some flaunting rebels in gay colours had the audacity to wave defiant flags and fire gingalls at us, but when they brought a gun to bear upon us from a small redoubt, we considered the joke had gone far enough, and after two or three shots from the *Retribution* and *Furious* a well directed 68-pounder from the former knocked the whole of their gingerbread fort into smithereens, and sent its occupants scampering over the open plain, their long yellow and red robes streaming in the wind, in ludicrous dismay and confusion. That night we anchored near the rebel city of Taining, from whence, in consequence, doubtless, of the affair at the redoubt, we received amicable overtures, which, however, were very curtly responded to. On the following day we were again delayed by shoals, and did not reach the rebel town of Woohoo till the afternoon of the 23rd. Here again our prestige had preceded us, and we were received with so much civility by the insurgents that some of us landed, and were treated with great politeness by their chief, a Canton man of a low type, surrounded by a disorderly rabble of opium-smoking disreputable-looking men and youths—the latter in preponderance, tricked out in the usual show of gaudy plumage. Altogether we were most unfavourably impressed with the general aspect of these gentry, whose religious knowledge consisted but of a confused jumble of the persons of the God-head, and whose practice, to judge by the scourge they have proved to the country, the reputation they have left behind them, and their own admission, is far below that of professing Christians generally.

In consequence of the great draught of water of the *Retribution*, it was decided to leave that ship at the Imperialist port of Kew-hsien,

about twenty-five miles above Woohoo. With the exception of this town, and one or two unimportant places near it, the whole South bank from Nankin to Ganking, a distance of 150 miles, is in the hands of the rebels. They also hold some isolated strong posts on the North side—such as Pukow, opposite Nanking, and the Western Pillar Hill, a picturesque pass through which the river forces itself after passing Woohoo. It was not, however, until we approached Kew-hsien that the scenery became invested with that picturesque charm which it so eminently possesses as we advanced further. Near this point wooded hills swell in gentle slopes from the water's edge, and green fertile valleys, now desolate, open up the range. At one place the beauty of the scenery received quite a theatrical effect from a most picturesque battle which was taking place between the rebel and imperialist forces. Though the fire was by no means serious, the waving flags and bright costumes of the advancing and retreating hosts imparted an air of lively animation to the scene. It is singular that notwithstanding the fact of the rebels being in possession of so many miles of the banks of the river, they did not own a junk upon its waters. Wherever the Imperialists have a post upon it junk fleets are stationed, though they are not able to keep up any inter-communication.

Leaving the *Retribution* at Kew-hsien, we arrived on the 26th off the rebel city of Ganking; as this is their last post up the river, and one which has been for some time besieged by the Imperialist forces, we anticipated some opposition to our progress; in this we were not disappointed. The ships no sooner came within range than a battery, from the centre of which rises a beautiful pagoda, opened fire upon them. A ten minutes' bombardment sent the whole of the brave garrison flying into the plains in rear, where the Imperialist army, taking advantage of the diversion we had created in their favour, were rapidly advancing to the attack. Had they possessed the smallest enterprise, they might have carried the work without losing a man. While they were hesitating, however, we moved on, and the rebels rushed in hastily and reoccupied the fort.

We steamed close under the city walls, on which we counted upwards of twenty guns, without molestation; but from some unaccountable reason the last battery favoured us with a few parting shots, which we returned with interest and then passed on. We had now got clear of the rebel country, and the only anxiety which remained as to our onward progress was confined to that passive species of resistance offered by sand banks. These began to get serious as we approached the Poyang Lake, at the embouchure of which large and constantly shifting deposits render the navigation most intricate. Mountains 5,000 feet high mark this outlet, and the scenery is on a grander scale than we had hitherto seen. The Seoukoo-Shan or Little Orphan hill, an isolated mass of rock, is a particularly striking object, rising like a pillar to a height of 250 feet out of the river. A temple has been let, like a piece of enamel, into the sheer face of the precipitous cliff. The town of Hookow is perched on a projecting bluff of

rock, and seems to stand sentry over the entrance to the Poyang Lake.

We now for the first time began to observe a few trading junks moving about the river, but the population had at no time since our entry into the Yang-tsze-Kiang appeared so dense as to justify the fabulous accounts which have heretofore been current on the subject. Doubtless the rebels have done much to cause this diminution; but it would appear problematical whether at any time there has been any extensive traffic on its waters. Wherever the hills do not approach the water the country is liable to great inundations, which may also in some measure account for the absence of population.

Kewkiang, an important provincial city, with a wall enclosing a vast area of ground, we found to be in a state precisely similar to Chinkiang; indeed it would be difficult to convey any adequate notion of the desolation and misery which mark the course of the rebel incursion, as though some fiery finger had touched the face of the smiling country, and left behind a festering scar which will take many years to heal.

The finest scenery on the river is near Kechow, not many miles beyond Kewkiang; at this point the mighty stream forces itself between steep mountains, and at one point these approach so close together as to form a fine gorge. The ranges do not exceed 2,000 feet in height, and are of a wild rocky character, reminding one strongly of the Western Highlands of Scotland.

In consequence of the difficulties of navigation and sundry delays on the sand banks, it was not until the 6th of December that we were cheered by the view of our long wished for destination, which we had latterly begun to suspect existed only in the disturbed brain of some imaginative Chinaman.

The first view of Han-kow is eminently disappointing; as seen from the neighbouring heights it does not seem to cover an area greater than the western suburb of Canton, while the city of Han-yang, situated on the opposite side of the Han, which here joins the Yan-tsze, is now a mere heap of ruins, and has at no time been a city of any extent. But the provincial of Woochang, which occupies a noble site on the southern shore, in some measure compensates by its handsome appearanee and great extent for the comparative meanness of its neighbours. Unfortunately it too has had its history of sieges and defences, and miles of ruins attest the melancholy fact. Hankow is, however, much belied by its external aspect, and in this instance, as in many others, a first impression is apt to mislead. The streets are handsomer and broader, and the shops loftier and better stocked than those of any city now open to Europeans, while there was an air of activity and bustle in the streets, quite refreshing after the torpor and apathy which had succeeded the rebel reign elsewhere, although two years have scarcely elapsed since every house in Hankow was destroyed by fire by the rebels, who did their work so thoroughly that we were assured not a single house remained standing. The greater part of the ruins have already given place to the new abodes

of a persevering and industrious population, who cannot afford to let the mercantile emporium of this section of the empire follow the example of its large walled cities. The Han River, a small tributary about a hundred yards broad, contained more junks than we had seen during the whole course of our voyage, while the streets were crowded with natives of almost every province in the empire. Not, however, that any vast population had yet collected in this once popular mart. A million of souls is I think a liberal allowance for the present united population of the three cities, while in their palmiest days it did not probably exceed a third of Père Huc's fabulous estimate of eight millions.

The appearance of four foreign ships anchored close off the town, two of which towered above the surrounding river craft like Brobdignag ships among fleets of Lilliput, attracted immense crowds of spectators, who lined the banks from morning till night during our week's stay, or came on voyages of inspection, and were never tired of paddling round the ships as though they were specimens of naval architecture just arrived from an unknown aquatic globe. The shopkeepers and persons generally with whom we conversed manifested a unanimous desire for trade, and expressed great satisfaction at learning that in all probability the port would soon be opened for this purpose. In the shops we observed a fair proportion of Manchester calicoes, shirtings, piece goods, &c. In so hurried a visit, however, it was difficult to form any accurate estimate of the trading capabilities of the place, beyond the patent fact that it was the entrepot of the productions of the adjoining provinces and the most natural and convenient point from which any demand which might exist in them for foreign manufactures should be supplied.

Among those productions, tea, cotton, indigo, coal, sugar, are the most prominent; minerals of various descriptions, insect or vegetable wax, furs, besides great quantities of flax, hemp, and cereals generally, are also important articles of inland traffic.

On the 10th Lord Elgin, accompanied by about thirty diplomatic and naval officers, paid a visit of ceremony to Kwan, the governor-general of the provinces of Hunan and Hupeh, whose official residence is in Woochang. We were much struck with the appearance of the town, and the reception of the ambassador by the governor-general was most flattering. His excellency was surrounded by all the provincial and civil authorities in their state dresses, and an elaborate entertainment was provided in a style far surpassing in elegance and taste the ordinary official banquet, which always plays so important a part in Chinese ceremonials.

This visit was returned by the governor-general on the following day. The state junk was towed across the Yang-tsze by half a dozen smaller craft and propelled by crowds of rowers. The fluttering of hundreds of gaudy Chinese flags with which they were decorated, the crowds of minor junks by which they were surrounded, the gay appearance of our ships dressed out and with yards manned, the thunder of our salutes as it mingled with the small artillery of the

junks, the dense crowds of people everywhere, and the bright autumn sun shining on all, combined to form a 'spectacle' which to our eyes added to the charm of its brilliancy the interest of novelty, and which to the good folks of Hankow must have appeared an unrivalled and astounding pageant.

On the following day we left Hankow on our return voyage, and proceeded most prosperously for the first thirty miles; soon, however, we discovered to our dismay that the river was rapidly falling, and that the sandbanks we had passed with such difficulty on our way up were now several feet nearer the surface. Thanks to the energy, skill, and indefatigable exertions of Captain Osborn and the Master of the *Furious* (Mr. Court), the *Furious* was forced over one after another of these obstacles. The *Cruizer*, most ably handled by Captain Bythesea, and drawing less water, followed more easily; while the gunboats proved themselves invaluable pioneers, and were incessantly occupied in dashing frantically about the river in vain endeavours to find deep water.

At last, after a week had been spent in accomplishing 130 miles and the *Furious* had established her reputation as a splendid goer across country, we reached the bar at the Poyang Lake, on which there was now only eleven feet of water, and which, although her draught was reduced to fifteen feet, was a fence at which even the *Furious* did not feel justified in going at. During the interval which had elapsed since our last visit the water had fallen seven feet at this point. It was therefore decided that Lord Elgin, accompanied by the entire mission, should abandon the *Furious* and *Cruizer*, and proceed with the *Dove* and *Lee* to rejoin the *Retribution*.

The *Dove* started with twelve 'cabin passengers' in the most literal sense of the term, for there was only one cabin for them all—and the *Lee* with ten. On parting with the ship which had been Lord Elgin's home for the last year, he addressed Captain Osborn, the officers, and men, in a farewell speech, and amid many regrets and leave-takings, and loud and prolonged cheers from both sides, the two little gunboats, with their closely-packed freight, skimmed away down the rapid waters of the Yang-tsze-Kiang.

In two days we reached Nganking, but with our slender force the circumstances under which we were now approaching it were very different from those on the former occasion. As the channel led us within fifty yards of a row of guns of which we had a lively recollection, and as the last thing we had communicated to these rebels had been a cannon ball, it was deemed wise to send off a boat to discover the humour they were in.

Mr. Wade, therefore, was despatched to demand an apology for the treatment we had received on the way up, and to inform them that a recurrence of such conduct would render it necessary for us to hand every rebel city on the banks of the river over to the Imperialists. The rebels expressed the utmost contrition for what had happened, assured Mr. Wade that the guns had been fired by subordinates, who had paid the penalty of their mistake by being be-

headed and disembowelled, and that not only were we free to come and go as we chose, but that we were welcome to visit their city. Mr. Wade declined this offer. In a few minutes more we were safely past all the batteries, and next evening reached the *Retribution*.

On the 29th the three ships reached Nankin, and Mr Wade landed, charged with a similar message, and accompanied by Messrs. Oliphant, Lay, and Wylie. These gentlemen, after a long ride of five or six miles, reached the residence of Le, the third rebel chief in command. They describe the same scene of ruin and desolation to exist inside the walls of Nankin as we had witnessed in other cities of rebel occupation; and, from proclamations and other sources, gathered the impression that the besieged were becoming very hard pressed. They were confirmed in this suspicion by the secret proposal made by a rebel of some standing to take advantage of our visit to desert his colours under our safe conduct.

The same expressions of regret for what had taken place when we passed Nankin were also made use of by this chief, and the same assurances given that those who were not killed by our shot were beheaded. He stated that the number of killed on that occasion amounted to twenty, besides three officers and a good many wounded. Arrangements were further made for safe and uninterrupted communication with the ships up the river. It is not too much to assert that these arrangements could in all probability not have been made so satisfactorily had not the rebels furnished us with an opportunity of proving our power to punish any breach of faith.

After leaving Chinkiang the *Lee*, with the mission still on board, pushed on in advance, and reached Shanghai on New Year's-day, having accomplished the voyage from the *Furious* in eight days.

North China Herald.

Deep Sea Soundings.

One of the most interesting branches of hydrographic research in these days is that of deep sounding, presenting a wide field of investigation, and no very expensive one when carried on by the system adopted by the United States Government. For seamen, it has the advantage of refuting the existence of reported rocks. Thus it has shown that the rock reported East of Malta was an idle fabrication; one which has cost this country a considerable sum in the expenses of ships sent to look for it.

Another rock which it has blown out of water is the Devil Rock, in the Bay of Biscay, a very old offender in the same way; and the *Dolphin's* voyage served some others in the same manner, that we need not now stop to name.

In the first volume of this journal we inserted a report of Lieut.

Sainthill, R.N., to the late Hydrographer, Sir Francis Beaufort, on a cast of a hundred fathoms which he found between the Azores and Newfoundland, that has remained in the chart ever since. The deep soundings made for the Atlantic Cable by Commander Dayman would seem to throw doubt on the existence of this bank, for we find this officer saying in his report printed by the Admiralty, in allusion to the space which he had examined between Newfoundland and the Azores,—

"In this space and near the Newfoundland Bank is a narrow belt of water of unknown depth, in which was obtained one cast of 3,000 fathoms without bottom. This sounding having been made very near the spot in which 100 fathoms are marked on the chart, on the authority of Lieut. Sainthill, R.N., would appear to disprove the existence of this vigia, as well as of one or two others noted in *Purdy's Directory for the Atlantic Ocean* as having been reported near the same position."

The distance of the 3,000 cast without bottom does not appear, but from the positions we have inferred it to be about thirty-two miles, and this may be more or less, owing to error in reckoning. However this may be, the following extract of a letter on the subject has been sent to us in reference to the above observation:—

"I delayed acknowledging the receipt of the pamphlet in hopes of finding my log-book with the particulars of our soundings in the *Beaufort*, in 1832. But I have been unsuccessful, and can only tell you that I am perfectly convinced we touched bottom; which Captain Dayman would call *an excellent up and down cast.* And as my chief mate, W. Whiteley, when we saw the lead was on the ground, jumped over into the main chains and hauled up the slack, the 100 fathom mark was just awash, and the line so nearly perpendicular that we considered that the true depth.

"The arming of the lead showed sharp rocky bottom of fine bluish ashes. The water was very much discoloured, which induced me to try for soundings; and my opinion is that we were over a submarine volcano in a state of eruption. My chronometer may have been half a degree wrong, and if Captain Dayman happened to have an error the other way, there would be plenty of room for the mountain and the valley: as, for instance, from the peak of Tenerife to the deep sea is a smaller distance.

"In twenty-six years also the levelling power of oceanic currents would reduce the height of my mountain very considerably; but of course not to destroy the lofty lump which I expect will be found somewhere thereabouts *when the Atlantic is thoroughly examined.*"

Now, the nearest distance of the peak of Tenerife from the sea is not nine miles, by Admiral Vidal's survey; which peak rises in that short distance to 12,180 feet above its level. It therefore appears to us that Lieut. Sainthill's observation is fully justified. If an actual rise of more than 12,000 feet can take place in nine miles, how easy does a change of more than 3,000 feet appear to be in thirty, setting aside error in position, alluded to by him. Without, therefore, ques-

tioning in the slightest degree the authenticity of Captain Dayman's soundings—in which we have as much confidence as himself,—we are inclined to agree with Lieut. Sainthill that his "*bluish ashes*" are not to be set aside, and that somewhere near the position he has given, his mountain will be found "when the Atlantic Ocean is thoroughly examined."

Nautical Notices.

The Gulf of Martaban—*Maulmain—Sittang River: Deficiency of the Charts.*

Maulmain, December 20th, 1858.

Dear Sir,—Supplementary to the list of disabled ships at Maulmain lately furnished, I have to add the ship *Otahah*, lost a few days since on the sands lying off the Sittang River, immediately North of Amherst. There have been several other vessels wrecked on these sands, of which I only recollect the *Henzai Queen*, the *Clarissa*, and the steam frigate *Muzuffer*. The latter vessel was wrecked about twenty miles eastward of Rangoon Bar, but may justly be placed in the same catalogue, for the whole coast between Rangoon River and Amherst is lined with sand banks of the same dangerous character to which the motto "*Nemo me impune lacessit*," may be aptly applied.

I have on several occasions noticed the dangerous character of these sands in the pages of the *Nautical Magazine*, and do so again in the hope that some account of them may be published in Horsburgh's or other reliable Directory. For at present any sailing directions for this part of the coast that I have seen are singularly vague. Horsburgh's directions for Rangoon have, since the establishment of a light-ship and pilots outside, become obsolete; while those for Maulmain are summed up in a few lines and not much to the purpose. I should think the entrance to Maulmain and Rangoon Rivers, and the coast between them, entitled to a chapter to themselves, considering the importance they have arrived at. In the meantime, and until the subject be taken up and clear directions published, I would suggest a line in *red* being drawn on the chart, say from about China Bakeer on the West side to Double Island on the East, to warn ships not to cross to the northward of it but on their peril until the pilot or pilots' ground be fairly in sight, or they are otherwise perfectly certain of their position, and the state of the tide is *known*, not guessed at, which is a very different thing.

Lest it should be thought that I am making more of these sands and tides than they deserve, I can assure you that all the vessels I have named were commanded by skilful seamen, who were well acquainted with the coast, but they have probably under estimated the strength of the tides. This of course is conjecture, but naturally

occurs to me, as the same thing had nearly happened with myself on one occasion, which I may mention, by way of bearing out my opinion of these dangers.

On a voyage, some twenty-five years ago, from the isle of France to Rangoon, I had reached soundings, thick weather, no land in sight, no observations; but trusting to local acquaintance I ran in until I got into 4 fathoms, where I ought to have seen something if in the *right place;* but seeing nothing, I suspected we were *not* right, and anchored. Found a strong flood tide running, while by my calculation it should have been turned to ebb. I further began to suspect we might be driving, and as the lead was of no use, let go another anchor to make sure, when the very disagreeable fact that we were driving proved itself by the water rushing in at the hawse holes whenever the second anchor had cable enough out to make it bite the ground, and I fancy we even then drove slowly, with both anchors ahead; for such a tide I had never dreamed of before. We got out safely on the ebb, with a good fright and a firm resolution never again to tamper with the sands at the head of the gulf of Martaban. This happened near about the place where the *Muzuffer* was lost.

By the way, I was a passenger in the barque *Coll Bunney* when she went to the *Muzuffer's* assistance by order of Commodore Lambert. Much to my disgust it was neap tides then, and we managed to lie at anchor for a few days, and received a quantity of her stores on board, but at great risk to her crew, in the boats. We left on the first spring tide, and I believe the *Muzuffer* rolled over and disappeared shortly after.

Connected with the same subject, although not strictly with the nautical part of it, I beg also to state what I saw of the bore of the Sittang River from the shore. Travelling in the Pegu country some eighteen years ago for pleasure, I arranged and timed my journey so as to reach the bank of the Sittang River at full moon in April, when the tides run at the strongest. Pitching my tent (a covered cart drawn by two buffaloes) at I suppose five miles from the mouth of the river, I saw right out to seaward, and at low water it was all dry sand, excepting a narrow channel here and there where the river found its way out among the sands. The first indication I observed of the flood coming, was a distant haze and a low noise out to seaward. This rapidly thickened to a light brown smoke, and as it came nearer a dash of foam broke out of the smoke here and there, and presently the first wave came distinct in view, standing erect like a wall, broken into foam at the top. This was followed by others less and less in height, and when the whole rushed past, the river, which just before had been nearly all dry, was full from bank to bank. It was a very grand sight viewed on shore, but what could ship or boat do if caught on such a tide?

Commodore Lynch, during the war with Burmah, had been informed that this river was "not so bad as was supposed," and that it was quite practicable to send troops and stores to the interior by it. On being applied to for information, I stated to the commodore what I

had seen, leaving him to judge for himself. The question being one of importance, he very properly settled it himself by going round in a steamer in the neaps and judging on the spot. I do not know how far up he went, but on the first rise of the springs the steamer had to clap on full power to enable her to hold on against the flood. Since which no more has been said about "navigating the Sittang."

To conclude, and draw a moral out of this tale about these sands, let us point out the mode of keeping clear of them, confining our remarks to approaching Maulmain. From what is above stated it will be seen that those acquainted with the coast, shall we say *too* well acquainted, myself included, are more apt to tamper with them than strangers; but to all I would say, that in approaching Maulmain from the westward, do not come under 15 fathoms until the eastern coast is made, and Calegouk or Double Island in sight and *known*. The Zingat Hills will probably be seen before, but they are not a good mark, lying so far inland that a ship may alter her position a good deal before any perceptible difference of their bearing is observed. Besides, they lie so far North that using them for a mark to steer by brings you too near the tail of the sands. The lead will then be the best guide, with a wholesome dread of the flood tide as your greatest enemy. For the same reason I object to placing a light on Amherst Point, as being too far North, and a ship steering for it would be skirting the sands. I can easily imagine a ship coming from the westward, either by day or night, and steering as she would be most likely to do for the light, a spring flood tide setting her right across her course at a rate faster than she was sailing, and getting aground on the sands before the light was seen, and further I argue that the fact of a light being there would induce ships to steer for it instead of steering a safer course more to the southward.

For these reasons I think if we are to have a light it should be so placed as to draw ships away from the dangers instead of leading them into their vicinity. But as I have stated before, I see no need for a light for Amherst at all. The place is perfectly safe to approach, by doing so from the southward, and no ship has any business to the northward of it; nor I imagine, are strangers likely to go there, unless they are induced to do so by this *ill advised intended light.*

I am, &c.,

J. H. MILLER.

To the Editor of the Nautical Magazine.

DALHOUSIE AND BASSEIN.

Sailing Directions for Entering the Harbour of Dalhousie.

Lat. 16° 7′ N., long. 94° 27′ E.

Vessels of 14 feet draught and upwards should on no account attempt the passage to the westward of Negrais Island.

Vessels coming from the southward should bring Diamond Island to bear N.W., then steer for it until the fairway buoy is visible, which is situated 1½ mile N.E. of the island. Steer N.N.E. from this buoy until black buoy bears East, then N.E.b.N.

Vessels entering from the westward in latitude North of Diamond Island, should bring it to bear S.E., steer in for it until the fairway buoy is made, then proceed as above directed for vessels entering from the southward. This passage, however, should be attempted by sailing vessels only in the N.E. monsoon.

Vessels unable from stress of weather to distinguish the different marks, should anchor under Diamond Island, where good anchorage and smooth water is to be found.

Lieutenant Ward's chart of the Bassein River is an excellent guide, and vessels provided with it scarcely need pilots.

The following buoys are now laid for the guidance of commanders and masters:—

A first class red buoy marks the extreme South end of the Orestes Shoal.

A first class red buoy marks the extreme limit of the Orestes Shoal.

A first class black buoy marks the extreme edge of the shoal extending from Porian shore.

A first class red buoy marked "Fairway" in white letters is placed 1½ mile N.E. of Diamond Island.

N.B. The shoal extending South of Negrais Island is now called the Orestes Shoal, and that extending from the Porian shore westward, the "Porian."

Sailing Directions from Dalhousie or Negrais Island to Bassein.

A vessel should proceed up the river about half a mile from the shore, until up to Yea Jone Creek; from thence she should sheer over to eastern bank gradually until the black buoy on the South end of the ridge shoal is seen, which is to be passed, keeping it on the port hand about two cables' length, and keep eastern bank until after passing the red and white buoys in the same manner as the black; then stand up mid-channel, passing the Sesostris Rocks, which are buoyed with a red buoy. The rocks lie inshore of the buoy. Keep on mid-channel until close up to Enterprise Island, taking care to give the spit a berth that extends a little way down from the South end of the island. There is a passage on each side of the island, one to the East and one to the West. The passage to the left is preferable for a ship of light draught, as it is wide, and there is more room to work.

The passage to the eastward is taken by vessels of large draught. Vessels should keep close to the eastern shore in order to avoid the Pariah Rock.

In sailing up the passage left of Enterprise Island, care must be taken not to approach too close to the spit that extends North of the

island. Proceed up as far as the village of Toman Dewa, that lies in a creek on the port hand; then steer across to eastern bank between the red buoys, and Elephant Island, going nearer to the island than the buoy, until you get into seven fathoms; then steer up on the eastern shore, until abreast of the Pamawaddie River; from this steer over towards Ashby Rocks buoy, giving the Cackatoo Rocks a berth of at least two cables' length. These rocks are seen above water, except at spring tides, when they are covered. There are three patches: two of them show above water half ebb to half flood; one is sunken and extends to 138 yards outside the others; the least water on it at dead low water spring tide is sixteen feet. Keep the port shore until you reach the second creek, when the channel becomes much wider.

The junction is so called from being at the top or North end of Napoota Reach, where two branches of the river meet, the one from the East being the way to Bassein.

At Napoota Reach you may steer up until approaching the junction, where on the eastern shore, a mud bank extends a quarter of a cable's length from the bushes; there is also a bank extending from the port side. These can be avoided by keeping in nearly mid-channel. In the third reach there is a bank of mud, which will be known by a white board in the bushes. On the port hand this shoal extends nearly half way over, and the whole length of the reach in which it is, so that vessels must keep the starboard bank going up, and *vice versa* coming down. The remainder of the passage upwards is without danger, and easy of navigation.

There is deep water close to the bank, and the ground chiefly very soft mud. Vessels should have a small warp anchor in readiness to run out if required, and should use a light working anchor for dropping; this will relieve the crew of a quantity of labour.

Vessels should show their numbers before arriving at the village of Takion, and masters should report their arrival at the Master-Attendant's office and Custom House as soon as possible.

T. W. AYLESBURY, *Lieut. I. N.*,
Master-Attendant.

NEGRAIS RIVER.—*Port Dalhousie and the Port of Bassein: Delta of the Irawaddy.*

Bassein having become within the last five years a place of rapidly increasing importance as a rice port, principally owing to the cheapness of the article and the safe and easy manner in which vessels are loaded, we have been induced to lay before the public the accompanying memoranda with reference to the trade of the port, with a hope that it may prove useful:—

Rice can be husked at Bassein throughout the whole season, but the bulk of the crop is generally shipped between the months of January and May, the rice being brought in the greatest quantities to the market during February and March. New rice may be procured in December, but it is not husked and brought freely to market before January. Rice husked between May and October is liable to get heated, if kept long in store or shipped to Europe.

Ships loading at Bassein generally get dispatch; still, twenty-five to fifty lay days, according to size, should be allowed for chartered vessels. In the event, however, of the cargo having been secured before arrival, twenty-five days are sufficient for the loading of a ship of 140 tons. Even in the wet weather the loading is not generally stopped, the rice being principally shipped from covered wharfs to the vessels lying alongside.

Of the numerous kinds of rice growing in the vicinity, *Ngasain* and *Pyoo-dong* are the most suitable for the European market; the larger descriptions of the former kind, however, are generally preferred. *Pyoo-dong*, although of a large white grain, being soft, does not keep so well on a long voyage. Of the other kinds of rice, none have as yet been so abundantly brought to market as to deserve separate notice, but are generally mixed together, for shipment to the straits and China, for which they are well suited, being principally of a long fine grain.

Purchases are generally made from the rice boats after arrival at Bassein. Advances, however, are sometimes made.

The growers, being principally Karens, seldom husk the paddy, and consequently supplies are not stopped whilst they are engaged in field operations. Few labourers having as yet come to Bassein from Chittagong or Madras, the husking operations are generally carried on by the Burmese.

Gunny bags are always to be had at Bassein.

Company's rupees are at present the only current money at Bassein; other coins could only be disposed of for their intrinsic value. Gold leaf can also be sold, but, unless at a reduced value, only in small quantities.

Specie can be forwarded at present from Calcutta *via* Rangoon by fortnightly steamers, or by vessels direct to Bassein. Drafts can generally be obtained at the Rangoon Treasury on Bassein.

D. BROWN,
Deputy Commissioner Bassein.

Rate of Pilotage to Bassein from Dalhousie.

		Rupees.
Below and up to 10 feet draught	per foot	5
From 10 feet to 14 feet	,,	7
,, 14 ,, 18 ,, ...	,,	9
,, 18 ,, 20 ,, ...	,,	11
,, 20 ,, and upwards	,,	12

To Dalhousie from Sea.

	Rs.	Ans.
Below and up to 10 feet draught	2	8
From 10 feet to 14 feet	3	0
„ 14 „ 18 „	3	8
„ 18 „ 20 „	4	0
„ 20 „ and upwards	6	0

For each day's detention the masters are to pay the pilots 16 rupees, in addition to their regular pilotage.

The rate of pilotage outward will be the same as inward for all vessels up to 17 feet, above (17) ¼ more. This rule is applicable to the rates of pilotage from Diamond Island to Dalhousie only.

Masters of vessels are requested to apply for pilots at the master attendant's office forty-eight hour before leaving; the pilotage to be deposited at the above office.

Bassein Port Rules.

1.—No vessel of above 200 tons shall enter within the limits of the port of Bassein, or move from one place to another within the port, between sunset and sunrise, without the special permission of the master attendant.

2.—The commanders of all vessels arriving at the port of Bassein are desired to enter correctly, in the columns of the report book of the master attendant, as soon as presented to them, the information therein required regarding their vessels. They will also report, in writing, to the master attendant the particulars noted in the form appended hereto.

3.—All commanders of vessels arriving at Bassein shall anchor in such a position as the master attendant or his assistant shall direct. All vessels shall moor with two bower anchors, each way, and shall not move from their position without a pilot, except with the express permission of the same authority.

4.—All commanders of vessels shall have their jib and driver booms rigged in when required by the master attendant, and shall strike their yards and masts if required to do so by the master attendant.

5—The commanders of all vessels entering the port of Bassein with ballast on board, shall without delay send to the master attendant a report, in writing, stating the description of the ballast in hand, the quantity in tons, and the port of shipment. Application must be made by the commander to the master attendant for permission to tranship or land ballast, and no ballast shall be transhipped or landed except under the sanction of the master attendant, and only at such stations as he shall direct.

6.—A free channel is to be kept for ships moving up and down the river within the port, and always free passages to piers, jetties, landing places, wharves, quays, docks, and moorings; and all vessels shall be bound to move when required to clear such channels or passages.

7.—All vessels within the port of Bassein shall be moored or warped from place to place as required by the master attendant, or other officer of the port, and no vessel shall cast off a warp that has been made fast to her to assist a vessel in mooring without being required so to do by the pilot or officer in charge of the vessel mooring.

8.—No vessels within the limit of Bassein (port) shall boil any pitch or dammer on board or shall draw off spirits by candle or other artificial lights.

9.—All vessels within the limits of the channels leading to the port of Bassein shall, when at anchor, between sunset and sunrise, have a good light hoisted at the starboard fore-yard-arm; and all vessels under way at night shall show a good light at the fore royal or upper fore mast-head, and when under way, in tow of a steamer, shall in addition to the mast-head light, show a good light at each fore yard-arm, the steamer showing the usual light prescribed by the Admiralty regulations.

T. W. Aylesbury, *Lieut. I.N.*
Master Attendant.

Singapore to Australia,—*the Eastern Route.*

Sir,—Your number for this month commences with a paper on the routes from Singapore to New Caledonia and the North-East coast of Australia. In writing of the Eastern Passage Route, the following remarks occur:—"The passage to the eastward along the North coast of New Guinea is well known to the whalers of the Pacific, who, when they have drifted off their fishing grounds by the easterly winds, recover their positions by taking advantage of the westerly winds which prevail at this season near the line, and extend far into the Pacific. But these experienced navigators rarely publish their notes, being satisfied with making their passages in the shortest time, without caring whether others adopt them or not."

Now, sir, by referring to the first paper in your volume for 1843, entitled "Winds and Currents of the Pacific Ocean," it will be seen that one of these navigators has published his notes in the *Nautical*, and that he there endeavours to show not only that a passage can be made from the Indian Archipelago to any part of the Pacific Ocean in East longitude, including of course Australia and New Zealand, from the beginning of December to the end of March; but that during all times of the year a passage may be made by keeping northward of the equatorial current and between the trades, or in what are usually called the "Horse Latitudes," say from 2° to 4° North.

The westerly monsoon blows as strongly and steadily during December, January, February, and until about the middle of March, along the North side of New Guinea, and along the equator to the

longitude of 170° E. or thereabouts, as in any part of the Indian Ocean whatever, and during this season it is quite certain that a quicker passage would be made by this route from Singapore to the points you have named than could possibly be done by the Indian Ocean, and with considerably less sea and heavy weather.

The paper which I sent you in 1843 was written entirely with the view of showing the practicability of these passages which you have been now discussing.

I beg also to be permitted to draw attention to the notice of a shoal which I sent you about the same time, and which I see has been wrongly placed in Horsburgh's charts. There is a clear statement of the shoal given in the *Nautical Magazine* for 1843, page 417. It will be there seen that the very dangerous coral patch seen by me lies outside or to the S.W.b.W. of the shoal called Merope's Shoal, which latter shoal lies W.N.W. from the Appo Islands about ten miles. Whoever has inserted it in the chart has made the mistake of placing it between the Merope Shoal and the Appo Islands, instead of, as before stated, about five miles to the S.W.b.W. or outside of that shoal. There can be no mistake about their relative positions, as in passing between the shoals I had them both in sight and the Appo Islands at the same time (from the mast-head).

I may also observe that the shoal called Merope was first seen by me, and reported to Captain Blaxland of the *Merope*, who merely had an earlier opportunity of making it known. Further to corroborate the existence and position of this dangerous nine feet rock,—On visiting the *Oregone* French frigate, Capt. Cecille, at Manila, he informed me that Captain Rosamel of a French sloop of war whose name I have forgotten, in passing this locality saw a heavy breaker and hove his ship to, but did not see it again, nor did he send his boat to examine it, but reported it as a danger, placing it within a mile of the position which I had assigned to it.

I am, &c.,

ROBT. L. HUNTER.

To the Editor of the Nautical Magazine.

[Our old and valued correspondent, Capt. Hunter, will perceive our remark in p. 182.—ED.]

DANGERS ON THE COAST OF TANASSERIM AND PEGU.

Globe Terrace, Forest Gate, Essex,
21st March, 1859.

Sir,—With respect to Roe's Bank, it is surprising that it has not been reported on since its discovery in 1825. I have repeatedly passed in its locality (with a good look out from aloft) before I discovered its existence in long. 96° 42′ E. and lat. 10° 2′ N.* I have

* I ascertained its position by good observations at the time.

sounded on it and seen the rocks. It is about one mile in extent S.S.E. and N.N.W.

There is a shoal discovered by me* in long. 97° 10′ E. and 10° 20′ N. lat.†, which is not laid down in any published chart. I was on it at daylight with light southerly breezes. My attention having been drawn to it by the presence of several sharks. The first cast of the lead had 7 fathoms, with overfalls from 10 to 18 fathoms until 8h. a.m., when I lowered a boat to try the current, and found it setting slightly to the N.W. At 9h. tacked, (with the aid of a boat,) and at 9.30 got on the shoal again, carrying soundings until 11.30 a.m. of (not less than) 8 fathoms. The rocks, sand, and weed, (alternately,) being plainly visible. The sea at the time perfectly smooth. It appeared to be 2½ to 3 miles in extent W.N.W. and E.S.E. The next day I sighted the Seyer Islands, and had observations before and after noon. [There seems to be a singular deficiency of a good chart of this coast.—Ed.]

The patch of rocks discovered by me in February, 1855,‡ is S.W. ½ W. from the Great Savage Lighthouse at the entrance of Akyab River, and distant thirteen miles|| W.b.S. ½ S. from the table land of the Western Bolongo, and W.N.W. from the South extreme of this island, with only 4¼ fathoms on them, probably less, and in the direct track of vessels. There are 20 fathoms close to the westward and southward of them, 15 fathoms to the eastward, and 13 fathoms between them and the Oyster Reef. From which danger they bear S.S.E. nearly, distant about eleven miles. And from the fact of my having passed over them three different times within two years, and each time found less water, I am led to suppose that ere long they will prove a very formidable danger in the absence of any distinguishing mark.§

I have, &c.,

N. Heckford.

To the Editor of the Nautical Magazine.

* My report on this shoal appeared in the *Singapore Straits Times*. I am not certain as to the date I discovered it. But I think it was on the 12th May, 1849, and may err as to minute particulars. I have written to India to refer to records on the subject.

† Its position was ascertained at the time and verified by observations the following day.

‡ I am in possession of correspondence from the Superintendant Marine (Calcutta, dated April, 1855,) relative to this shoal.

|| The upper part of the lighthouse is just visible above the horizon when on the shoal.

§ In the first edition of my Sailing Directions and Coasting Guide I pointed out the best positions for lighthouses, lighhtvessels, and beacons for the coast and islands comprised within the latitude of Akyab and that of Callagouk, on the coast of Martaban, considering the act fully justified by my very long experience on this coast.

With reference to the bank discovered by me in lat. 10° 20′ N. and long. 97° 10′ E., it has been known in India as Heckford Bank, by which appellation I trust it may be called for the future.

The shoal discovered by me S.W. ½ W. from the lighthouse on the Great

Particulars of Lights Recently Established.

(Continued from page 164.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
10. Fiume	45° 18·7′ N., 14° 25·5′ E.	Adriatic	F.	28	4	Est 1st Mar., '59. Red. On Mole Head.
11. Andros Island	37° 59·3′ N., 24° 47·2′ E.	Archipelago	R.	708	30	Est. 27th Feb., '59. On North extreme of island. Period three minutes.
12. Kyholin	In Kattegat	.....	..	..	..	Discontinued on 1st April, '59.
Swinemunde	East Mole Head	Stettin	..	..	..	To be altered to a red light.

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

No 11.—This appears to be one of the new lights (and most useful too) established by the Greek Government. The authorities with whom rests the publication of the notice do not seem to be aware that with *revolving* lights the mariner looks not only for the period of revolution, but also for the intervals of *light* and *darkness* within that period.—Ed.

In No. 1 Remarks in our last number *for* S.E.b.E. *read* S.E.½S.

List of Charts *Published and Corrected by the Hydrographic Office, Admiralty, in March*, 1859.

Scotland, West coast, Captains Robinson and Otter, Commanders Bedford and Wood, R.N., 1858, (3s. 6d.)

Nova Scotia, Pope Harbour to Liscomb Harbour, Captain Bayfield, R.N., 1857, (4s.)

Nova Scotia, Ship Harbour, Captain Bayfield, R.N., 1854, (3s.)

North America, West coast, Juan de Fuca Strait, Becher and Pedder Bays, corrected to 1859, (1s. 6d.)

Mediterranean Lights, corrected to April, 1859, by Commander Dunsterville, R.N., (1s.)

Admiralty, 21*st March*, 1859.

Harbours of Refuge.

The Refuge Harbours Commissioners, appointed in conformity with the recommendation of the Committee of last session, have at length placed the result of their investigations before Parliament, in the shape of a lengthy, elaborate, and, for the most part, a highly satisfactory document. The mass of evidence with which the Commission has had to deal was supplied from so many sources, and frequently so

Savage Rock, (Akyab River,) may I hope be named Heckford Rock or Patch.

conflicting, that it was by no means an easy task to arrive at a distinct conclusion even with regard to those localities on which the Committee had expressed a decided opinion; and that such a conclusion has been arrived at as will satisfy most nautical men of its correctness, is creditable to the Commission, and justifies the favourable comments with which we announced some months since the commence of its labours.

The Commissioners take the annual loss of property from casualties on our coast at £1,500,000, and the average loss of life thence resulting, in the six years from 1852 to 1857 inclusive, at 780 persons annually. With this state of facts in view they proceeded to discharge the trust committed to them by the Crown, and, in the exercise of that trust, to lay, in the matter of the construction of Harbours of Refuge, the basis of a "national policy." They accordingly laid down a system by which their recommendation for aid from the national resources should be guided, which in practice has been applied thus:—"They divide those harbours to which their attention has been directed into two classes—"Life Harbours," of which "facility of access and sufficient shelter are the only essential requisites;" and Refuge Harbours in the wide acceptation of the term, where vessels can take shelter in bad weather and contrary winds, "for the purpose of avoiding the risks and wear and tear incurred by keeping the sea, and the loss of life occasioned by being driven back." When the advantage accruing from the construction of a harbour of either class is confined exclusively to the passing trade, the Commissioners regard the benefit conferred on navigation to be "solely national," and, in all such cases, consider the expense of construction should be defrayed by a grant solely from the public funds. Where the benefit accruing from the construction is divided between the passing and the local trade, the expense of construction is recommended to be defrayed partly by a grant and partly by funds raised in the locality. Where the benefit to the passing trade is purely incidental, and the local interests concerned are large, the wealth and enterprise of the commercial community affording unimpeachable security, the Commissioners recommend "a loan in aid of the construction of the harbour, the proportionate amount of which will depend on the degree of refuge derived by the passing trade;" and in all cases the area of all harbours "created in whole or part by the expenditure of the public funds," should be placed under the direct control of the Government.

Such are the principles on which the Commissioners have recommended the application of the public money to the sites named in the Report, those principles forming not only a guide for the present, but the outline of a policy. From the tabular statement which follows, showing the sites recommended by the Commissioners, it will be seen that the sum required by way of loan for the purpose of constructing these harbours will not be less than £1,268,000.

Tabular Statement of the Cost of Construction of the Harbours proposed by the Commissioners.

Site.	Grant.	Sum to be raised in the locality.	
		Total.	Of which provided.
	£.	£.	
Wick	125,000	125,000	25,000 by British Fishery Society.
Peterhead	100,000	200,000	
Carlingford	50,000		
Waterford	50,000		
Douglas, Isle of Man	50,000	50,000	32,000 by Island Harbour Commission.
St. Ives	400,000		
Padstow	40,000		
Tyne River	250,000	750,000	300,000 by Tyne Improvement Commission.
Hartlepool.....	500,000	500,000	
Filey	800,000		
	2,365,000	1,625,000	£357,000
Sums proposed by the Select Committee of the House of Commons	2,000,000		
Excess	365,000		

In thus briefly noticing the recommendations of the Refuge Harbour Commission we are bound to say that the Commissioners have acquitted themselves of the serious trust reposed in them, with judgment and fidelity, and that their recommendations are the result, in the main, of a fair and sagacious consideration of the evidence. In saying this, we do not by any means under-estimate the amount of local pressure to which we well know the Commission must have been subjected.

On the subject of Passing Tolls, as connected with the support of the projected harbours, we shall have something to say on a future occasion. To these brief remarks we have only to add that the Report is one of the most important documents, and the most interesting to the Mercantile Marine of this country, which has for a considerable period been presented to Parliament.

Mitchell's Maritime Register.

New Books.

THE VARIATION AND DEVIATION OF THE COMPASS RECTIFIED BY AZIMUTH AND ALTITUDE TABLES, &c.,—*By P. Cameron.* Glasgow.

Mr Cameron's treatise on the elementary principles of magnetism preceding these tables, cannot fail to be appreciated by those for whom it is meant. The theory of the adjustment of the compass by magnets is treated by him at length; but the principal feature in the work before us is the judicious arrangement of his azimuth and altitude tables. In the former, the arguments of latitude, declination, and time from the meridian (hour angle), give the seaman at a glance the true azimuth required; by comparing which with his compass he ascertains at once the amount of deviation and variation combined. The range of the latitudes are from the equator to the parallel of 80° N. or S.; and of the declination from 0° to 23½° N. or S. In the altitude table the sun's true altitude is given at different hours from the meridian, with the same range of declination, viz., from 0° to 23½°, and the latitude from the equator to the parallel of 60° N. or S.

Mr. Cameron introduces to the reader his Dial Compass, merely an azimuth card (fitted with a magnetic needle), on the centre of which is fixed a style, made of fine brass wire or other suitable metal, about 2½ inches in length. A line is to be drawn, parallel with the ship's keel, on the top of the companion or skylight, and the centre of the dial placed on this line. Should the sun's rays be strong enough to produce shadow, and the ship's head changed in direction, it will be evident that if the shadow pass over one point, the compass, if correct, will indicate one point likewise, and whatever be the difference indicated is the deviation of that point. For, suppose the shadow to indicate two points and the compass one and a half, this would at once show half a point of deviation on the compass. This mode of verifying the table of deviations is only available in very fine weather.

Several useful tables are added, with examples of their use.

Mr. Cameron, it appears, is also the inventor of the Slide Rule, the use of which he explains by the solution of practical questions in navigation, an instrument that will be found useful as a check on calculation.

A MEMOIR OF CAPTAIN W. THORNTON BATE, R.N.,—*By the Rev. J. Baillie, Gonville and Caius College, Cambridge.* Longman, London, 1859.

We have here the genuine impressions of a warm and generous heart, such as may be expected to be seen in the private journal of a British seaman, whose loss we have recorded in our last year's volume. The journal records the impressions of scenes in the trying duties of the Palawan survey, scientific duties (as well as general) but too ill appreciated we regret to say in Her Majesty's naval service, and also those during the siege of Canton, in which their author fell. The perusal will well repay him who undertakes it, and as we find that the proceeds of the work are to be applied to those charitable objects in which the author interested himself, it may be said to have some more than ordinary claim to patronage, for Bate himself speaks in every line.

LIGHTHOUSE ILLUMINATION.—*Being a Description of the Holophotal System and of Azimuth Condensing and Apparent Lights, &c.,—By T. Stevenson, F.R.S.E., C. E.* London, Weale.

If to Fresnel belongs, as it no doubt does, the credit of introducing the system of building the dioptric lens for our lighthouses, to Stevenson belongs that of its application to them and the addition of the holophotal (all-saving) system,—as well as the azimuthal system for lighting channels, throwing as

it were an accidental illuminating ray to show out or to avoid a danger. The perfect manner in which every particle of light is used in these days is in good keeping with the improvement which is every where seen. The object of the present treatise is to explain the principles of the new system, by which, as is shown by the author, the utmost can be obtained from a single source of light. We commend this highly approved invention of Mr. Thomas Stevenson, with the valuable treatise, in Weale's Library, of Mr. Alan Stevenson, to the attention of those who wish for the best system of lighthouse illumination.

Meteorological Reports of the Board of Trade, *No.* 1 *to* 3

One of the most important steps in the history of meteorology resulting from the patronage accorded to this important subject will appear hereafter in the reform of the barometer. So truly philosophical an instrument, and one of so much value to the seaman, required to be looked to from authority, for its imperfect construction had become notorious, and the different readings between different instruments in no wise creditable to this country. Thanks to the earnestness with which the subject has been taken up, one standard and portable barometer is now common afloat,—and not only afloat, but at those observing stations which were established in following out the measures of the government in reference to the whole subject. The other instruments of temperature and moisture also received similar attention, and we have now before us the few first numbers published from the office committed to the direction of Admiral FitzRoy. We confine ourselves to a general statement of their contents, such as our limited space will at present only admit.

In the first number, following the introductory remarks, we have the indicatory letters and figures, being the Beaufort Notation and "another method," in which, although six figures are lost, the gain is not apparent; but we have an interesting addition in the force exerted on the square foot, expressed by the figures in each of the above notations. This is followed by a series of observations made at the following stations:—Bermuda, 1853–4; Halifax, 1854–5, also Ascension and Valparaiso; Ceylon, 1854, Point de Galle, Trincomalee, and Colombo. The Menzies typhoon in the China Sea of 19th May, 1855. A series of deep sea temperatures not much over 400 fathoms, showing the lowest to be 43° at that depth. Then we have some important directions for observers; followed by Captain Drury's excellent paper on New Zealand meteorology, which we have already transferred into our own pages. The same follows of the Cape and also the Mauritius, accompanied by an interesting discussion on the whole subject of hurricanes in connection with the trades and monsoons in that most important quarter. We have then a meteorological journal of H.M.S. *Scorpion* on the isthmus of Darien and Carthagena; and some important remarks on the barometer and other instruments useful at sea concludes the first number of these valuable papers.

The second number is commenced with a passage table, or number of days' passage between different ports throughout the world, followed by an abstract of general sailing directions, a branch of nautical pursuit involving almost the whole art of navigation. As these papers have large circulation, we have no doubt our commanders have profited by the numerous hints on many important subjects which this part contains, concluded by Maury's paper comparing sailing voyages only with those of sail and steam.

In the third paper we come at once to the subject of hurricanes—the storms, a subject which, with the mode by which the winds are observed to change in the two hemispheres, occupy amply the whole number.

It is gratifying to see the very important subject of sea meteorology thus patronised by the Government of this maritime country, and we shall look forward to some great results derived from it as a consequence which must eventually follow.

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

MAY, 1859.

A Glance at Early Portuguese Navigation—*as it was nearly Three Centuries ago.*

It is both profitable and interesting sometimes to look back into the history of the past in the early days of navigation. We turn from the picture of the rude and ill contrived appliances for effecting a purpose, with a kind of pity for those who employed them, to those of our own day followed by a feeling of satisfaction at our superiority, and perhaps with an improved respect and regard for those great advantages which we enjoy. These will be tolerably evident on the perusal of an extract from the "voyages and trauailes" of a Dutchman named John Hugen van Linschoten, who embarked with the early Portuguese; and being an observing individual, given to collecting information as he went through life, has left behind him an account of his voyages and what he saw, affording a good insight to the mode of navigation as well as management of their ships by those early Portuguese on their voyages to India. From Linschoten's book then we propose making a few extracts, commencing with his embarkation, in accordance with that spirit of adventure which induced him, as it has done many others since, to seek his fortune in a foreign land, with the laudable view of finding an independence and enlarging the boundaries of knowledge.

The Voyage into the East or Portingale Indies.

Being young, and living idlelye in my native countrie, sometimes applying my selfe to the reading of histories, and straunge adven-

tures, wherein I tooke no small delight, I found my minde so-much addicted to see and trauaile into strange countries, thereby to seeke some adventure, that in the end to satisfie myselfe I determined, and was fully resolved, for a time to leave my native countrie, and my friendes (although it greeved me) yet the hope I had to accomplish my desire, together with the resolution, taken in the end overcame my affection and put me in good comfort to take the matter upon me, trusting in God that he would further my intent. Which done, being resolved, thereupon I tooke leave of my parents, who as then dwelt at Enckhuysen, and being ready to imbark my selfe I went to a fleete of ships 'that as then lay before the Tassell,'[1] staying the winde to sayle for Spaine and Portingale, where I imbarked my selfe in a ship that was bound for S. Lucas de Barameda, being determined tc travaile unto Sivill, where as I then had two bretheren that had continued there certaine years before: so to helpe my selfe the better, and by their meanes to know the manner and custome of those countries, as also to learne the Spanish tongue.

And the 6: of December, in the yere of our Lord 1576 we put out of y^e^ Tassel (being in about 80 ships) and set our course for Spain, and the ninth of the same month, wee passed betweene Dover and Callis, and within three dayes after wee had the sight of the Cape of Finisterra, and the fifteene of the same moneth we saw the land of Sintra, otherwise called the Cape Roexant,[2] from whence the river Tigio, or Tagus, runneth into the maine sea, uppon the which river lieth the famous citie of Lisbone, when some of our fleet put in and left us.

The 2 Chapter.

The beginning of my Voyage into the East or Portingale Indies.

Staying at Lisbone, the trade of marchandize there not being great by reason of the newe and fresh disagreeing of the Spaniards and Portingales, occasion being offered to accomplish my desire, there was at the same time in Lisbon a monke of S. Dominicks order, named Don frey Vicente de Fonseca, of a noble house: who by reason of his great learning, had of long time beene Chaplen unto Sebastian king of Portingale, who beeing with him in the battaile of Barbarie, where king Sebastian was slain, was taken prisoner, and from thence ransomed, whose learning and good behaviour beeing known to the king of Spaine, hee made great account of him, placing him in his own chappel, and desiring to prefer him, the Archbishopricke of all the Indies beeing voide, with confirmation of the Pope he invested him therewith, although he refused to accept it, fearing the long and tedious travaile he had to make thether, but in the end through the king's perswasion, he took it upon him, with promise within foure or five yeares at the furthest to recall him home againe, and to give him a better place in Portingale, with the which promise he took the voyage upon him. I thinking upon my affaires, used all meanes I could to get into his service and with him to tra-

vaile the voyage which I so much desired, which fell out as I could wish * * * and we prepared ourselves to make our voyage being in all five ships of the burthen of fourteene or fifteene hundreth tunnes each ship, their names were the Admirall S. Phillip: the vize Admirall S. Jacob. These were two new ships, one bearing the name of the king, the other of his sonne, the other three, S. Laurence, S. Francisco and our shippe S. Salvator.

Upon the eight of Aprill, being Good Friday in the yeare of our Lorde 1583 which commonly is the time when their ships set sayle within four or five dayes under, or over, we altogether issued out of the River of Lisbone aud put to sea, setting our course for the islands of Madera, and so putting our trust in God, without whose favour and helpe we can doe nothing, and all our actions are but vaine, we sayled forwards.

Chapter 3.

The Manner and Order used in the Ships in their Indian Voyages.

The shippes are commonly charged with foure or five hundred men at the least, sometimes more, sometimes lesse, as there are souldiers and saylers to bee found. When they go out they are but lightly laden, only with certain pipes of wine and oyle, and some small quantitie of marchandize, other thing have they not in but balast, and victuals for the company, for that the most and greatest ware that is commonly sent into India, are rials of eight, because the principall factors for pepper doe every yere send a great quantitie of mony, therewith to buy pepper, as also divers particular merchants as being the least ware that men can carry into India: for that in these rials of eight they gain at the least forty per cento.

When the ships are out of the river, and enter into the sea, all their men are mustered, as well saylers, as souldiers, and such as are founde absent and left on land being registered in the bookes, are marked by the purser, that at their returne they may talke with their suerties, (for that every man putteth in suerties) and the goodes of such as are absent, being found in the ship are presently brought forth and prised, and an inventorie thereof being made, it is left to be disposed at the captaines pleasure. The like is done with their goods that die in the ship, but little of it cometh to the owners hands, being imbeseled and privily made away.

The master and pilot have for their whole voyage forth and home againe, each man 120 millreyes,[3] every millreyes being worth in Dutch money seven guilders, and because the reck of Portingale monie is onely in one sort of money called Reyes, which is the smalest monie to bee founde in that countrie, and although it be never so great a summe you do receave, yet it is alwaies reckoned by Reyes, whereof 160 is as much as a keysers gilderne, or four rials of silver: so that two reyes are foure pence, and one reye two pence of Holland money. I have thought good to set it downe, the better to shew and make you understand the accounts they use by reyes in the countrie of Portingale.

But returning to our matter, I say the master and pilot doe receave beforehand, each man twenty-foure millreyes, besides that they have chambers both under in the ship, and cabbins above the hatches, as also primage, and certain tunnes fraught. The like have all the other officers of the ship according to their degrees, and although they receave money in hand, yet it costeth them more in giftes before they get their places, which are given by favour and good will of the Proveador, which is the chiefe officer of the Admiraltie, and yet there is no certaine ordinance for their payes, for that it is daily altered: but let us reckon the pay which is commonly given according to the ordinance and maner of our ship for that yeare.

The chief boteswain hath for his whole pay 50 millreyes, and receaveth ten in ready money: The guardian, that is the quarter master 14 millreyes the month, and for fraught 28, and receaveth seven millreyes in ready money: The seto piloto, which is the masters mate, hath 12, which is three duckets the month, and as much fraught as the quarter master: two carpenters, and two callafaren which helpe them, have each man foure duckets a month, and 39 millreyes fraught. The steward that giveth out their meate and drinke and the Merinho, which is he that imprisoneth men aborde, and hath charge of all the munition and powder, with the delivering forth of the same, have each man a millreye the month, and 23 millreyes fraught besides their chambers and freedome of custome, as also all other officers, saylers, pikemen, shot, &c. have every man after the rate, and every one that serveth in the ship.

The cooper hath three duckets a month and 39 millreyes fraught. Two strimeros, those are they which hoise up the maine yard by a wheele, and let it down againe with a wheele as need is, have each man one millreyes the month and 28 fraught: Thirty three saylers have each man one millreyes the month, and 28 fraught; 37 rowers, have each man 6 millreyes the moneth, and 18 millreyes fraught: four pagiens which are boyes, have with their fraught 4 millreyes the month; one master gunner, and eight under him, have each man a different pay, some more, some lesse.

The surgion likewise hath no certaine pay: the factor and purser have no pay but only their chambers, that is below under hatches, a chamber of twentie pipes, for each man ten pipes, and above hatches each man his cabbin to sleep in whereof they make great profit.

These are all the officers and other persons which sayle in the ship, which have for their portion every day in victuals, each man a like, as well the greatest as the least, a pound and three quarters of bisket, half a can of wine, a can of water, an avroba which is 32 pound of salt flesh the moneth, some dryed fish, onyons and garlicke are eaten in the beginning of the voyage, as being of small valew, other provisions, as suger, honny, reasons, prunes, ryse, and such like, are kept for those which are sicke: yet they have but little thereof, for that the officers keepe it for themselves, and spend it at their pleasures, not letting much goe out of their fingers: as for the dressing of their meate, wood, pots, and pans, every man must make his owne provi-

sion: besides all this there is a clarke and steward for the kings souldiers that have their parts by themselves, as the saylers have.

This is the order and manner of theyr voyage when they sayle unto the Indies, but when they returne againe, they have no more but each man a portion of bisket and water untill they come to the Cape de Bona Esperance, and from thence home they must make their own provisions. The souldiers that are passengers, have nothing els but free passage, that is roome for a chest under hatches, and a place for their bed in the orloope, and may not come away without the Vice Roves passeport, and yet they must have beene five yeres souldiers in the Indies before they can have licence, but the slaves must pay fraught for their bodies, and custome to the king, as in our voyage home againe we will at large declare.

(To be continued.)

[1] Texel. [2] Now the Rock of Lisbon. [3] The Millrey is an imaginary coin.

The Convent of La Rabida,—*An Historical Picture.*—*By M. G. de la Landelle.*

(Concluded from page 151.)

Nothing tends more to tire out benefactors than unfruitful attempts to achieve an object. Those of Columbus in following the Court were most wearisome. The councils of Salamanca and the courts of inquiry afterwards all seemed forgotten by the elite of Spain. But this was far from being the case in the distant monastery of Palos.

There the memory of Columbus remained fresh in every heart; there his son, reared by the Franciscan monks, became their brother and common friend. In the seclusion of its silent cloisters the anniversary of the day on which the poor shipwrecked navigator had first knocked at its door, was looked for as that on which a great event had occurred. His design concerned the whole world. His exemplary conduct before the army was the theme of admiration. There were rejoicings there when his letters gave any hopes of success, and there were unmistakeable signs of sorrow when new obstacles arrested his progress.

Nearly every evening the doctor Garcia Fernandez, at the end of one of his neighbouring excursions, came in to chat with his friend the prior, Juan Perez, and often at those visits talked over and over again of the planisphere which he had drawn on the massive oak table.

The letters of Marco Paulo were read and commented on in the point of view in which Columbus had considered them. Diego, who was present at these discussions, listened to them with attentive astonishment. He was a serious and religious youth, whose earlier years

had been passed in a distant colony beyond the sea, and whose childhood had been in the midst of cloisters. Beyond those walls life to him resembled an epic poem made up of battles and perilous navigation. Within the monastery it was holy but austere; but the appearance of religion and virtue was all that he could see. His intelligent mind soon developed itself, and gave abundant promise of his being the worthy son of Christopher Columbus.

At their daily prayer he pronounced the name of his father. Every day he ardently desired the execution of his father's projects, and it is easy to imagine the earnest attention with which he would listen to intelligence from Cordova, from Salamanca, from Seville, from Medina, from every place in fact where the persevering old mariner had solicited attention.

Diego was about seventeen years of age and fully capable of estimating the important object of his father when Juan Perez received a letter from him full of hope. He was treating then with the Duke de Medina-Cœli, who seemed disposed to entrust him with a ship for his voyage of discovery. Judging from the joyful feelings which pervaded every one around him, it might have been safely concluded that they all had a direct interest in the success of the enterprise. The conversion of the Khan of Tartary and his infidel subjects was the theme of their conversation when Christopher Columbus himself was announced as having just entered the convent.

Juan Perez hastened to meet him and present him with his son. The old man clasped him in his arms, but alas he had brought with him only bad news. After having been absent so many long years of reverses, he had returned to the convent of La Rabida as he had left it, poor, destitute of resources, and without the shadow of hope from Spain.

What, señor, the Duke de Medina-Cœli has he repulsed you also? said the prior, you surely have not made him thoroughly understand your object.

Yes, replied Columbus, he is as convinced as I am, but he is afraid of affronting the Court; he considers the enterprise too great for a subject, and he confined himself to a promise of his support after the King and Queen.

There is hope then yet, exclaimed Juan Perez.

No, no, padre, I have already lost too much time in Spain; I am already in my fifty-fifth year, and have already lost eighteen years in vain solicitations, no less in Portugal than in Castile. France perhaps will treat me better. I shall go to France.

At these words the prior was evidently disconcerted.

Stop, he said, you like Spain I know; you have a young family at Cordova, a wife and another son look to you there. Make no vain attempts at another Court to meet with refusal, rather abandon your project.

No, said Columbus, never! Spain has repulsed me. I shall go to France. I will search Europe over until I find a sovereign or some nobleman who will assist me. True my affections are at Cordova,

and I desire to leave there my son Diego, and there I will return after my voyage. But I repeat to you that it is more than time that I should go and find a sovereign more alive to his own glory and more anxious for the diffusion of our holy religion.

Isabella does not know of your project, said the prior, thoughtfully. And you, my good friend, do not know Isabella if you think to find in Christendom a prince more worthy to become your patron.

The arrival of Garcia Fernandez interrupted the conversation, and Columbus repeated to him the story of his ill success.

The old doctor, no less jealous of his country's honour than the superior of La Rabida, united with him in dissuading Columbus from offering his services to another.

If no one, he added, but Ferdinand was there, I should not think of insisting on your staying, but Isabella is on the throne of Castile. She has a noble mind and a warm heart. If she were really informed of the importance of your project, depend on it she would take it up, and you might have a fleet if you asked for one.

Columbus shook his head doubtfully, and addressing Diego said:—

To-morrow morning, my son, be ready to follow me. We must leave our peaceful retreat, we must part from our kind protectors and bid them farewell.

The eyes of the youth were fixed on Juan Perez, filled with sorrow, when he suddenly exclaimed.

No, no, my son, you must not go yet. I beg of you, Senor Columbus to give me some days yet. I will write to the Queen, and if necessary I myself will go to her and interest her in your favour.

God grant that your prayer may be heard, said the old mariner, and his will be done.

The prior, full of enthusiasm, and in fear of seeing Isabella deprived of the glory of a noble enterprise, wrote to her at the moment a clear and energetic letter.

Garcia proposed that it should be sent by a pilot who was well known for his cleverness and being devoted to his interests.

This proposal was no sooner accepted than put in execution, and Columbus waited at the convent for the answer. It was not long in coming. Fourteen days after the departure of the messenger, Juan Perez was summoned to Court, and was desired to tell Columbus not to despair.

On the reception of this royal despatch great were the rejoicings in the convent, and thanks were given to God for the success of the prior. Although it was near midnight, such was the zeal of Juan Perez that he would immediately commence his journey. His mule was saddled, and he set out, accompanied by two servants well armed. Columbus, Diego, Garcia Fernandez, and all the Franciscan monks assembled in the court-yard of the convent to witness the departure of the prior and bestow on him their blessings.

But Columbus, who was interested more than any one else in the success of the prior, was not without his doubts. He had often depended in vain on the promises of men in power; full often had he be-

lieved that all obstacles were removed. But deeply penetrated with gratitude towards the prior, he resigned himself to Heaven and calmly awaited the result.

This is no more perhaps than a new trial, he thought,—for being thoroughly convinced of the magnificence of his design, he believed that his claim was rendered stronger by adversity. He rejoiced inwardly in the thought that the most humble instruments were the most acceptable to God, and he said to himself, at the place when the Pope's Nuncio failed, and also the third king of Spain, there will the humble friend of Juan Perez succeed. Occasionally, when he contemplated in his mind the extensive coasts of the wonderful empire of the Khan, when he contemplated the ships under his command as having crossed the ocean and approached the shores described by Marco Polo, he became lost in a pious reverie. Christopher Columbus presented, in fact, a remarkable combination. His was a mind which united a speculative enthusiastic imagination along with mathematical precision, in which was predominant religious belief. He had comprehended the whole question at a glance, and would *Dieu le veut.* And it was an unchangeable confidence in the certainty of the Divine will, which had supported him through twenty years of reverses, refusals, and humiliations, and which eventually after being successful enabled him to add to his spirited and noble character and dignity of person that true modesty of which so few examples are found.

He attributed to God alone his desire for discovery, and if he was ungrateful to man he was ever an instance of humility of mind as a true Christian should be. The history of the great navigator presents in every page a mind well stored with resources.

Juan Perez, whose name was well established in estimation at Court, hastened there with confidence. He crossed the country recently conquered from the Moors, and made such good progress that he arrived there in four days, where he found Isabella. During the siege, the Spanish camp having been burnt, was replaced by a fortress. In order to invest more effectually the Mussulmans' capital, the Christians had erected under its walls a city peopled by an army, and had made it the seat of government. Such was Santa Fe, which thus owed its existence to the memorable contest between Islamism and Catholic Spain. War, which annihilates cities, this time added one to the world.

Juan Perez found the Queen well disposed already towards Columbus, owing to the reports of the Duke de Medina-Cœli. He spoke in warm terms from his own convictions of the plans of Columbus, and interested every one in his favour, among whom were the principal persons at Court.

Isabella desired to see him, and learning his want of means, sent him by the prior 20,000 maravedis, to enable him to appear at Court.

Garcia Fernandez received this sum at Palos, and transmitted it to Columbus, who fitted himself out with it, and full of new hopes set out on his journey to Santa Fe to join his generous friend Juan Perez.

We shall not attempt to describe the effect in the convent of these new favours towards Columbus. Diego accompanied his father to Seville,—the doctor attended them also, and when the hour of departure came, promised to take an active part in forwarding the preparations for the expedition, of which many pilots and inhabitants of Palos had already heard mention. Thus no one doubted that Columbus would succeed in obtaining the object of his wishes. The evasive promise which he received only a few months previously acquired then a real importance; for the report that had got abroad in Grenada began to assume the appearance of probability.

Although he had been so recently deceived, the great navigator could only entertain vague ideas, while he had reason to despair of help from Spain and himself break off negociations at apparently the most favourable moment.

When Columbus arrived at the Vega of Grenada an extraordinary spectacle was presented to him. The Christian army marched out of Santa Fe in battle array, an extraordinary multitude of people of all nations, Spaniards and Mussulmans were collected to behold them. In fact, one of those spectacles was passing which seldom occur in any country.

The voyager hastened the pace of his mule, and entered the fortified part, where the Prior of La Rabida was impatiently awaiting him.

The victorious army took up its position in the plain. A brilliant cortege sallied forth from Santa Fe. Ferdinand and Isabella, attended by their Court and the most renowned captains of the Spanish army as well as the Spanish clergy, bent their steps towards Grenada, which threw open her gates to receive them. At which loud acclamations and shouts of triumph rent the air, and were followed by songs of peace. After a strife of eight centuries, the cross had triumphed over the crescent.

The Mussulmans of La Vega, dispirited and silent, remained collected in their heights, from whence they assisted in the downfall of their empire. Those of Grenada remained shut up within its walls, while the army was replenished with various chevaliers of all nations, all filled with ardour and joyous, all enthusiastic in the glorious conquest which Castile and Arragon had achieved for Christian Europe.

Amidst this crowd of persons were seen a Franciscan monk and an obscure individual, wrapped up in ideas not suggested by what was going on before them. Christopher Columbus and Juan Perez were engaged in discussing the projected discoveries.

In a few days, my friend, said the prior, the kingdom of Grenada will be quietly settled under the government, and the Queen will see you on the subject of the voyage.

It was not without some feeling of bitterness that the old seaman replied;—

When I see, he said, the fuss that is made of the conquest of a ruined province and the indifference with which a proposal is received which would give to Christianity a boundless empire, I cannot help

pitying the short sightedness of man. It is a fine thing to expel the Moors from Europe, but how much more grand it would be to carry the light of Christianity to a new people at the ends of the globe, to extend the limits of the known world, and to give to Catholic Castile more infidel kingdoms, of which this country so hardly subdued would form but a small fraction. I look with indifference on this day's events, so much must they be short of my desires,—after being repulsed for six years, treated as an adventurer and intriguer. If I were not supported by my confidence in God, if I did not believe that his holy will would not permit the realization of my hopes, if I did not look on the reduction of Grenada as one of the means of Providence, I should look with disdain on all these pompous rejoicings.

As he said this, Columbus and Juan Perez arrived, with the royal cortege, at the foot of the Alhambra.

The clamours of the multitude, followed by an interval of silence, attracted their attention. The iron gates of the splendid palace of the Moorish kings were thrown open. The next moment the last of Boabdil was seen with his attendants issuing forth,—he advanced towards the King and Queen, bowed before them, and delivered up the keys of the opulent fortress of Grenada, of that sacred retreat, the chef d'œuvre of oriental architecture, which he abandoned now for ever.

The next moment the Spanish standard floated from the highest tower of the Alhambra.

Such was the end of Mahometan power in the Peninsula, and the hour was arrived when Columbus could claim to be heard. Juan Perez having made him known at Court, and seeing that obstacles were smoothed down before him, withdrew quietly to the convent of La Rabida.

The monarchs of Castile and Arragon at once listened without delay to the proposals of Columbus. A council was held to consider them and to discuss the proposals of the illustrious navigator. But influenced by the magnitude of the enterprise, Columbus, who had expended eighteen years of his life in useless applications, demanded conditions of a truly high character. He desired first of all to be made admiral and viceroy of the countries which he should discover, and to have a tenth part of their value. Columbus, in fact, had determined to employ, as he then imagined, the riches which he expected to amass in the deliverance of the Holy Sepulchre. He intended to raise an army of 50,000 men, according to a memoir which he presented eight years afterwards to the Spanish Court, on his return from his third voyage of discovery.

He had scarcely mentioned the terms on which he proposed to make his discoveries, than the courtiers about him began to make sarcastic remarks. It was talked of everywhere that he was but a clever intriguer, who demanded a large reward without having done anything for it; an adventurer, whose crude proposals would involve the Court in enormous and useless expences; and the Queen yielded to the expression of this feeling without even giving Columbus an

interview. Attempts were made to obtain concessions from the old mariner; but with a determined spirit, which proved the immoveable determination by which he was guided and the firmness of his character, he declared he had done enough for the kingdom of Spain.

Resolved on leaving Spain immediately, he hastened to take leave of his friends, among whom was Alonzo de Quintanilla, Comptroller General of Finance, and Luiz de St. Angel, Receiver of Ecclesiastic Revenues of Arragon, who gave him a letter for the Prior of La Rabida, and he left Santa Fe determined to try his fortune with Charles VIII. of France.

Quintanilla and St. Angel had been instilled with a good opinion of Columbus by the venerable Juan Perez, and entertained as much respect for the old navigator as he did, and during the time that he was with the army before Grenada they had entertained a favourable opinion of his plans. And seeing that Columbus was forsaking the country, they resolved on one desperate attempt in his favour. Their offices gave them access to the Queen, and they determined on availing themselves of their station, and stated that an affair which affected the honour of the country influenced their proceedings.

Meanwhile Columbus, with grief and disappointment, was directing his steps towards Cordova, considering how he should proceed in urging the subject on the Court of France, speculating in his mind as to his chance of success with Queen Anne of Britain, and his lost time at the Court of Isabel of Castile.

At this moment Luiz de St. Angel was pleading his cause with evidently increasing hope.

Your Majesty, he said, will deign to pardon me for calling your attention to a subject which has escaped it; but as a loyal servant of the crown I consider it my duty not to allow an opportunity to be lost of forwarding the sacred cause of Christianity; blinded by the enemies of a man of genius without friends, your Majesty—(the purity of my intentions will excuse my boldness—) still may desire to patronize his plan and to interest yourself in his well known designs. St. Angel, transported with his subject, admitted he might be led away by its importance, and Isabel did not venture to interrupt him.

Christopher Columbus is leaving Spain, he continued; your Council has rejected his proposals; he is going to France, and will offer his services to your rival. Suffer me, I entreat your Majesty, to stop him with a message worthy of you; permit me to express my astonishment at seeing your gracious Majesty, always favourable to a grand enterprise, refuse your concurrence to a man who has shown his value in the last war. Columbus is a clever astronomer, a learned cosmographer, all your officers have been compelled to acknowledge this: his acquirements in navigation are incontestible, and no one can deny that he is a brave and prudent commander. It was but lately that his plan was all but adopted, and for some trifling difficulty, when he was as it were at the summit of his hopes, he was repulsed, he was outraged, and forced to abandon Spain, to whose glory he would have contributed.

Quintanilla in his turn begged permission to observe that Portugal had extended her discoveries along the African coast, Christendom had resounded with her success, and while the galleys of Castile and Arragon remained shut up in the Mediterranean, her caravels never went beyond the Canaries,—a neighbouring contemptible people were boasting of their successes at sea while they had lost the only means of going beyond them.

The attempt of Columbus, added St. Angel, would reflect honour on your crown even if it achieved no more than to clear up a doubt which interests the whole world.

To all this Isabella listened with deep attention.

The energetic words of the friends of Columbus made an impression in respect of the real magnitude of his undertaking,—and Isabel foresaw for the first time the advantages which Christianity would derive from his discoveries. Quintanilla and St. Angel urged the consideration of the disappointment she would feel if they fell to the lot of any other power. He dwelt much on the little which Columbus had required,—two ships and about 300,000 crowns. After having entered into long arguments favourable to their protegé, the two ministers maintained a profound silence.

A lady of the Court, the Marchioness de la Moya, who happened to be near the Queen, pleaded also the cause of Columbus. Isabel still remained undecided. She knew that the war had drained the finances of the government, and that the King had ceased to entertain all projects of discovery of any kind.

Alonzo de Quintanilla, St. Angel, and the Marchioness de la Moya, looked with supplicating eyes at the Queen, who still remained as if reflecting on the importance of the conversation, at length convinced by her own good judgment, broke the silence by exclaiming with enthusiasm,—I will take on myself the charge of the enterprise for the crown of Castile, and will guarantee its expences with the value of my jewels. Some historian has said that this was the finest trait in the character in the life of Isabel: it allied her name for ever with the glory of having encouraged the discovery of the New World.

Luis de St. Angel undertook to provide the necessary funds from the revenues of Arragon, and a courier was despatched to recall Columbus, who was already some leagues from Grenada, on the bridge of Pinos, celebrated for the numerous battles between the Moors and the Christians. The cause of science was gained,—the Queen renewed her promise to the old seaman himself, and advocated his cause with Ferdinand.

In presence of the sovereigns of Castile and Arragon, certain then of success, Columbus expressed himself on the subject of his scheme with a confidence which gave him a convincing eloquence, and concluded a pompous account of the success which he was certain of obtaining, with the statement that he intended to consecrate all the riches he should obtain from his discoveries to the rescue of the Holy Sepulchre.

This peroration had little effect on Ferdinand and Isabella, and rather produced a smile of misgiving, and replied, that even without the treasures of the Indies it was their intention to attempt this holy conquest as soon as finances enabled them to do so. These august sovereigns conferred special privileges on Columbus, who forgetting his tedious delays, declared that he would do all in his power to evince his gratitude. Isabel, with that generous forethought and consideration for which she was celebrated, sent the Admiral a letter in which she nominated his son Diego a page to the young prince, the heir apparent to the throne.

Few days elapsed before Columbus returned to the convent of La Rabida. The Franciscan friars, who had long been waiting with hopes and fears for his success, listened to the recital of his proceedings with profound attention. Although they knew that he had gained the object of his most sanguine hopes, they were yet fearful for him, and deeply interested by the narrative of his departure from Santa Fe for Cordova, which drew the exclamation from Juan Perez: Why, senor, you have already sailed. You are certain of success. When Columbus sent to his son the order to appear at Court, blessings unnumbered were bestowed on Isabella of Castile.

Garcia Fernandez, the Pinzons brothers, and all the principal people of Palos, soon repaired to the convent, where the illustrious navigator planned out the details of his enterprise. Some months passed away before they were completed. The seamen of the place, terrified by the nature of it, refused to accompany him, and Columbus had well nigh seen his enterprise fail from this difficulty alone. But at length, on Friday the 3rd of August, 1492, three small vessels were ready on the waters of the Tinto, and the Admiral's flag was displayed at the stern of the only one of them which was decked. The two others, the *Niña* and the *Pinto*, were commanded by the brothers Martin Alonzo Pinzon and Vicente Pinzon.

At early dawn the inhabitants of Palos, assembled on the shore, witnessed the visit of the Franciscan monks of the convent of La Rabida to the *Santa Maria*, gaily decked out with flags of the most brilliant colours. An altar was soon prepared on board the caravel, at which Juan Perez officiated, and Christopher Columbus, his officers, and men, were there solemnly blessed by the venerable prior. The protection of God and the holy Virgin was invoked for the little vessels, and thus the most important ceremonies were performed previous to their departure.

Columbus confided the care of his son Diego to a priest of Palos, who undertook to give him some knowledge of the world previously to sending him to Court. He then took leave of Garcia Fernandez and the prior, with a grateful heart for the part he had taken in his success. And at length, when his son and all his friends had landed, and when the Pinzons with their crews had returned to their respective vessels, the *Niña* and *Pinta*, he gave the signal for departing, and the little squadron sailed half an hour before sunrise.

As the pilots conducted the ships down the river of Palos, Christopher Columbus, with eyes fixed on the monastery, which he knew contained his best friends, besought a blessing from Heaven on his enterprise. The promontory of La Rabida became gradually concealed by other high lands, which in their turn became lost to view as the three frail vessels shaped their course over the broad ocean for the Canary Islands, from whence it was the intention of Columbus to steer due West across an unknown sea.

Many years after, when persons of high condition boasted at the Court of Castile of having assisted Columbus in his design, he did not forget the zealous Quintanilla and St. Angel; but he related how he had found at the convent of La Rabida more encouragement and consolation than in all the rest of Spain itself.

The name of the monk Juan Perez de Marchela and his veteran friend Garcia Fernandez, the doctor of Palos, are closely linked with the discovery of America. It happened that shipwreck cast away, poor and in want, on a foreign shore, him who was destined to accomplish the designs of Providence. A humble monk, who had forsaken the vanities of the world for holy solitude, became the true friend of the hero. It is thus that Providence chooses the instruments of his designs from among the most humble of his servants.

G. DE LA LANDELLE.

[The foregoing paper and those preceding it in former numbers complete another of the various accounts of Columbus previous to his first voyage. The present, however, may be considered but an outline in comparison with that which accompanies the *Landfall of Columbus*, published a year or two ago. This was not only a far more complete account of the old mariner, but, after he sailed from Palos, informed the world for the first time where he went to, the island he first saw and landed on, and those which he successively discovered until he reached Cuba,—containing, in fact, the first true account of the whole of his first voyage.—ED. *N. M.*]

MACULLAH AND THE CURIA MURIA ISLANDS.

Macullah.

Macullah is the principal commercial depot on the coast of Arabia. This town is constructed on a narrow rocky point projecting about half a mile into the sea, with a bay on each side of it. The Nakib's house, in lat. 14° 30′ 40″ N., long. 49° 12′ 20″, is situated almost directly beneath a curious and remarkable oblong hill, the circular top of which rises above the summit of a steep cliff commanding a complete view of the town, and on which six square towers have been erected for its protection.

The foundation of this singular height, usually called Macullah Hill, is of limestone; and the upper half a beautiful white marble, traversed by grey and blue veins. Its surface has a light sandy tinge, and can be seen from the distance of forty-two miles.

To the North and West of the largest, or the Nakib's, house the place is strewn with cadjan huts and stone buildings, erected within the last two or three years. These are built on a sloping ground from the base of the cliffs. From the westward of these to the water's edge a dilapidated wall extends, having but one entrance gate, which is constantly guarded by a few Bedouins. The principal portion of the Macullians dwell here, amounting, perhaps, to four or five thousand souls, forming a motley collection of the Beni Hassan and Yafa-i tribe, Karachies, and Banians, intermixed with foreigners from all parts of the world.

The custom duties are five per cent upon Indian produce, or other goods from India and Cutch. Vessels are charged anchorage fees of five, ten, and fifteen dollars, according to size; but Arabs will scarcely ever submit to the demand, considering themselves exempted from such taxes in the Red Sea and in those harbours which confine its limits. The opinion they maintain is this,—"Are we not all Ben-i-Adam (Sons of Adam), and have we not equal rights in the kingdom he bequeathed us?" Thus do they avoid any contribution towards conveniences by which they profit, unless actually constrained to do so.

Slavery is considered so universal a benefit that the duties levied on the sales of males and females are very trifling; consequently, great numbers are imported and sold upon inspection. A market for the latter purpose is daily kept up, where a person may see hundreds of these wretched creatures linked together; and when thus exhibited the highest bidder first surveys the lot knocked down to him, and, if satisfied with his bargain, drives away the miserable slaves, either choosing the females for his harem or any other occupation. But if, however, the lady does not precisely answer his object, whatever it may be, she is returned to the sale for another chance, and a per centage deducted from the price originally paid, owing to her disqualification.

The Mahomedan religion is strictly observed here; but of course the native population becoming daily so mixed up with visitors and strangers, even the awful rigour of the law fails to prevent the constant scenes of riot and debauchery that occur.

The Banians possess overwhelming influence in trade of all descriptions,—superintending, purchasing, and monopolising the cargoes of vessels, &c., which they afterwards sell to other castes at so much per candy, and so on, according to the speculated articles.

A ship in want of supplies will find Macullah the very best port on the coast for the purpose of renewing her stock. Persons should be careful to send their own casks on shore for water, as otherwise the people are likely to bring it quite of a brackish taste. It is conveyed to the vessel in skins, which women and donkeys are employed to fill and transport from a well nearly two miles to the West of the town.

Yet, notwithstanding the trouble of obtaining it, they do not render it expensive.

The Bay of Macullah may be said to extend to Ras Macullah. Owing to the coast between the promontory in which the town is situated projecting from the centre of the large bay just mentioned, causes each side to form a lesser one, the western of which is the general anchorage for boats. This is merely a small nook, with one, two, and three fathoms, having Macullah to the eastward and a reef to the westward (nearly dry at low water springs), extending from the shore in a S.S.W. direction to the round point. It bears from the Sheik's house, or flagstaff, S. 73° W. The eastern small bay is seldom or never used, owing to a swell which rolls in with considerable violence during the N.E. monsoon causing a surf on the beach. The bank of anchoring soundings round the Bay of Macullah extends for about half a mile from the shore, until off the low sandy beach running towards Towa, when it increases to nearly one mile.

The great Bay of Macullah (in which are the two smaller ones, known as the eastern and western) is sometimes affected by a swell rolling in, when the wind blows strong outside; but, generally speaking, the breeze falls off towards night and the swell goes down. A vessel can lie here with perfect security during the N.E. monsoon; yet, although it is reported to be the best anchorage for that season, I should unquestionably advise the harbours of Sharma and Aden in preference, as the latter are both considerably smoother. Macullah Bay is nevertheless chosen for the convenience of being nearer the port, from whence supplies of every kind may be readily procured, and more frequent opportunities occur of communication with India, &c.

The weather in this bay is exceedingly warm during the middle of the day, and on shore intolerable. Occasionally, however, land and sea breezes, with slight showers, seem to pour a refreshing influence over the scene in the months of October, November, March, and April, and often in June and July. I believe the town is not considered unhealthy for invalids. From my own experience, I should unhesitatingly pronounce the climate to be injurious to Europeans, any detention being invariably followed by intermittent fever among the officers and crew; and, to make this more apparent, a cruise immediately produced a beautiful change throughout the vessel.

The natives informed me that in the S.W. monsoon the wind blows home with very great force; but always as the sun declines the breeze and swell decrease, and that often during the morning it blows strong enough from the N.W. to carry a ship clear out to sea. They tell me also that a vessel with chain cables might ride the monsoon out with safety in the bay; and I think it must certainly be true, otherwise (judging by comparison), one half of Macullah town would very soon be demolished, as the houses are for the most part erected in a careless and slatternly style, on a projection which necessarily receives the whole benefit of the S.W. winds, and their inevitable fate must be a general sweep into the waters beneath them, whereas they still quietly retain their separate stations.

Jeizrat Kibliyah.

Jeizrat Kibliyah, the eastern island and third largest of the Curia Muria group, is nearly two miles long, one and a half broad, and five in circumference, forming in all views several peaks, which are composed of primitive limestone, more or less allied to granite. It is rocky all round, with the exception of a sandy nook to the eastward of the N.W. point, in which we were able to secure our boats.

The highest peak is 550 feet above the sea, in lat. 17° 29′ 16″ N. and long. 56° 24′ 22″ E. It is a mere barren rock, visited by a few birds of the gannet species. Its other occupants are everything almost that is disagreeable to man, and they thrive well,—snakes, rats, mice, scorpions, and centipedes innumerable.

We found some graves, and also some skeletons exposed in positions as if the poor creatures had perished from starvation. This supposition was partly confirmed afterwards by the inhabitants of Hullaniyah Island informing me that a ship and a bugala had been wrecked there; and that in consequence of their not being able to render them any assistance, owing to their having no boats, the crews miserably perished.

Jezarat Hullnaiyah.

Jezarat Hullnaiyah is the largest of the Curia Muria Islands, being 7¾ miles long by 4½ broad, and nearly 20 nautical miles in circumference. It is composed almost entirely of different coloured granite and limestone; is mountainous and entirely barren. Indeed, on its western side scarcely a bush was perceptible, but on its eastern face we found a few wild flowers and a little grass, which served as subsistence for thirty or forty wild goats. Wood is a scarce article, the largest and, in fact, only tree being the tamarisk. We found three wells of indifferent water, and a fourth for our own consumption, which the inhabitants immediately designated as the "Bir Inkiliz."

The eastern and western ends of Hullaniyah terminate in comparatively low points, whilst the centre is filled up with close ranges of granite mountains, the highest part of which is 1,503 feet above the level of the sea, forming a cluster of chimney peaks closely united. The N.E. end forms a majestic bluff of 1,645 feet in height, being the most lofty part of the island. This bluff forms the N.W. point of the N.E. bay, called Gubbet-er-Rahib. It is steep to, and there are twelve and thirteen fathoms close to the rocks.

Hullaniyah is the only island of the group that is inhabited. Its population in 1835 consisted in all of twenty-three souls.

I found the poor people inoffensive and civil. The men were of small stature, the women stout and all very plain. They calculated upon one death annually, which did not happen in 1835; whilst one birth was daily expected, and did occur before we left the islands, which gave an increase of one male. This, however, is not likely to continue, as the women are considerably past the bloom of youth. They have no idea from what part of the coast they originally came,

or whether they belong to the Lenabi or Gharrah tribes. It is most probable that they belong to the latter, and that they originally came from Hasek. They profess Mahommedanism, but they are not very scrupulous observers of the tenets of their creed. Indeed, we saw but one who knew his prayers. Their huts are of loose stones, either square or circular, about five feet in height, covered with seaweed. They change their habitations with the seasons, as the surf on the weather side is unfavourable to their fishing from the rocks. They have no boats or catamarans, though their daily subsistence depends chiefly, if not entirely, upon their baskets and fishing-hooks. When unsuccessful in fish, which is seldom the case, as they are abundant, crabs and shell fish serve them for food.

Besides the heavy craft that occasionally touch here, the island is sometimes visited by a boat belonging to the "Kalifan" family, of the Mahrah tribe, who claim the Curia Muria group as their hereditary property. Their residence is at Ghazir, and their periodical visit to the islands is for the purpose of claiming any ambergris that the inhabitants may have collected, as well as to obtain a large portion of whatever money they may have received in exchange for their fish. In return, they are frequently rewarded with a little tobacco, dates, and coarse cloths, the liberality of the donors generally being limited by the amount of tribute they may have succeeded in exacting.

Ghubet er Rahib.

Ghubet er Rahib, or the large bay forming the N.E. side of Hullaniyah, is $3\frac{3}{4}$ miles from point to point and $1\frac{1}{2}$ mile deep. Its N.W. point is the highest part of the island, forming a bluff, as before mentioned. Its S.E. point is Ras Sair. Shelter might be found in it from south-easterly, southerly, and south-westerly winds; and a vessel might obtain fresh water by anchoring in ten or twelve fathoms, about 800 yards off shore, with the extremes of the bay from N. 35° W. to S. 65° E., true, abreast of a small nook with a sandy beach, which may be known by a small peak that forms its eastern side. This nook is situated one mile to the westward of the East end of the long sandy beach in the centre of the bay. The well is at a distance of 400 yards, in the centre of the valley, turning to the westward, and is the best built well on the island.

Ras el Hadd.

Ras el Hadd, the N.E. point of Arabia, is a low sandy point in lat. 22° 23′ 30″ N. and long. 60° 0′ 0″ E., having a spit off it nearly 300 yards. From this point the land suddenly turns in a W.N.W. direction towards Khor Jaramah. When off Ras el Hadd, a fort, with a village and some trees, will be seen near the pitch of the cape, called by the natives Gharkah.

From the low sandy cape, in a N.W.b.W. direction, rocky cliffs and points extend until you open Hajarah Bay, which is three miles from the cape. The points at the entrance are rocky, but with deep water in the channel, and anchorage ground in from ten to twenty fathoms

outside. The upper part of the bay, which almost joins the village of Gharkah, is shallow.

From Hajarah Bay the coast continues in a north-westerly direction as far as the entrance to the fine inlet of Khor Jeramah, at the entrance of which a vessel may anchor in eight or nine fathoms, or proceed at once up to the creek, carrying six and seven fathoms; but she must keep on the left hand side, as a shoal with two or three fathoms on it exists on the right hand side of the channel, about a quarter of a mile from the entrance.

The creek is four miles deep, but narrow at the commencement for a mile and until you open out an island, on each side of which there is a clear channel,—the western one having three, four, and five fathoms, and that to the eastward six and seven. From this island the creek opens out to two miles in width, and becomes shallow at the upper part on the South side, the shore of which is low marshy ground, covered with wood.

On the Winds and Weather likely to be experienced within the Gulf of Aden along the line of the Arabian Coast to Ras el Had.

December, January, February, and fifteen days of March.—During these months the N.E. monsoon blows along the line of coast, changing according to the inflection of the land; whilst at a distance from the land it blows from N.E. to E.b.S., with clear pleasant weather, free from squalls and rain.

This description will answer for every part of the coast above alluded to, with the exception of that part between Ras Seger and Ras Karwau, and more especially with the exception of the extensive bay of Curia Muria, which is entirely different from other parts of the coast.*

During the tedious, trying time that I was employed in making a trigonometrical survey of this bay, the sudden changes of the winds, and the great violence with which they blow, rendered the position of the surveying vessel I commanded frequently dangerous, and she was only extricated by the activity of the officers and crew, and her good supply of ground tackle,—four chains of 125 fathoms each, and six anchors on board.

It is also necessary to observe that these changes give no warning. Owing to which I was compelled, for the safety of the vessel, to secure her thirty miles from the islands, while I surveyed them in my boats. And it was not an uncommon occurrence for boats to be manned and ready when, from a clear serene sky, a light arched cloud would appear over the table cliffs surrounding the bay, and in five minutes (just time to run the boats up) we could not see ten yards from us, and it blew a perfect gale from the northward. These winds are termed by the Arabs *Balat*, or *Belat*, and are much dreaded.

* For a synopsis of the weather experienced off the Curia Muria Islands in 1835 and 1836 see *Nautical Magazine* for 1857, page 387.

But what surprised me more than these land winds were the frequent and heavy gales from S.S.W. during February and March, blowing six days together. In one of these, towards the close of the survey of the island, I was surprised when sounding round the bay on a dead lee shore, having parted two bowers. My night orders were to run the staysail up if she parted, and steer for the sandy beach on the N.W. side of the bay, the only way to save the crew, as the vessel would never work to windward in blowing weather.

In concluding this subject, I would observe that the experience of years along this coast has taught me that implicit confidence cannot be placed on the regularity of the seasons, as I have frequently during the same month in different years experienced exactly opposite winds. In March, 1835, I was twenty days from the Curia Muria Islands to Macullah, with southerly and westerly winds and contrary currents; and in March, 1836, I was only three days, having the N.E. monsoon with me.

Further, I have observed that at all seasons and in all parts of the coast of Arabia, particularly when the land is low, the wind is influenced more or less by the sun's position, and, according to the rarity of the atmosphere, changes towards the sea; and even in strong breezes the same influence obtains to a certain degree.

THE PROPOSED SUEZ CANAL *Considered in Reference to the Influence of the Nile. From "An Investigation" of the subject by Captain Spratt, R.N., C.B.*

The effect of the prevailing wave on the coast drift of matter discharged from the Nile's embouchures is undoubtedly a point of much importance in the consideration of the practicability of maintaining a harbour in Pelusium Bay. And considering that as the prevailing winds, and therefore the prevailing wave movement and currents on the coast of Egypt, are from the N.W. and westward, the small extension of the shores of the delta to seaward would be accounted for. But to the westward of this river, and so near to it as Alexandria, the influence would be probably nothing; and that even directly off the coast its influence would probably be found to extend but for a few miles only.

With this view I commenced an examination of the shore and soundings at different depths off the whole Egyptian coast; and then compared their result with those obtained from the banks of the Nile at different parts, from the shallows of its bed in the middle of the delta, and also from those found at its angle near Cairo; as places affording true indications of the matter which the river annually transports and deposits in the sea.

The recent communications of Mr. Horner, published in the *Phi-*

losophical Transactions, part 1, 1855, have shown that the Nile's deposit, whether the black soil of the upper surface or the grosser matter of sand deposited in its bed and banks, contains a very large proportion of silicious, and but a small portion of calcareous matter; the quartzose or silicious particles being from 55 to 80 and 90 per cent., and the latter only 5 or 6 per cent.

Indeed the whole sand deposited is, I find, quartzose sand, intermixed with some fine mud and particles of mica.

And it is well known that the sands peculiar to the Egyptian desert are also quartzose; and that the upper crest of the hills which embrace the Nile's valley is composed of quartzose rocks and quartzose sand, that must annually contribute this mineral to the Nile in a large amount.

The Nile evidently transports a large quantity of this sand amongst its deposits; for below the Nile's low water level the bed seems to be almost pure sand in many parts; and even the islets formed by its deposits, and left exposed at low Nile, dry into a palpable sand in many places.

In sinking the tubes for the new railway bridge in course of construction across the Nile at Kafr Zeït, on the Rosetta branch, the matter penetrated through, to a depth of thirty feet below the bottom of the river, was found to be almost wholly quartzose sand, with but very little mud intermixed with it. The mud, also, which the river transports and deposits over the delta, although black and slimy, is, by the showing of Mr. Horner's analysis, more than 50 per cent. silicious.

Thus the preponderating mineral or sand which the Nile transports to the sea being identified, and capable of being tested by acid, it became evident that the Nile's debris along the coast could be easily traced, and thus the wave movement theory relative to its easterly dispersal might be fully tested.

But as the belt upon which Alexandria is situated is rock, extending from Arab Gulf, on the West of that town, to Aboukir Bay, and might also be silicious, indeed has been represented as identical with the sand stones of the desert, the testing of the nature of these rocks became therefore a point of inquiry previous to testing the sea bottom.

The rocky coast of Alexandria, instead of being quartzose, like the sand stones of Mount Mokattim over Cairo and of the elevated desert, consists of almost a pure calcareous sandstone, of agglutinated fragments of coral and shells, as found at certain depths off the coast at the present time; consequently a pure sea production of very recent geological time,—apparently post-tertiary. Fully 95 per cent. of the Alexandrian sandstone was soluble in diluted muriatic acid, and therefore calcareous; whilst the sand deposited by the Nile is insoluble in that acid.

This rock, therefore, having no identity with the deposits of the Nile, rendered the defining of the westerly limit of its influence easy. Because the present sea productions being calcareous and identical, the line of demarcation between two such characteristic minerals,

silex or lime, would identify their different sources of origin, viz., whether the matter was silicious and therefore came from the Nile,—or whether calcareous, and therefore derived from local or distant coast abrasions and sea organisms.

After a series of dredges in different depths and at different distances off the coast of Alexandria as far as Aboukir, by testing a portion of each, in all depths under 10 or 15 fathoms, the bottom was found to be mainly coral, or rock incrusted with coral, interspersed with patches of sand formed of their debris.

This littoral zone extends from half to one mile from the coast. Beyond it, into 20 fathoms, the bottom consists of the debris of the littoral zone of rock and coral, intermixed with numerous fragments of sea shells, and thus constituting a calcareous sand.

In the next zone of between 20 and 30 fathoms it was composed of a white marly sand resembling chalk,—both marl and sand being for the most part calcareous, almost deficient of silicious particles: the proportion being fully 95 per cent. calcareous and 5 per cent. insoluble matter.

Thus I ascertained that the Nile's deposits not only never reached so far to the westward as Alexandria, but not even so far as the site of Canopus or Aboukir, as a predominating quantity. That this region is wholly within the Nile's influence becomes visibly evident by the bottom having been entirely changed from a white calcareous sand and mud like chalk to dark brown silicious mud and sand (the pure Nile deposit) at about four miles N.E. of Aboukir Island, and twelve miles West of the Rosetta mouth. From thence to Rosetta it never changed, except in proportion of sand to mud, or mud to quartzose sand, ascertained by sifting a certain quantity of each dredge. Thus another important element connected with the Suez Canal question was elicited by finding that a portion of each dredging might be advanced with the movement upon any harbour or piers constructed transverse to it.

Thus was traced the extent of the Nile's influence along the coast in bringing to the sea an amount of sand which far exceeded my expectations and experience in respect to other rivers: that of the Danube being a very much less proportion of sand to mud,—the former being of the finest quality. The Nile sand, on the contrary, is much coarser, and forms sand banks off the coast of quartzose sand nearly as large as mustard seed.

Yet it has been erroneously asserted that the Nile brings but little sand to the sea, to influence the littoral shallows lying off its delta.

To test this point more certainly, several dredges were taken within the mouths of the Rosetta and Damietta branches, from five to ten miles above their embouchures, and the following were the results:—

In a dredge taken in seven fathoms near the town of Damietta, the proportion of yellow quartzose and black iron sand to black slimy mud was 45 per cent. The sand in which being of unequal size explained the origin of the variety of sand which is generally found on the dunes within the sea shore, or on the shallows off the coast, and where

the action of wind or wave sifts and gathers them according to their size and gravity.

But at about four miles below Damietta the dredge, in 28 feet, brought up black slimy mud, in which the proportion of sand to mud was only 10 per cent. Also, in the Rosetta branch, at about nine miles from the entrance, the bottom contained about 20 per cent. of sand; and, again, at five miles from the embouchure it contained about 40 per cent. of silicious sand. The sand and mud in this entrance came up in separate lumps, so that one sifting would yield 20 per cent., and another 50 per cent., or more, showing that the mud was probably only a superficial covering. Below this, at two miles from the entrance, in three fathoms, the bottom brought up contained only 15 per cent. of sand, indicating the irregularity of the distribution or mixing at this, its low water season. And the river being this year unusually low and sluggish, it transports comparatively little to the sea at this time, merely such light particles of matter as are easily held in suspension in moving water, and which I found to be only 17 grains per gallon, with an average current of one mile.* So sluggish, indeed, was the Nile at this time, that, if the sea was calm, hardly any discolouration or turbidity was shown, except immediately off the mouths of the river, or on a narrow zone of two or three miles along the coast.

The greatest strength of the current in the Damietta and Rosetta branches did not exceed $1\frac{1}{2}$ of a mile at the surface; but at the sides of the river and bottom it was insensible. Consequently, as the bed of the river at Damietta and Rosetta is seven fathoms deep, it is much below the sea level. The river water at Rosetta and Damietta was found to be slightly brackish, and it is not in general considered drinkable at low water Nile,—that is, for about three months of the year.

Thus at dead low Nile it transported comparatively little matter to the sea, being merely such as it holds in suspension, as mud or fine silicious particles; and finding any sand at this time within the mouth of the river under so sluggish a current indicates the large quantity of sand which the Nile must bring to the sea while flooded.

The quantity of matter brought down to the sea at high Nile is a point that has not, I believe, yet been fully ascertained; but it is estimated to be four times that of the Rhine. Before Cairo at high Nile 1,046,416,800 cubic yards of water flow per hour, as shown by M. de Lesseps, 3rd series, p. 19; and from the facts I have here given it can be inferred that the proportion of sand is much greater than has been generally supposed; particularly, also, when it is remembered that at low Nile the river is everywhere so encumbered with banks of shifting sand as to greatly impede the navigation.

The transporting power of the Nile, in respect to the moving these

* The surface water at Atfeh in October contained 67 grains of mud per gallon, which is just twelve times as much matter flowing per hour (the average current being about three knots) as the surface waters at the embouchures contained at low Nile in the month of May.

sand banks towards the sea, may be judged when it is known that the current is increased to three and four miles an hour at that time; and that it then rises 24 feet, as an average, and sometimes 27 feet at about fifty miles only above its embouchure. At the Danube it is not half that. The changes also in the bed of the Nile at different seasons are enormous,—parts of its channel 30 feet deep having been known to be entirely filled during a season; from whence its scour at that season may be imagined.

The Nile partakes more of the nature of a torrent during its high flood, as compared with the more sluggish Danube, the banks of which within the delta are but slightly encroached upon or altered. Whereas the Nile sometimes altogether washes away large masses of its sandy banks, depositing them elsewhere. Thus, at Atfeh, the doorways of the magazines and houses that were built when the Mahmudiyeh Canal was opened, are now fully three feet below the level of that embankment, the occsional level of high Nile fluctuating on thus receiving any such surcharge of matter, or by being checked through any increased deposition in its bed.

The large quantity of sand which the Nile contains in the matter it contributes to its delta is likewise made evident by the coarse nature of the Nile pottery and brick. For it is a well known fact that the Nile delta, muddy as it is supposed to be, cannot anywhere produce a good quality of brick, being too coarse or sandy. This fact is also a very significant explanation of the quantity of silicious sand which the Nile must bring to the sea during its annual floods, in connection with its proverbially turbid nature at that time.

Another fact which must be kept in view in considering the effect of the littoral dispersion of the Nile's deposits upon a harbour formed to leeward of it, is that when the Nile is rising or highest, strong N.W. winds prevail for three or four months; so that without this species of monsoon or trade wind of Egypt, the Nile could not be navigated at that season. But the effect of this prevailing wind on the dispersal of its deposits along the coast is the point to be kept in view, viz., that when the Nile is discharging its largest quantity of matter into the sea, and producing the greatest influence on the prevailing littoral waters, the prevailing winds are also increasing these currents, and producing a greater dispersion of the drifted matter, by the constancy and force of its wave effect along the coast. It will be seen from our dredging, and the examination of the sand dunes on the coast, that there is an undoubted movement of the sand in the depths, both along the shore and also within the shore, commencing from the Rosetta mouth and extending to the Damietta; so as to add considerably to the deposits which the latter disperses to the eastward of its embouchure.

Having now seen that the bed of the Nile within its mouth contains a large proportion of sand, let us now see, from the dredges taken in the sea directly off and to the eastward of its mouths, the extent of the Nile's influence in these directions, since it does not reach more than ten or twelve miles to the westward of the Rosetta mouth.

The margin of the Nile's westerly influence is both very defined and very limited; to the eastward it extends as far as the shoals off Kas Burun or Ras el Ghels; and I have no doubt that had my examination continued to El Arish and to the coast of Syria the same pure Nile mud or its silicious sand would have been found there.

It will be observed by the charts of the Nile's deposit, which charts are the result of the excellent surveys of my friend and coadjutor Captain Mansell, that at Brulos the sand hills in any size or quantity first appear. From thence they extend unbroken as far as Damietta, varying only in height from 10 to nearly 100 feet, terminating steeply over the left bank of the Damietta branch, and seem to have caused a bend there by thus encroaching upon it.

This bend is about three miles below Damietta, and from it to the embouchure dunes of blown sand are continuous all along the left bank, partially burying one or two marabouts on that bank. But no sand is seen to accumulate on the eastern bank of the river. There it is constantly cultivated throughout. The western bank, on the contrary, is almost devoid of cultivation for seven or eight miles from its mouth, through the constant re-accumulation and movement of blown sand upon it from the westward; and which consequently wholly falling into the Damietta branch, then again becomes transported to the sea, only to be finally dispersed more to the eastward.

The westerly gales and prevailing N.W. breezes are undoubtedly the main causes of this line of sand dunes from Cape Brulos to Damietta; for as fast as the wind removes the sun dried sand from the beach, the surf of every gale throws up more.

This was not only evident by an examination of two or three intermediate localities, but was confirmed by the natives wherever I landed. At times it completely buries the huts of the coast-guardsmen; and in strong gales from the westward (the quarter described as that from whence the sand comes) it is not possible to walk against it. Such is the description of the movement given me by the natives on the coast between Damietta and Rosetta, who also attribute the re-accumulation of the sand to the sea, adding that a general movement of the beach occurs from West to East.

The prominence forming Cape Brulos is a point resulting from the current from the Rosetta mouth carrying its deposits to a certain distance off the coast, and then the westerly and N.W. wave stroke driving them back again upon it in an oblique direction to the shore.

The sands thus thrown upon it by the surf and accumulated in dunes are perpetually moving before these winds towards the East. Yet the vicinity of these dunes is very fertile, and the system of cultivation is very curious and instructive, in illustrating the perpetual movement of these sand hills; which I found to be composed of a fine silicious sand, and *identical with the sand banks formed within the Nile*, and *the shallows of the sea off its coast.*

At the high Nile so large a quantity of fresh water flows into the lake of Brulos that it is perfectly fresh at the Boghaz. The sand hills absorb so much of the fresh water at this time and during the

winter rains that they retain it sufficiently to enable the Arabs to inhabit and to cultivate any flat ground lying between the sand ridges. Palm trees in great abundance consequently flourish on the South side of these dunes or amongst them; and the mere sand lying in the hollows between, without a particle of soil to bind it, produces the finest melons in Egypt. But to prevent each patch of cultivation (which does not often exceed 100 and 200 yards each garden, and seldom so much) from being covered by these moving dunes before the crops are ripe, the natives endeavour to fix their surfaces by staking hedges of dried reeds across them: which hedges act as land groynes against the land drift, just as piers on this coast will act as sea groynes against the sea drift.

Thus the whole of the dunes for an extent of fifteen miles are seen to have their surfaces intersected with these hedges, intended to arrest the blown sand during the season of cultivation. To a certain extent they succeed, causing the sand dunes to become piled up into high and sharp backed ridges. But before the dune is dispersed a part of the garden has been encroached upon and buried, so that the same spot is rarely cultivated for two consecutive years; and if it were not that the loose sand thus retains fresh water, it would not be possible to cultivate the hollows between them.

And yet the best efforts of a population of several thousand Arabs, who inhabit the villages along this strip of land, fail in permanently fixing these dunes. For as the sea continually supplies the sand on the beach, onward it moves in spite of them; and the rate of progress may be imagined when it is known that a mosque near Brulos has in about twelve months been nearly buried in one of the dunes formed and moved from the shore to the westward of it;—a good instance of the prevailing direction of the movement. Another is, that when the inhabitants of any of the villages intend to cultivate a level spot between the sand hills, they immediately construct reed hedges across the dunes to the westward of it. Some of the dunes become so elevated by the repetition of these hedges that they are nearly 100 feet high, and very steep.

(To be concluded in our next.)

Remarks on the Winds and Currents of the West Pacific Ocean.—*By Captain Hunter.*

Mr. Horsburgh briefly states that the West monsoon, which blows regularly in the Indian Ocean, extends to New Guinea. This monsoon blows as steadily, strongly, and regularly along the North side of New Guinea, at New Britain, New Ireland, and all contiguous islands South of the equator, so far eastward as Malanta and the northern part of the New Hebrides, as in any part of the Indian Ocean what-

ever; and extending in a wind of gradually decreasing constancy and continuation from hence far eastward to the Society Islands and Marquesas. The limits in latitude appear similar to the Indian Ocean, from 1° N. to 15° S., occasionally to 19° S., and the period from the beginning of January until the end of March.

Having said thus much, as this is written principally with the idea of endeavouring to show the practicability of making passages to the eastward in the Pacific (instead of the circuitous route round New Holland), which I have never heard has been attempted by trading vessels, although performed by whalers continually, I proceed to state a few facts of such passages; and will first attempt to prove the practicability of making a passage to the eastward during the easterly monsoon in South latitude, or from April until December or January, by keeping to the northward of the equatorial current, and between the trades or monsoons.

In October, 1835, being off the Asia Islands, and wishing to make a passage to the eastward, winds light and variable and current running strongly to the westward, against which we could make no progress, stood to the northward, and on the 19th of October were in lat. 2° 6′ N. and long. 134° 11′ E. Having lost the westerly current, pushed to the eastward between the parallels of 2° 15′ and 2° 34′ N. On the 27th were in long. 147° E. From hence stood to the southeastward and made Matthias Island,—it being my object to cruise in this neighbourhood. On the 30th passed through St. George Channel quickly, current favourable, and to the Treasury Islands. Cruised here until 19th of December. Started with a westerly wind, which carried us to 169° 36′ E. on the 26th, having passed on the South side of Banks Islands. Becalmed two or three days; then with variable winds, chiefly from E.S.E., proceeded to the southward, and anchored in the Bay of Islands 15th of January.

These passages were made at a season deemed impracticable, before the West monsoon had set in steadily, by a southseaman of moderate sailing qualities, without using studding sails. The passage to the eastward may, I am convinced, be made at all seasons by pursuing the same plan; which is, as before stated, to keep to the northward of the equatorial current, and between the trades or monsoons. Here you will have a variable wind, chiefly from the westward, with a drain of favourable current at times.

Further to corroborate this opinion,—June 23rd, in 1° S. and 149° E., having been drifted from Matthias Island and New Hanover by a westerly current of two and a half or three knots an hour, stood to the northward, got westerly winds on the equator. With these made easting, and on the 27th reached 155° E. and 0° 45′ S. Made Bouka Point soon afterwards; then found a current equal in strength to that at Matthias Island. At this time the westerly current did not extend quite to the equator.

Again, in September, 1840, being unable to hold on near the Admiralty Islands, in consequence of strong westerly currents, stood to the northward, and when in 0° 24′ N. and in 146° E., proceeded to

2° N. before losing the current; then worked to the eastward, and stood to the southward on the East side of the Green Islands, which are in about 156° E. The passage from Morty to Bouka has also been made in August by adopting the same plan. Although all these passages terminated in the longitude of the Salomon Islands, it was not through inability to proceed farther to the eastward, but merely in consequence of this being the destination. More might be quoted tending to show that these line currents seldom extend northward of 2° N.

During the West monsoon in South latitude it has been a common practice, the last fifteen years, for ships to make passages from Timor to the Salomon Islands; some returning at the commencement of the easterly monsoon, and others spreading over the Pacific. Last year, five ships, which had been cruising in the Indian Ocean, proceeded eastward between January and April: one along the line to the eastward of the Kingsmill Group, another to the Salomon Islands and New Zealand, and the remainder to New Ireland and elsewhere. From all which I wish it to be inferred that any ship leaving Manila between the beginning of December and the beginning of March, or any port from which she can reach the North end of the Molucca or Gillolo passages, or Dampier Strait, between the middle of December and the middle of March, will make a speedy passage to any part of the Pacific Ocean in East longitude; and that during all other seasons the passage is practicable by keeping northward of the equatorial current and between the monsoon winds.

In the period of the West monsoon northerly and N.W. winds prevail to the Cape of Good Hope of New Guinea. Passing eastward of this point the westerly wind will generally be experienced fresh and steady, with a current of two or two and a half knots running to the eastward, and extending from the New Guinea shore to about 1° N. A ship may pass near the St. David Islands without risk of losing this wind or current, and northward of Providence Islands. From hence any of the passages may be chosen, according to discretion. That by the eastern Dampier Strait, although, perhaps, the most direct if bound to Sydney, I should not recommend until the islands northward of New Guinea are more correctly inserted. If St. George Channel be adopted it may be preferable to steer along the line until in the longitude of the Admiralty Islands; then pass to the southeastward between these and Matthias Island, thus avoiding the low islands and reefs to the southward. Sail could be carried during the night without fear. Keeping along the equator there cannot be many undiscovered dangers, this track having been a good deal frequented of late years. The other route to the northward of the Salomon Islands, when bound to New Zealand, the Feejee Islands or anywhere to the eastward, appears to be the best. In the case of New Zealand, the tenth degree of South latitude should not be crossed until reaching long. 171° or 172° E.; then steer to the southward on the West side of the Feejee Islands, passing pretty near, as the easterly winds prevail far to the southward in January, February, and March; but

by weathering the reefs near the South end of New Caledonia a passage may always be effected.

The westerly monsoon in the Pacific, as in the Indian Ocean, is attended with cloudy overcast weather, squalls, and heavy rains. Some of these squalls are very severe, requiring all sail to be taken in when crossing the wind; even when running close reefs will be found enough. I have experienced several near New Ireland and New Guinea, which generally gave warning and commenced at W.S.W., blowing furiously the first hour, and continuing in a strong gale, veer to the N.W. for five or six hours.

From lat. 10° S. to the southern tropic hurricanes are likely to be experienced from November until April agreeing also in this respect with the Indian Ocean; and I make no doubt that one of these occasioned the loss of La Perouse and his fellow voyagers. These scourges of the sea are more prevalent near the New Hebrides and New Caledonia than the Feejee Group and Friendly Islands. In fact, the liability to hurricanes appears in exact ratio to that of the S.W. monsoon, or rather to the meridians in which the westerly monsoon blows, differing in latitude; the monsoon seldom extending beyond 17° or 18° S.,—indeed, at times 13° S. is the limit,—whereas hurricanes are experienced as far as the tropic.

From all that I can gather of these hurricanes of the South Pacific, having conversed with several masters who have encountered them, some of whom have had their ships dismasted, I scarcely think they are of that terrific description occasionally experienced elsewhere; and am almost inclined to believe them more often and more severely felt near the islands than well clear of the land, although aware of this disagreeing with the new theory; but future facts will be necessary to elucidate this subject.

They are still of unfrequent occurrence in the Pacific, several years intervening without any ship encountering one. I possess no facts which would be serviceable in pointing out their track or direction of rotation. They will, without doubt, be considered to agree with other places in the same latitude, yet a few more well authenticated descriptions of these southern hurricanes would not appear to encumber the evidence of their uniformity in these particulars.

Near the Friendly Islands (and perhaps elsewhere) storms occasionally happen of extreme violence, blowing from one point and producing similar effects to hurricanes. In November, 1835, eight or ten ships, English and American, encountered one of these near Tongataboo and Eooa from S.S.E., the heavy part of which lasted about eight hours, causing more or less damage to all,—one or two were dismasted. It was described by the masters whom I saw, which included most of them, as being more severe than anything they had ever seen. Ashore at Eooa, it was most violent,—houses and trees blown down and all the crops destroyed. It likewise did great damage at Tongataboo, and was also felt very severely at the Hapai Islands and Vavaoo. Here, Mr. Thomas, the missionary, was obliged to shore his house up, although it was considered by the natives that a gradual decrease in

strength had been experienced in proceeding northward. Still further North, the *Nassau* encountered it in 16° N., in the shape of a heavy gale. At all these places the wind was from the southward,—S.S.E. by the ships; ashore they had no compasses, but it certainly was from the southward and without shifting. I have thus endeavoured to be explicit, through an impression that more is required to be known of hurricanes and gales in localities, and having a strong belief that many of the hurricanes, even those producing the most disastrous effects, will be found very local.

Reverting again to the N.W. monsoon:—at the Salomon Archipelago it commences in December or January. In some years these months are tolerably fine. During February and March strong winds, with severe squalls and heavy rains, may be expected. April generally is a fine month, with variable winds; also in May there is a good deal of fine weather. The S.E. monsoon sets in strongly in June, with heavy rains and squalls, and continues so until the end of August: in all these months, nevertheless, there are considerable intervals of fine weather. In September the strength of the monsoon is spent, and the weather is more moderate from this time until the return of the north-wester.

Farther to the eastward, about the meridian of Rotumah, the westerly monsoon is less constant, beginning generally in January, and blowing strongly about seventeen or eighteen days consecutively, then declining; and, the easterly wind returning in a fresh breeze for nearly the same period, the westerly wind again intervenes, usually commencing with a gale, and always continuing in a strong breeze, with squalls and rain;—the easterly and westerly winds thus alternating until the end of March, when the S.E. trade sets in steadily. Proceeding still further to the eastward the westerly monsoon gradually becomes less constant, and finally disappears, I think, somewhere about the meridian of the Marquesas Islands.

Of currents I can only speak in very general terms, these being subject to great changes in many localities. From 1° or 2° N. to about 3° S., a current of two or three knots an hour prevails, taking its course from the wind, which is easterly during the greater part of the year: current, therefore, westerly. I have, however, experienced an exception to this. In July, 1833, on the equator, in long. 175° E., a current of about the strength already mentioned ran to the eastward for fourteen or fifteen days, although the wind was then fresh from the eastward; and I believe such changes have generally occurred once a year, probably induced by a strong S.W. or westerly monsoon in North latitude reaching at this time near the line. They are fitful changes and not to be depended on, nor can I state their extent eastward.

In other parts of this ocean, well clear of the land, there appears to be very little current. Mr. Horsburgh speaks of a drain to leeward, and this seems to express all there is. Indeed, I think the swell may almost account for it; therefore it is obviously not such a serious matter to fall to leeward in the Trades as may be imagined; almost any ship with perseverance may work to windward, the wind varying con-

siderably, and veering at times far to the southward. For instance, in April I have worked up in a dull sailing and leewardly ship from the reefs off New Caledonia to the West side of the Feejee Group. From thence, in June, to the islands called by the natives Fotuna and Alloaffy, (marked in one as Alluffalli in the chart,) and from thence to Wallis Island. Moderate westerly winds of two or three days duration happen in nearly every month.

Off the islands, so far as my observation extends, the currents decrease in strength in proportion to the increase in latitude, that is, the nearer to the equator the stronger the current, and generally with the wind. There are no doubt many exceptions, but without an account of each island, which I am unable to give, no statement can embrace all the particulars, yet one or two instances of such deviation may be mentioned. Cruising to the southward of New Georgia and Bougainville Islands throughout the S.E. monsoon from May until October, in the years 1836 and 1840, the current ran strongly to the S.E. against a strong wind and heavy swell, although at the same time on the North side of these islands it was running as strongly to the westward. Off the North side of New Ireland, where a westerly current prevails, changes to the eastward occur for ten or twelve days at all seasons.

In concluding these remarks, I may be permitted to hope that some of your readers will follow them up. The winds of the western part of the North Pacific seem very imperfectly known. No statement has appeared of the eastern limit of the S.W. monsoon; it certainly enters this ocean. In June I have run to the northward, keeping about 3° eastward of the Philippines, with a fresh and steady breeze from S.W. The same wind prevailed until reaching 27° North and 138° East.

Guam and the other islands of the Ladrone Group are also understood to be subject to hurricanes, for which the inhabitants prepare by lashing down and securing their houses; yet the seasons at which these are most likely to be experienced are not generally known. Having only crossed this locality once or twice in making passages, I can merely give hearsay evidence. The present Governor of Lamboangan, who has resided in Guam two years in the same capacity, informs forms me that in June, July, and August, also in December and January, they are expected. December, 1832, the *Japan*, a new ship, encountered a severe hurricane in 13° North and about 160° West, the meridian of some of the Sandwich Islands, in which she was totally dismasted, and fears were entertained of her weathering it. This is the farthest to the eastward in the North Pacific of which I have heard.

[The foregoing important paper, contributed by Captain Hunter to this journal in 1843, is reprinted here with the view of showing that the passage from Singapore to Sydney may be made at all times of the year by the North coast of New Guinea, as pointed out by him in the last number. Our readers have now the three passages before them,—but we recommend them to the experience of Capt. Hunter.—Ed.]

A Whaler's Visit to Hakodadi.

The impression generally received by shipmasters is a favourable one of the port of Hakodadi; and the treatment received from Japanese officers and others with whom they came in contact, was courteous, and in no sense annoying. We judge, however, from all the information we can gather, that the pleasure of a sojourn there or a visit, arises more from the novelty of the scenes met with than from any superior advantages offered for recruiting; for on this score it would appear that there are many disadvantages.

Leaving Cape Elizabeth in the Ochotsk Sea, in company with the *Rapid*, October 1st, 1857, the *Adeline* steered South through the Saghalien Sea for Perouse Straits, and in the passage encountered heavy gales and bad weather generally. Passed through the straits October 15th in a thick fog, seeing no land except a rock which lies in the passage. After passing the straits they had the same heavy weather and gales, mostly from the S.W., which was dead ahead, and arrived at Hakodadi on the 22nd of October, after a passage of twenty-two days,—an average passage from the Ochotsk to Honolulu. Captain Taber thinks, however, that the passage can be made in ten to fifteen days. We quote the letter:—

"About twenty minutes after we had anchored, the Japanese officials made us a visit, and I was surprised to see such a noble and intelligent looking people. Upon arriving on board, the interpreter introduced himself and his fellow officers, who by the way could not speak or understand English. The interpreter asked, 'What for you come here?' Upon being told that we came in for supplies for our ship and people, he asked 'What kind of supplies we wanted?' I told him that we should want wood and water, fresh meat and vegetables, together with the products of the country generally. This was made known by the interpreter to the high officer in attendance, who made known to us through the same medium that we should have everything we wanted that the country afforded, and they all appeared much pleased with our visit to their country, and quite as much with their visit on board our ship. We were therefore received with a hearty welcome, and a free pass given to come and go whenever we liked; and I would here say that the government, from the time we arrived until our departure, did, as they said they would, all they could to make us comfortable while there, and furnished us with all necessary supplies.

We found that we could obtain most of the necessary supplies that ships stand in need of. First, we got fresh beef, being the first, as I was informed, furnished to any merchant or whale ship. The beef is tender and very sweet, and costs about eight cents per pound. The Japanese do not kill beef cattle to eat themselves, nor do I remember seeing beef cooked as food in any way on shore; but when they came on board ship they dropped all scruples they ever had on that matter,

and put a good quantity out of sight, as if they owed somebody a spite. Potatoes were also obtained, which were of an excellent quality, though small, and as to quantity there seemed to be an abundance; but, from some cause or other, quite a number of whale ships in the spring could not get potatoes. It was reported that they lost a great many in the winter by frost and by the severe thaws that take place after the heavy snows overflowing the potato holes or cellars. They say such failures shall be remedied another year, though, in fact, they know very little about raising potatoes or taking care of them after they have raised them. They are very much like other people in counting the cost, and, if anything, a *little more so*. There was also plenty of rice, and some of the best rice I ever saw, at two cents per pound; quite a variety of beans, sugar, rice, flour, buckwheat flour. Abundance of fish of a very nice quality, and fresh cod were caught in the harbour all winter.

There was also an abundance of chickens and eggs, and in the winter venison was plenty, all of which could be bought at reasonable rates, if the money could be got at at a reasonable rate, which was the most vexatious thing met with in our stay there. The government pays for gold coin twenty-two cents for the dollar, and silver coin (except only Spanish and Mexican dollars, which passed at six per cent. discount,) went by weight, the average deduction being about one third or thirty-three per cent.; to say nothing of drawing a bill at fifty per cent. discount, to which ought to have been added, one half at sight and the remainder *in a minute*. However, we got through it in the way of general average pretty well after all.

The harbour of Hakodadi cannot be surpassed for safety. It is sufficiently large to shelter several hundred sail of vessels in an anchorage averaging from three to eight fathoms water, with soft muddy bottom. The harbour also abounds with sea fowl in winter, of various and choice kinds, to say nothing of the sport of taking them.

The Japanese are a very shrewd and close-calculating people; they offer us about one fourth the cost of our goods, and when we refuse to sell, they say, 'Very well, what we cannot make ourselves there is no use of our having;' but time will drive that notion out of their heads, because they are very fond of dress.

As the Japanese become more acquainted with the American people, their manners, customs, &c., they will drop many of their own absurdities. A few American residents with a store or two would do much to begin the work. While we were there, the people were not allowed to receive or make any presents, which was, of course, a difficult thing to control, the curiosity of both parties being very much excited. Several books, pictorials, magazines, Godey's, Harper's, &c., were sent back, and the people punished that received them.

There might be a great deal more said about the Japanese that would appear strange to us; but I hope to find them more enlightened and less exclusive should I visit them again, which I hope to do."

In regard to beef and other animal meats, Mr. Heeko, the Japanese on board the *Fennimore Cooper*, states that cattle are sacred. According to the Japanese religion, all animals that utter a sound are held as sacred, and never killed for food. Hence faithful Japanese never eat beef, venison, pork, veal, mutton, nor birds of any description. Their food is confined to vegetables, grains, principally rice, eggs, and fish. Mr. H. states that he never tasted beef till he visited America. That, as well as other meats is considered as filthy, and viewed as we view dog and cat's meat. The Japanese, however, will furnish cattle and fowls to foreigners, but do not like to kill any animals.

Vegetables can be had there. The yam is abundant, and also the sweet potato. They have also a vegetable of a long and slim shape, which looks like some variety of potato, but tastes much like taro. The Irish potato has been introduced only within a few years, and is cultivated mostly about Hakodadi for the use of ships. The climate of Japan being cold in winter, our whale ships, which generally touch in the spring, visit that country in the worst season in the year to procure vegetables. However, potatoes will, doubtless, be abundant in a few years.

Perhaps the greatest obstacle to a free exchange of commodities with Japan, is the currency. The sacrifice or discount made on foreign coins, will prevent whalemen from trading or procuring supplies to any great extent as long as it exists. From Mr. Heeko we have gathered some facts in regard to the currency which may be of service to captains visiting those ports. The standard of Japanese coins is regulated by the Imperial Government, while the Departmental or State Governments are alone empowered to issue paper money, which varies in value from 10 to 1,000 cash. There are copper, silver, and gold coins, three of each kind. The copper coins are flat and of an oval shape, with a square or oblong hole in the centre, and are of the value of one, four, and one hundred cash. The cash is the unit of Japanese currency, and though only of the value of one tenth of a cent, corresponds in their currency system with our mill.

There are three silver coins, of an oblong shape, flat, and about the thickness of a half dollar,—the *e-she-woo*, of the value of eight cents, the *ne she-yu*, sixteen cents, and the *e-che-boo*, thirty-two cents. The largest silver coin, called *e-che-boo*, takes the same place in the Japanese currency that the dollar does in the American, the smaller coins being halves and quarters.

The gold coins are three likewise, of the respective values of sixteen, thirty-two, and one hundred and twenty-eight cents.

These gold, siver, and copper coins, have their value impressed on them in Japanese characters. Although one of the above gold pieces is rated in Japan as of the same value as the thirty-two cent silver piece, which is about double its weight, the mint value of the gold piece in America would be about two dollars fifty cents. The most singular feature in the Japanese currency is the low value of gold compared with silver. This is caused, we are told, not by any

greater abundance of gold there than in Europe, but by the value being thus fixed by law, and sanctioned by usage. So long as traffic with foreigners was shut out, and all other causes that have tended to establish in other countries a greater difference in the value of the two metals, are excluded, no annoyance would be felt in the standard of gold and silver, even though they were fixed by government at the same value weight for weight: but as soon as the European standard of the two metals is brought into contact with the Japanese, it causes confusion and loss. For the present foreigners have to bear the loss of eighty cents on a dollar on all gold taken to Japan, and thirty to forty cents on a dollar on all silver taken there for trade, excepting Mexican dollars, which latter coin is about the legal Japanese standard of fineness; but as no foreign coins can pass, except by weight, Mexican dollars have to be recoined.

The Japanese appear to be expert in refining gold and silver. When silver is tendered, they will recoin it into their standard coins and return it to the foreigner, charging for their services six per cent. The foreigner, however, has to submit not only to this coinage charge, but to the further loss of whatever alloy may have been in the coin. Supposing one hundred dollars in five-franc pieces are taken to Hakodadi, and recoined into Japanese currency, the sum returned to the party taking it their will be two hundred (more or less) *e-che-boos*, equal to sixty-four dollars, less the charge for refining. The best way for persons going to Japan is to take silver bars. These are taken by weight, and generally at nearly their market value.

Until this irregularity between the currency of Japan and that of foreign countries is corrected, in a measure at least, trade and commerce with Japanese ports must be very limited. It is on this account, chiefly, that we think it will be many years before whalers will find it to their advantage to make Japanese ports their places of regular recruiting. As long as they can procure potatoes and beef in plenty in their spring visits to Hakodadi, they will find it to their interest to go in there. But the bulk of their supplies cannot at present be furnished there, except at the most exorbitant rates of discount on the money or bills tendered in payment.

Mr. Harris, U.S. Consul General at Simoda, made a very important treaty with the Japanese Government, and Lord Elgin subsequently made an English treaty.

The American treaty provides:—

1.—That the tax of six per cent for coining our money into theirs, now paid by the American purchaser of Japanese exports, shall be dispensed with.

2.—The annual practice of trampling on the cross, which has existed at Nagasaki only, since about the year 1620, is to be continued no more after the 4th of July next; and our ministers and families are to reside at Jeddo.

3.—The provisions of the treaty to take effect from and after July 4th, 1859. The opening of some new ports form an exception to this article.

4.—Americans may build churches and worship their God, and religious freedom is also granted to all Japanese.

5.—The port of Simoda is to be closed, and that of Kanagawa opened in its place. Hego and the great city of Osaca, of which it is the seaport, are also to be opened. At Hego the water is so bold that vessels may moor close alongside the beach, and the back country is the most productive and thickly populated of Japan.

6.—A stipulation is made in the article that opens Kanagawa, which is only seventeen miles from Jeddo, the latter still being closed to foreigners. Mr. Harris says, however, that this will not last long. Such a stipulation was necessary, for, by Commodore Perry's treaty, we should have been allowed to ramble around Kanagawa to such a distance that the sight of Jeddo would have been included.

7.—Japanese coin may be exported, but in the purchase of it American gold must be weighed against Japanese gold, and silver against silver. The copper *(T'seny)* shall be excepted by this article, unless it also be weighed against copper coin.

COAL AND MONEY IN JAPAN.—A correspondent of the *Philadelphia Ledger*, writing from Simoda, says:—

When Commodore Perry made our first treaty, there was but one coal deposit known in Japan,—that near Nagasaki. Now they are working a second near Hakodadi, at the other extreme of the empire, and quite lately a third mine has been opened near Jeddo. Thus we have coal in the centre and at each extreme of the empire. Its quality, however, is none of the best, at least so much of it as came under our observation. It contains sulphur, iron, pyrites, is semi-bituminous, liable to spontaneous combustion, and leaves great quantities of ashes and clinker. Three years since I was so unfortunate as to have to burn it with small flue boilers; and then we had to "haul fires" every twenty-four hours to "clean flues," it made so much soot. Now we find it to burn like tinder in these large flue boilers of ours; but it almost smothers us with its sulphuric vapour, its dense black smoke, and its showers of powder-like soot. For that which we obtained at Nagasaki we paid three dollars fifty cents the ton, but for another lot which is now coming on board we shall pay six dollars thirty-seven cents. These prices include the straw sacks in which it is put up, the labour of filling them, and the hire of boats for bringing it on board. The reader will be surprised to hear how cheap labour is in Japan,—the daily hire of a coolie, he finding himself, is eight cents.

Let us now turn from the subject of coal to that of money. Gold in Japan does not represent the value that it does in other countries, at least not until the 4th of July next. Sixteen gold dollars in the United States are exactly equal to sixteen silver ones; that is, they

weigh sixteen dollars' worth of gold minus the alloy. Here, however, the same amount of gold is only worth a fraction over five dollars fifty cents. Or, in other words, with us the relative value of gold and silver is as 1 to 16, and in Japan as 1 to 5½.

We would call the attention of shipmasters to Messrs. Eastra & Co. at Hakodadi, Japan. We are assured that they are prepared to serve promptly. A letter from the U.S. Commercial Agent at that port, dated September 10th, says:—"The Japanese are becoming less exclusive. They now furnish in abundance for ships' use hogs, potatoes, vegetables of all kinds, and rice. By a new treaty, made since you were here, Americans can reside here permanently after the 4th of July, 1859. I have no doubt that importations from the United States will be made soon, as at certain seasons of the yaar such merchandise would pay well. Americans residing here are subject only to American laws. The treaty is in force so far as the Japanese are concerned. They say, "Come, the more the better." Mexican dollars only should be brought here. All other kinds are nearly worthless."

Great Volcanic Eruption of Mauna Loa, of the Sandwich Islands.

It would appear from all accounts to be the most beautiful eruption which has occurred on that island during the memory of the oldest inhabitants, and probably for fifty years at least. Volcanic eruptions are of frequent occurrence on Hawaii; but it is rare that one has been found to combine an extensive flow with the high and beautiful ejection of lava above the mouth of the crater, which the present one has. Probably the quantity of lava emitted from the crater of Mokuaweoweo in 1855 was larger, but, if we remember rightly, it was not thrown up in columns above the mouth of the crater, but simply ran out of the side of it through a deep gulch,—the lava being first perceived some miles below the crater. Mr. Coan, in an account of his visit to that crater, published in July, 1856, says:—

"The grandeur, the sublimity, the terror of the scene were unutterable. A vast chasm had opened horizontally on the top of the mountain, and along this yawning fissure stood a series of elongated, jagged, and burning cones, about 100 feet high, rent through this larger diameter, and throwing up dense columns of blue and white smoke, which covering the mountain's summit, rolled in fleecy masses down its sides and spread out like the wings of chaos over unmeasured regions. Still no fire could be seen in this fountain-crater. We could feel it everywhere, and we could see and hear its escaping

gases; but the throats of the cones were clogged with hot masses of cinders, pumice, and ashes, with cracks, crevices, &c., for the escaping smoke. The fusion had long since found vent in a lateral, subterranean duct, several hundred feet below the rim of the crater, and in this covered way it flows off until it makes its appearance, as described, some two miles down the side of the mountain."

Our camping-ground is located on the elevated table land lying between the three great mountains of Hualalai, Mauna Kea, and Mauna Loa, sixteen miles from Kailua, and some ten miles in a direct line from the crater, which lies over against us on the side of Mauna Loa, distinctly in view. This plain is some 4,000 feet above the sea, and is covered with small shrubs and trees, growing from ten to twenty feet high. In some places it is very level, being covered with a coarse black sand, similar to that found on the sides of Punch Bowl, only much coarser, while the shrubs are so sparse as to allow a horse to travel across it on a full gallop. In other places it is covered with a dense jungle with numerous pits or caves, concealed by overgrowing shrubs. This part of the plain is almost impenetrable. In still other localities it is covered with coarse lava stones or "clinkers," over which travelling is next to impossible. The nights are extremely cold, frost covering the ground every morning. The days, however, are warm and pleasant, and the air, both night and day, is cool and invigorating.

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

This new crater, for which we can find no native name except *Pele hou* (the new eruption), is located on the northern slope of Mauna Loa, at an elevation of, say 6,500 feet above the sea, and an equal distance from the summit of the mountain. It is some ten or more miles westward and about 4,000 feet lower down than the last eruptian of 1855, known as that of Mokuaweoweo. The course of the stream, from its source to the sea, we judge to be nearly N.W.b.N. The crater bears due East from Kailua by the compass, and is about twenty-four miles from that harbour in a straight line. Its latitude, as near as we are able to determine without instruments, is 19° 37′; long. 155° 40′. By referring to a map or chart, its position on the island can readily be noted. Our figures, we wish it understood, are only estimates, and accurate observation may prove that we are in error in some of them.

The actual size and form of the crater can only be determined by visiting its immediate vicinity, which we were not prepared to do. From the distance at which we observed it, about ten miles, and from

various points of observation, it appeared to be circular, its width being about equal to its breadth, and perhaps 300 feet across the mouth. This may be too moderate an estimate, and it may prove to be 500 or even 800 feet across it. The rim of the crater is surrounded or made up of cones formed from the stones and scoria thrown out, these cones constantly varying in extent, now growing in size and again all tumbling down. The lava does not simply run out from the side of the crater like water from the side of a bowl, but is thrown up in continuous columns, very much like the Geyser springs, as represented in school geographies. At times this spouting appeared to be feeble, rising but little above the rim of the crater; but generally, as if eager to escape from the pent-up bowels of the earth, it rose to a height nearly equal to the base of the crater. But the columns and masses of lava thrown out were ever varying in form and height. Sometimes, when very active, a spire or cone of lava would shoot up like a rocket or in the form of a huge pyramid to a height nearly double the base of the crater. If the mouth of the crater is 500 feet across, the perpendicular column must be 800 to 1,000 feet in height! Then, by watching it with a spyglass, the columns could be seen to diverge and fall in all manner of shapes, like a beautiful fountain.

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

A dense heavy column of smoke continually rose from the crater, but always on the North side, and took a north-easterly direction, rising in one continuous column far above the mountain, to a height of perhaps 10,000 feet from the crater. This smoke hovers over that island, and indeed all the islands, and must at times, when the Trade wind lulls, obstruct the view. During our stay, however, it passed off from the mountain, leaving the lower atmosphere quite clear. We watched closely to observe whether any steam could be seen issuing, either from the crater or from any of the streams of lava, but could not see anything that could be called steam or vapour, unless occasionally very small indications along some of the lava streams. None

rose from the crater itself—only a dense, heavy smoke, which came up out of the mouth itself. Considerable vapour rose along the stream, as the molten lava came in contact with trees and vegetable masses, but the mass of smoke came from the crater itself. Steam was noticed in various places on the plain, issuing from the rocks, and near one of the camps it was so extensive that a teakettle could be boiled over it. But this steam was undoubtedly caused by the heat of the lava stream, which was about a mile distant, coming in contact with some pools of water in caves or pits.

On leaving the crater, the lava stream does not appear for some distance, say an eighth of a mile, as it has cut its way through a deep ravine or gulch, which hides it from the eye. How deep this gulch may be is all conjecture, as it is impossible to get near enough to look into it, but it probably is several hundred feet deep. The first then that we see of the lava after being thrown up in the crater is its branching out into various streams some distance below the fountain head. Instead of running in one large stream, it parts and divides into a great number, spreading out over a tract of five or six miles in width. For the first six miles from the crater, the descent is very rapid, and the flow of the lava varies from four to ten miles an hour, according to the descent. But after it reaches the plain, where it is level, the stream moves slower. Here the streams are not so numerous as higher up, there being a principal one which varies and is very irregular, from an eighth to a half mile in width, though there are frequent branches running off from it. This principal stream reached the sea near Wainanalii, or about fifteen miles from Kawaihae, on the 31st, after a flow of eight days from the time that the eruption commenced on the 23rd of January. This stream, on reaching the sea, spread out to about half a mile in width. The sight of it as it poured into the sea, forming clouds of steam several hundred feet high, is represented by those who saw it as very beautiful.

Some of the finest scenes of the flow were the cascades or falls formed in it before the stream reached the plain. There were several of them, and they appeared to be changing and new ones formed in different localities as new streams were made. One, however, which appeared without change for two days, must have been 80 to 100 feet in height. First there was a fall, then below were cascades or rapids. To watch this fall during the night, when the bright red hot stream of lava was flowing over it at the rate of ten miles an hour, like water, was a scene not often to be met, and never to be forgotten. In fact, the lava near its source had all the characteristics of a river of water flowiug rapidly along, and gurgling with cascades, rapids, currents, and falls.

On reaching the plain, where it is more level, the lava stream of course moves along more slowly and in one general stream less divided than above. The stream which had run into the sea had apparently ceased flowing and was cooled over, so that we crossed and recrossed it in many places, and through the fissures we could see the

molten lava with its red hot glow, an intense heat issuing out from them. In many places the surface was so hot, that the soles of our shoes would have been burned had we not kept in rapid motion.

The length of the lava stream from the crater to where it enters the sea at Wainanalii we estimate to be thirty-eight miles. For the first ten miles from the crater the flow is divided into many streams—perhaps as many as fifty; but lower down it is confined to one or two principal streams, with frequent branches to the right and left.

On the afternoon of our arrival at the camping ground, a new stream started some few miles below the crater, which had evidently been dammed up by some obstruction, and came rushing down with tremendous noise and fury through the thick jungle which lay in its track, burning the cracking trees, and sending up for a time a thick smoke almost as dense as that from the crater. This stream, from the time it broke away from its embankment, moved along two miles an hour, till it reached the vicinity of our camp, when its progress was checked, and it moved not more than a quarter of a mile an hour. But it formed a grand sight. Here was a stream of lava rolling over the plain, twenty to twenty-five feet in height, and an eighth of a mile in width, though its width varied a great deal, sometimes broader, sometimes narrower. It was, in fact, a mass or pile of red hot stones, resembling a pile of coals on fire, borne along by the liquid lava stream underneath. As it moved slowly along, large red boulders would roll down the sides, breaking into a thousand small stones, crushing and burning the trees which lay in the track. It is impossible to give a true conception of the immense force and power of this lava stream, bearing along, as it does, an almost inconceivable mass. It reminds us most vividly of the breaking up of the ice in a large river, only the imagination must stretch the comparison and suppose the ice piled up twenty-five feet, and thus borne along by the current beneath, the whole width of the river moving at the same time, crashing and breaking and piling up cones and irregular masses on top. But even this comparison is far below the reality—to be conceived it must be seen.

Such, faintly described, is the eruption now going on on Hawaii.—A scene beyond the power of pen. And one can hardly turn from the scene of such a majestic display of nature without looking up to nature's God and acknowledging Him as the source of such grand and omnipotent power.

When one has seen the real thing itself, there is no room for the play of the imagination or poetry. You may exhaust language of its most impressive and descriptive terms, and yet fail to reach the reality. I shall attempt no more than to give a few facts.

On Sabbath, January 23rd, volcanic smoke was seen gathering on Mauna Loa. In the evening the mountain presented a grand yet fearful spectacle. Two streams of fire were issuing from two different sources, and flowing, apparently, in two different directions. The

whole region, earth and heaven, were lighted up, and even the interior of our houses received the lurid volcanic light direct from its source. In the morning of the second day we could discern where the eruptions were. One appeared to be very near the top of the mountain, but its stream and smoke soon after disappeared. The other was on the North side, further below the top, and was sending out its fires in a north-westerly direction.

On the second and third nights, the dense smoke and clouds prevented us from having a fair view of Pele's doings; but on the four following nights we had a view—and such a scene! It seemed as though the eye could never weary in gazing at it. The burning crater seemed to be constantly enlarging and throwing up its volumes of liquid fire above the mouth of the crater, I will not venture to say how high; and the fiery stream rolled onward and onward, still adding grandeur and terror as it proceeded, till, on the morning of the 31st, about sunrise, the stream was compelled, though reluctantly, to stop, by meeting the waters of the ocean. Even then its resistless and opposing energy carried it on some distance into the sea.

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

Last night (the 3rd Feb.) the volcano was in full blast, and the burning stream seems to have taken another direction.

Pacific Commercial Advertiser.

Extracts from a Journal kept on the Shores of the Ochotsk Sea.

The following are extracts from the Journal of an officer of an American whale ship, who, by accident or otherwise, was left on shore and remained among the Russians on the shores of the Ochotsk Sea for two months. The journal is quite interesting, the writer being evidently a man of observation.

The City of Ochotsk, July 5th.—While pulling alongshore in my boat to-day, I saw what appeared to be a large city a little way in-

land. Entering a river, I pulled up till quite opposite, when I was surprised to find nothing but a few miserable dilapidated houses; nevertheless, this is the famed city of Ochotsk. There is no governor and but few inhabitants,—the priest appears to be the principal authority. The church, which is the principal building, was rather fine looking exteriorly, surmounted with a large dome and a steeple with four bells. The first house I entered was that of the priest, to which I was conducted by a boy sent down to my boat for that purpose. He welcomed me to his humble dwelling very heartily, and I was hardly seated before the tea and milk were brought on, without which they seem to think there is no entertainment. The priest himself was a tall spare man, with long hair falling down to his shoulders. His wife, a very graceful woman, with her four pretty and well-behaved children, formed a beautiful family picture, and one that interested me much, the more so, as I had formerly thought the priests were not allowed to marry.

Nearly all the men were out fishing. Every house was hung round with fish, split and drying for winter use. The river appeared to be full of scaly inhabitants, for while pulling up it they were jumping out from under the oars in every direction. The first question put to me on landing by the few men I met, was whether I had any rum? On getting to the priest's domicile, he inquired the name of the ship and that of the master. These I wrote down on a piece of paper, and he pronounced them quite plain. His next question, which he took particular pains to make me understand, was whether we had any rum or wine on board? He went through a pantomime, by placing his thumb to his lips and crooking his little finger, and saying at the same time, in the plainest kind of English, "Rum!" I answered, as well as I could, that our ship was the strictest kind of temperance vessel, and that we had none on board.

I saw to-day some of the most beautiful featured and complexioned women that I ever saw in the whole course of my travels. Near where I landed I saw a spar, about the size of a ship's topmast, set into the ground, on the top of which was a plate, in appearance resembling block tin, on which I could make out the figures 1815 and some words, which, as I suppose they were Russian, I could not understand; neither could the priest enlighten me. After staying a couple of hours on shore, I left these simple people, much pleased with my visit, and returned on board.

Life among the Russians,—July 19th.—My trunk came up to-day from the Tonguse settlement, where I first landed, and this puts me in possession of my inkhorn—a great comfort. The distance was fifteen miles, and the Russians who brought it went and returned in fourteen hours, while on the previous day I was twenty hours in coming it; this may give some idea of a sailor's progress with his landtacks on board. These people are very poor, but very kind and hospitable. The house in which I am staying is used in winter as a store-house for fish, but as a residence in summer. Over my head are rows of fish hung up to smoke. Now is the busy season among

the people, for they are laying in their winter stock. The men go out fishing, and when they return with their loads the women take charge of the rest of the work and clean and cure them, besides doing the rest of the house work.

The Priest,—July 21st.—To-day I visited the priest of the village and took tea with him. He is a jovial fellow, and has a young and thriving family about him,—a lady-like wife and six children, the youngest not yet four months old. So it seems the Greek church does not insist on celibacy in their priests. This place beats Cape Ann for children; there are five or six in each family, and they appear all to be about the same size. * * * Going to the priest's house I saw some women at work in a potato patch. They use no shovel or hoe, but dig and plant with their hands. They raise a few turnips and onions, but the season is too short to allow much in the gardening line.

The Standing Fare.—This day it has rained quite hard and the men have caught great quantities of fish. Fish and milk are the standing dishes here. They have a small breed of cows which are very tame; these the women milk three or four times a day,—whenever a cow comes in sight of the house she is sure to be milked. I do not believe there are ten pounds of bread or flour in the town. They sometimes barter deer and other skins with the whalers for a few cakes of bread, which they prize highly. Tea and coffee are in like manner scarce. I sometimes got a cup of coffee once in a week at the priest's, and I certainly did not require a second or pressing invitation. Whatever these people have, they appear to wish to make me understand I am entirely welcome to. Thus poverty and hospitalitality go together in this bleak region.

The Dogs.—I counted about the house to-day one hundred and six dogs, the most of them tied up like horses with us, and used for the same purposes. In winter, they draw all the wood, and if the Russian wishes to make a journey of four or five hundred miles, twelve of these dogs are harnessed to a sled, and away they trot at a rapid rate of speed. They will accomplish that distance in four days.

A Religious Custom—Among these people, when a child arrives at the age of eight years, the parents take it to the priest, when he kisses that functionary's hand and receives a blessing. I was present to-day at the house of the priest when a little boy came in accompanied by his mother, and seeing me sitting near the door mistook me for the padre, and crossing his little hands by laying one in the palm of the other, attempted to kiss my hand. This, apparently much to his surprise, and much to the amusement of the good priest and his wife, I declined, when his mother, a tidy looking woman, led him in the right direction.

A Russian Sunday.—I promised to go to church to-day with my friend the priest, but there was a southerly wind with rain, besides which I had a bad headache, and consequently stayed at home. In the afternoon the priest called upon me, and in answer to my inquiry said there were but three persons at church, and they came for con-

fession. All the men of the place had gone out hunting or fishing. So much for the Greek church observance of the Sabbath. The peasantry, however, believe their religion to be all right, and they are happy.

At Church,—Sunday, August 2nd.—I went to church to-day. When I entered the building, thinking to find it filled with worshippers, but was surprised as well as amused to find that the priest's student, the bellringer, and myself, formed the entire audience. There were no seats, and I took my station against the left wall, in full view of a fine painting of the Emperor Nicholas, who it seems is a saint in their calendar, and whose picture they appeared to worship quite as much as that of the Saviour. Directly the young priest or student began to read in a Greek Bible in a sort of sing-song manner, which was responded to by a loud voice from an inner room. The door opened, and my old friend the padre made his appearance, talking very loud and making innumerable bows. Meanwhile the bellringer lay prostrate, with his forehead and hands on the floor. This lasted but a minute or so, when the priest, crossing himself, first before the picture of our Saviour, and then before that of the Emperor, laid aside all church business, and came to me with a pleasant smile, his hand extended, and a "Good morning, captain." He then invited me to dine with him, which I did. He is certainly a noble-hearted but simple man, and I have no doubt is thoroughly sincere in his religious belief—made up of mummeries as it may seem to us Protestants. To see him with his long hair knotted behind, a red shirt and black neckerchief, one would not at first sight take him for one of the reverend clergy.

Statistics.—I learned to-day that the inhabitants of this town, which they call Eneah, number 295; at a settlement of Tonguse seven miles to the eastward of this there are 206; another W.N.W. of here numbering 190; in all 691 inhabitants under the pastoral care of my friend the priest, for which he receives 800 dollars per annum from the government.

Numerals.—I have for several days been learning to count ten in Russian. My teacher is a pretty little girl, about eight years of age, the daughter of my host. For future reference I will write it down.

English.	*Russian.*	*English.*	*Russian.*
One	Dras	Six	Shis
Two	Devar	Seven	Chem
Three	Chuc	Eight	Woshan
Four	Chetede	Nine	Gavet
Five	Peah	Ten	Desfey

Six and seven it will be seen are the only words above which bear any resemblance to English in sound.

(To be continued.)

Visit of Prince Alfred to Jerusalem.

On the 17th of March all Jerusalem was thrown into a state of the most pleasant excitement by the news that advices had been received at the English consulate the previous night, announcing the arrival at Jaffa of H.M.S. *Euryalus*, having on board his Royal Highness Prince Alfred, on his way to visit the Holy City. The truth of this was presently confirmed by sundry unmistakeable signs, such as the constant galloping of messengers between the English consulate and the Pacha's residence, by the erection of a second flagstaff over the former, and the passage of rich furniture through the city to the Armenian Patriarch's palace, which, it appeared, the Pacha had decided upon fitting up for his Royal Highness's reception, that he might have his choice between that and the English consulate.

In the afternoon of the 17th, Mr. Finn, the English Consul, attended by his cawasses, left Jerusalem to escort the royal party from Jaffa. The people of Jerusalem were, however, destined to experience a temporary disappointment, for news arrived on Monday that the Prince had not landed so soon as had been expected, and could not reach Jerusalem until Wednesday. On Tuesday it was reported that the Prince would stay at the English consulate, his suite at the now well known Mrs. Rosenthal's hotel—intelligence which comforted the latter not a little, as her excellent house has been almost unvisited during the past year, a circumstance which cannot be attributed to accident. But to return to the royal visit.

On Wednesday morning all was astir—people going out, troops under arms, cannon ready, field-pieces outside the city, the Pacha's pavilion pitched and richly furnished at some distance from the city for the Pacha's reception. At about three o'clock in the afternoon the consular staff of dragomans and cawasses started to meet the procession. From the battlements of the city the sight was picturesque in the extreme: soldiers grouped everywhere, with piled arms, waiting the signal to line the roads; people of every nation and language out waiting in thousands,—most of them had been out all day. The weather was intensely hot, and an East wind blowing. It grew dark, however, and the Prince had not arrived, but at length the roar of the cannon salute announced that the royal visitor was at the Pacha's pavilion, and immediately huge lanterns were dispatched from the English consulate to meet the procession at the city gate. The soldiers lined the street up to the Consul's door, and then the great guns from the fortifications announced that for the first time in the history of the world an English Prince was within the walls of Jerusalem; and amid the din of the multitude and the pealing of the guns, his Royal Highness, accompanied by the Pacha, the English Consul, Captain Tarleton, R.N., Major Cowell, R.E., Dr. Carmichael, &c., rode up to the consular residence, the Turkish infantry presenting arms as the Prince dismounted. The Pacha presently departed, but the next day dined privately with the Prince at the consulate. His Royal

Highness, it appears, declined any public reception of deputations or Consuls, or others.

On Thursday the royal party paid a visit to the Mosque of Omar, at the request of the Pacha, and although it was the last day of the pilgrimage to Neby Moosa, when all the fanatics of the country are assembled, and the mosque enclosure was full of men, women, and children, not an uncivil word was spoken to any one.

On Friday, 23rd, a lovely morning, the whole party set out for Hebron. First the cawasses, then the Prince, the English Consul and his lady, Major Cowell, &c.. escorted by a body of infantry, mounted as body-guard, and last of all a party of irregular horse for honour. It was a very pretty sight indeed. In front were two of the cavalry drummers, fellows in the most original costume with conical felt caps, beating the little kettle drums at their saddle-bows with leathern straps, making the valleys ring again.

At Nar Elias the Greeks of the convent had laid down carpets and placed an arm chair for the Prince, under the olive trees where there is a view on the right hand of Bethlehem, and on the left of Jerusalem. The convent bell was rung famously, and a crowd of Greek and Russian pilgrims were gathered to see the Prince.

But at Bethlehem his reception presented a most wonderful and interesting sight. The whole population, in their picturesque dresses, turned out to see and welcome his Royal Highness, and his numerous cavalcade rode through a crowd of eager people, men in their red and white turbans, with holiday robes of scarlet cloth, women and girls in dark blue and red, with gold coins on their heads, and bracelets of gold and silver on their arms, on every terrace and roof, and many a prayer of "God preserve him to his mother," or "God lengthen his days," was heard in an audible voice by the bystanders in their vernacular Arabic. One man even ran forward and spread his garments in the way, but the Prince, with delightful tact, turned his horse aside, so as to avoid treading on them. As the party proceeded the mass of people followed, so that when it reached the Church of the Nativity, the fine open space in front of it was thronged. Here the party were met by the Latin, Greek, and Armenian monks, bearing huge lighted wax tapers. All the places of interest, including the Grotto of the Nativity and the dwelling place of Jerome, were duly visited.

After resting for a short time, and accepting the hospitality of the Latin Superior, the party proceeded to Urtas, supposed to be the site of Solomon's gardens, and now the industrial farm belonging to the Jerusalem Agricultural Association and to Mr. Meshullam, who resides on the spot. On the hill side the Sheik and people of Urtas met the party, and, with their long guns, fired a *feu de joie*, to the great amusement of the royal party.

Mr. Meshullam had the Union Jack flying over his house, and had the honour of entertaining the party at breakfast. The visitors were so much pleased with the place and their reception that they expressed their intention of returning thither on their way back next day.

Hence they went towards Solomon's Pools, the goldfinches pouring

forth their song from every branch and thicket. These pools are splendid pieces of water, the largest, as was observed by one of the party, capable of accommodating two first-rates. At Hebron the troops were drawn out, and, after the Colonel had paid his respects, the party moved on—not to the town, but westwards to the great oak, called Abraham's oak, where tents were pitched in readiness. Presently a pack of jackals began to cry among the vineyards, and their voices had hardly ceased when the plaintive cry of the plover was heard, and then came the barking of a fox, the hooting of an owl with a voice like a bell, and all other sounds special to an encampment.

Next morning the party returned to Jerusalem by a different road, first visiting the unfinished building called Abraham's house, supposed to have been begun by David before removing to Zion. The doorway is 176 feet wide, and all of Jewish style of building. Shortly before reaching Urtas a hare was started, and a brisk but unsuccessful chase ensued. At Urtas dinner had been prepared by Mr. Meshullam, and the butter, honey, and Bethlehem wine were much approved. After dinner the line of march was resumed, and Jerusalem re-entered after dark.

Next day the whole party attended divine service at the English church on Mount Zion, where the Bishop preached, and the church was filled with pilgrims and strangers then sojourning in Jerusalem—even some of the Turkish guard ventured in. In crossing the square of the castle opposite the church gateway the guard turned out to salute, and on leaving the church the Prince was received by a dense crowd, chiefly Armenian pilgrims, desirous to see the Queen of England's son, and on his way back honoured the Bishop by returning his call.

On Monday, the 28th, his Royal Highness left Jerusalem for the Dead Sea. As soon as the sun was risen crowds assembled to see him depart, and the terraces and domes of the houses were covered with spectators. The troops lined the street, and when his Royal Highness left the consulate the castle guns fired a salute of twenty-one guns, and another when he passed out of the St. Stephen's Gate. At the Garden of Gethsemane the heads of the Armenian and Greek churches were waiting to take leave of the Prince, who proceeded then to the Dead Sea, and thence by Bethel to Damascus.

It will be gratifying to the people of England to know that his Royal Highness was in excellent health and spirits, and charmed all the world by his unaffected courtesy as well as his dignity and manly English bearing. Many a one responded a hearty Amen to the prayers which the people of Bethlehem uttered so loudly for his long life and happiness.

The following is an account given to his friends by a young naval officer after having gone over much of the same ground as that alluded to in the foregoing,—creditable to the author as well as to the school which he had not left long for a naval life.

I did go to Jerusalem, and, as you may imagine, enjoyed the trip very much. I remember, when at home, reading little pieces of *Naomi*, I used to think that I would rather see Jerusalem than any other place in the world. Now that my wishes have been realized, I do not feel the least disappointed. But of course I must begin with an account of the journey there and tell you everything we saw. A company of us went, fourteen in number.

The first day we passed through a place called Ramlek, which is the ancient Arimathea, where we had lunch; this done, we resumed our journey and could see Lydda, not very far off. The first night we slept in a tent, which was brought by our guide. The next morning we started off again shortly after sunrise. That day we rode through the valley in which David killed Goliath, and saw the brook from which he chose the pebble to kill him with. I think it must have been about three o'clock in the afternoon when we came within sight of Jerusalem.

You cannot see the town until you are within a mile or two of it on account of the country being very mountainous and hilly round it. I cannot tell you how I felt when I first saw it and thought of everything that had happened there. All round it the country is most barren; in fact, the whole land of Palestine is, as it was prophesied to be, barren. Nothing but rocks and sands, with here and there a few olive and fig trees. But in the midst of all this Jerusalem was still very fine, with its turreted walls and here and there some green trees, adding of course to its beauty. I should have liked very much to have had a sketch of it, but we were all so tired with riding that none of us dreamed of stopping, and were most anxious to get to a place which our guide called the Hotel.

Inside the town Jerusalem is nothing now but just like all other Turkish towns, with narrow dirty streets, very badly paved. However, I had read all this before we started, and was therefore not disappointed. A great many people have an idea that it is a very beautiful city. Of course it was once, but now it is, as I said, nothing but a dirty Turkish town.

Before entering the town we could see the Turkish burial ground. There were at least four or five people being buried at the same time. Round each of the graves we could see women standing dressed in white. I suppose they were the mourners. On finding ourselves in the city, we were all glad to get some dinner, and a good night's rest, all ready to go sight-seeing in the morning. Of course the first place we went to see the next day was Mount Calvary; I must first tell you that the present town has included it, so that it is quite inside the town now. I cannot imagine how it ever obtained the name of a mountain, as it is only a small elevation of the ground hardly worthy to be called a hill. There stands on it a church, now called the Holy Sepulchre, the inside of which is very beautiful. Of course they show you all kinds of absurdities as well as the real places themselves. The place where our Saviour was crucified is certainly well worth seeing. There is a magnificent painting of the Saviour on the cross just over

the place, and with all the tapers burning round it: at first sight it may easily be mistaken for reality. They even go so far as to show the place where the cross was fixed in the ground, and also a large rent in the rock, which they say was caused by the earthquake which took place at his death.

Not very far from Calvary they show you the tomb of the Saviour. Of course it may be the right place, and it may not. All round it we saw men and women, Turkish, Arabian, Greek, in fact, almost all nations, bowing down to the floor and kissing it. In a part of the Holy Sepulchre they have two old marble pillars, which are shown as being the only remnants of the ancient Temple. We visited the Holy Sepulchre quite early in the morning.

After breakfast we rode out of the town to see all that was to be seen there. The first place was the Tombs of the Kings, where all the old Kings are said to have been buried. The entrance is very small indeed, you can only just crawl in on your hands and knees. The tombs are certainly beautifully made, for there are rooms (if I may so call them) here and there, with places for the bodies all round. Every one of these rooms is exactly square, and the sides and ceiling as flat as possible; if you look along them you cannot see the slightest inequality of surface projecting beyond the other part any where, and of course when you consider the hundreds of years the tombs have been there, this is very wonderful. If you stamp your foot anywhere on the ground, it sounds as if it were hollow underneath. We did not attempt to go very far into them, but just had a good look and came out again: it would be easy enough to lose yourself in them, especially if the light happened to go out.

From the Tombs of the Kings we went to the valley of Jehoshaphat. Here is the garden of Gethsemane. It is just between the Mount of Olives and Jerusalem. They show the place which the Saviour most frequented and also where he suffered his agony enclosed by a wall, and they also show the place here where he was betrayed and seized. It is between the garden of Gethsemane and Jerusalem. I cannot tell you how I felt when I was walking in the garden and thinking that the Saviour had also walked there.

We saw also the tomb of the Virgin Mary and that of the prophet Jeremiah, and dozens of other places which I cannot remember. Of course we went up to the top of the Mount of Olives. On the very summit they point out a place from which the Saviour is said to have ascended into Heaven. There is an impression in the rock very much the shape of a man's foot, and this they are absurd enough to say was caused by our Saviour as he sprang off the ground.

From the Mount of Olives the view of Jerusalem is certainly most beautiful; you can see all over the whole city, and when standing there I could not help thinking of the sentence which the Saviour pronounced as he looked at the city in the same way as I did then, viz.:—"Oh! Jerusalem, Jerusalem," &c. Again, if you look the other way, you can see the Dead Sea and the mountains of Moab at the other side of it.

After we had seen all there was to be seen about Jerusalem, we went to Bethlehem (by the bye, I must not forget to tell you I had a drink out of the Pool of Siloam). At Bethlehem we of course went to see the place where our Saviour was born. There is of course a church built over this place, like every other where anything has happened in the Holy Land. From Bethlehem we went to the Dead Sea, the water is certainly very salt, I just dipped my finger and touched my tongue with it. It is so salt and bitter that it may almost be said to burn you. We then went to the Jordan, and most of us bathed in it, all of us drinking as much as we could, for it was the only fresh water we had met with the whole of the day. Then we went back to Jerusalem and from thence on board ship again.

At one place outside Beyrout there are groves of pines only about twenty feet in height, and with bare straight stems for about fifteen feet up, when they all shoot out, making a regular ceiling, and of course a beautiful shady place for either walking or riding.

Nautical Notices.

Particulars of Lights Recently Established.

(Continued from page 220.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
13. Cape S. Croce	E. C. Sicily	37° 15·3′ N., 15° 15′ E.	F.	91	14	Est. 1st May, '59.
P. Augusta	Ditto	37° 9·8′ N., 15° 15′ E.	F.	49	10	Est. 1st May, '59. On Magnisi Peninsula. A green light.
14. Pt. Caprara	Asinara I.	41° 8′ N., 8° 18′ E.	F.	262	25	Est. 1st April, '59.

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

Lighthouse at Kawaihae, *Sandwich Islands*.—The first lighthouse ever erected at these islands is soon to be constructed at Kawaihae, by private capital alone, by the enterprising firm of G. W. Macy and Co. In addition to this important work, designed solely to serve the interests of whalers visiting that port, the above firm have also a railway of a hundred or more feet in length, with cars and every facility for landing and taking off freight. The erection of a lighthouse will add to the safety of vessels visiting that port for recruits. By the by, what has become of that plan of putting up a lighthouse at Lahaina, about which we heard so much some months ago?

Pacific Commercial Advertiser.

MINTO REEF.—*Pacific.*

We find the following in the *Shipping Gazette* of 28th January:—

The American ship *Mildman*, from Sydney reports that on Tuesday, November 30th, 1h. p.m., made a reef not laid down in the chart of Indian Pacific Ocean (published by Charles Wilson, No. 157, Leadenhall-street, London, 1850, with additions to 1854). Saw a large ship, apparently a clipper, on shore on the West side of the reef. Passed to the westward of it. Saw a schooner also, with nothing visible but the two masts sticking up. The ship lay well up on the reef,—foremast, top, and topgallant mast standing, and main and mizen gone. Sent the boat to the ship, and on approaching the reef as near as the surf would permit, could see no appearance of life on board. Captain Webb writes,—"I made the western part of the reef long. 154° 29′ E., lat. 8° 8′. Horsburgh notes a reef, and calls it 'Dangerous Reef,' and says it bears W.S.W. from Bordelaise 14 miles, and Puto, in lat. 7° 36′ N., long. 155° 18′ E.; but if Bordelaise is laid down rightly, the western part bears N.W. 57 miles from that island. This reef may be the so-called Dangerous Reef of Horsburgh's chart."

[By the chart this is evidently Minto Reef.—ED.]

LIST OF CHARTS *Published and Corrected by the Hydrographic Office, Admiralty, in April,* 1859.

Ireland, North coast, Lough Foyle, Mr. R. Hoskyn, R.N., 1854, (3s.)

France, West coast, Les Sept Iles to Ile D'Ouessant, Pilote Francais, 1823, (3s.)

France, West coast, Ile D'Ouessant to Raz de Sein, Pilote Francais, 1822, (2s.)

France, West coast, Raz de Sein to Ile de Groix, Pilote Francais, 1823, (3s.)

Nova Scotia, Bryer Island to Gulliver Hole, including St. Mary Bay, Comdr. Shortland, R.N., 1855, (3s.)

East Indies, Java Sea, Western part, Dutch surveys, (3s.)

China, Pei-ho River, from the entrance to Tien-sin, Mr. A. E. Ploix, French I. N., 1858, 2 sheets, (2s. each).

Japan, Simoda Harbour, with views, Lieut. Maury, U.S.N., 1854, (2s.)

Japan, Yedo Bay and Harbour, with views, Lieut. Maury, U.S.N., 1854, (3s.)

Australia, East coast, Moreton Bay, corrected to 1859, (1s. 6d.)

Books.

Sound of Harris Sailing Directions, Capt. Otter, R.N., 1859, (1s.)

Australian Directory, vol. 2, East coast, Torres Strait, and Coral Sea, compiled by C. B. Yule, Esq., Comdr. R.N., 1858, (3s. 6d.)

Hydrographic Notice, Australia, East coast, Moreton Bay, "Smith Rock," a new discovery, light-vessel discontinued, with position of dangers in the Coral Sea.

Report of the Royal Commissioners for Manning the Navy.

The following are the heads of the recommendations contained in the report of the Royal Commissioners:—

Perseverance in the system of continuous service. A large ship, similar to the *Britannia*, capable of affording accommodation to 500 boys, to be placed at Plymouth; and four additional training vessels, which would enable boys required for the Navy to receive the same instructions.

A reserve of seamen in the home ports, ready to complete the crews of ships put in commission, for the relief of foreign stations. It should not be less than 4,000, besides those retained in the harbour guard-ships. A period of five years' service as seamen-gunners to count as six years towards a long service pension, the pension to be payable to them only in the United Kingdom and Channel Islands. Of the 4,000 men retained in the home ports, 1,000 to be seamen-gunners.

The Commissioners advise improvements in the internal arrangements of the hulks in which the men are lodged whilst their ships are fitting out. Increase of the allowance of both bread and salt meat to one pound and a quarter daily (the rate of payment for savings, however, to be diminished). Bedding and mess utensils to be issued as the hammocks now are, and a suit of clothes given to every man, on his first entering for ten years' continuous service. Other recommendations of the Commissioners relate to the payment of wages whilst the ship is fitting out; the system of allotments, the badge money, the rank and promotion of warrant officers. The Commissioners recommend the restoration of pensions retrospectively to the widows of warrant officers, and anticipate the best results from "the occasional promotion of a warrant officer to the quarter-deck, for distinguished service, combined with exemplary conduct; and that it should not be limited to the warrant officers, but should be open, in the case of very signal and extraordinary services, to any seaman in your Majesty's Navy."

The second point to which the attention of the Commissioners was directed, is the mode of manning the Fleet on an emergency. Not less than 20,000 such men, most suitable for the purpose, to be selected. It is proposed to call them the "Royal Naval Volunteers." The inducements to join this force will be:—1. A payment of £5 a year at short periods. 2. A pension at the age of 50 to 55. 3. Payment for time spent in practice. 4. Admission to the Coast Guard. 5. Participation in the benefits of Greenwich Hospital. On their part they would engage to practice gunnery, and to serve in case of emergency; and conditions would be framed to secure their coming forward to join the Navy within a very short time after their services were required. They recommend the establishment of school ships in the principal commercial ports, capable of accommodating from 100 to 200 boarders in each ship, of whom 100 should be supported by the state, for its future supply; open to all children residing at the ports as day scho-

lars contributing weekly. The full amount contemplated for those forces respectively, before the Commission was issued, and the additions which they have recommended would be:—

Reliefs in the home ports	4,000	
Coast Guard	12,000	
Marines embodied	6,000	
Ditto short service Pensioners	5,000	
Seamen, short service Pensioners, say	3,000	
		30,000
Royal Naval Volunteers	20,000	
Naval Coast Volunteers	10,000	
		30,000
Making in all		60,000 men.

The Commissioners estimate the whole expense of the additions as follows:—

Improvements in the Peace Establishment.		
Increased allowances of provisions	£42,331	
Pensions of Warrant Officers' Widows	19,150	
Mess utensils, clothes, and bedding	14,200	
Instruction and training ships	15,918	
Petty Officers' badges	6,833	
Pay and pensions for gunnery	6,289	
		£104,671
Additional Reserves in the Queen's Service.		
2,000 additional Coast Guard men	£116,525	
4,000 reliefs in home ports	132,000	
5,000 short service Pensioners, Marines	45,625	
In the Merchant Service.		
20,000 Royal Naval Volunteers in home and 5,000 in distant voyages (including school ships)	200,000	
		£494,150
Making in all		£598,821

The report is dated the 19th of March, and is signed by the Earl of Hardwicke, the Marquis of Chandos, the Right Hon. E. Cardwell, M.P., Admiral W. F. Martin, Sir J. D. Elphinstone, Admiral John Shepherd, and Mr. R. Green.

LOSS OF H.M. GUNBOAT "JASEUR" *on the Baxo Nuevo, on her way to Greytown from Port Royal.*

Charles Leggatt, late quartermaster of the *Jaseur*, said—I had charge of the watch on the afternoon of the 26th of February. We were steering S.S.W.½W., and the vessel was sailing about 5½ knots an hour, when I relieved the deck. I heaved the log during my

watch, using both the patent and common log. There was no land in sight. The force of wind at the time was between 6 and 7 during my first watch, and the rate of the ship was 6½ knots. We were under all plain sail, with the exception of a flying jib. The wind was about E.N.E. It was very dark at the time, and the weather thickened as the breeze freshened. There was also a heavy sea. I think I could have seen breakers about ninety yards off. The orders I received at eight o'clock were to keep a good look out, as we had to pass two very dangerous reefs. I went forward there and ordered the look-out man to keep a very good look out, and I visited him frequently afterwards during the watch. I saw the commander and master on deck during the first watch. I first observed breakers about a quarter past ten o'clock p.m. I saw them first. The look-out man was awake. I did not attribute any want of diligence to him, considering the state of the weather at the time. On observing the breakers I reported the fact to the master, who was on deck immediately, and ordered me to pipe "watch about ship." I put the helm down, and "piped watch" accordingly. The vessel did not "stay," but made a stern board, and struck with the stern way on her. I attribute her missing stays to the fact that she came up head to the wind, and the sea was too heavy for her to come round. About three minutes elapsed from the time I saw the breakers till the ship struck. We lowered the boats, cut away the masts, and began to provide ourselves provisions and water during the night. The sea was breaking over the vessel at the time very heavily. We left her about eight o'clock on the morning of the 27th. She was then on her broadside and breaking up fast, the decks bursting up, and full of water. Nothing more could have been done for the salvation of the ship and her stores than was done by the commander and officers.

The court was of opinion that the loss of the *Jaseur* was occasioned by an extraordinary set of the current, experienced from noon till the ship struck, on the date of the accident; that everything was done that was possible to save the vessel, and that no blame was attributable to Lieutenant Scott for the loss of the gunboat or for his conduct on the occasion, and he was therefore acquitted.

The court could not close its proceedings without recording its approbation of the discipline and good conduct maintained by the officers and ship's company of the gunboat throughout all the trying circumstances in which they were placed after the wreck, and of the judgment and seamanship displayed, which was highly honourable to all, and particularly so to Mr. Moss, the second master, and to Mr. Fullerton, the gunner, who had charge of the boats when Lieutenant Scott became insensible. The court strongly recommended those two officers to the favourable consideration of the Admiralty.

Wreck of the St. Paul and Massacre of her Passengers.

This vessel left Hong Kong for Sydney, with 327 Chinese passengers, and on the night of the 30th September was totally wrecked on the Island of Rossel. Captain Pennard, master, and eight of his crew left the island in one of the boats, to endeavour to make the land and obtain assistance, and were picked up by the *Prince of Denmark*, schooner, on the 15th of October, inside Sir Everard Home Group, and conveyed to New Caledonia.

Immediately on learning the news of the disaster, the authorities at New Caledonia dispatched the French steamer *Styx* to ascertain the fate of those left on the island. The *Styx* returned on the 25th of January, having left Rossel on the 8th, and brings the horrifying intelligence that the whole of the passengers and remainder of the crew had been killed by the natives, with the exception of one Chinese, who has been brought on to Sydney. This individual furnished the *Sydney Morning Herald* with the following account, through the medium of an interpreter:—

The ship went on shore during the night, and when she struck the passengers all rushed on deck, making a great outcry, upon which the captain drove them below. When daylight broke, we landed, by means of the boats, on an island, where we remained two days without water, when some of us went on board the ship again to get some, as also provisions. The captain left in his boat with some of the crew, and we were not disturbed by the natives for a month after he was gone. They then came over from the mainland, distant about three-quarters of a mile, and made an attack on us. Some of us had double-barrelled carbines, but we got frightened and threw them away. The only white man left with us, after the departure of Captain Pennard, was a Greek, who, having armed himself with a cutlass, fought desperately, and killed a great many of the natives before he was overpowered. They then took all our clothing. &c., which they partly destroyed. Any valuables that they found, such as sovereigns, rings, &c., they placed in a net bag, which each man carried round his neck. A watch particularly excited their attention, as they were continually opening it to observe the reflection of their faces in the glass.

At night we were placed in the centre of a clear piece of ground, and fires lit in several places, the natives keeping a regular watch over us, and during the day they would select four or five Chinese, and after killing them, roast the flesh and eat it; what was not consumed being deposited in their nets. On one occasion some of the Chinese took a boat which belonged to the ship, and went over to the mainland to get some water, but never returned, so we thought they were killed. When I left there were only four Chinese and the Greek alive, all the rest having been killed. I saw these five the day the steamer came in sight, but when the natives saw the boats coming on shore, they took them up the mountains. I was sick and lame, and they would not carry me, so I watched my opportunity and contrived to conceal myself among the rocks until the boat came on shore.

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

JUNE, 1859.

Second Cruize of the "Morning Star," *Capt. J. W. Brown, among the Mulgrave Islands—Refuge Cove—Arrowsmith Island—Bougham Group—Massacre of the Captain and Crew of an English Vessel in* 1852*—Effect of Eating a Poisonous Fish—Passed Lai Group—Scantz Island has a wrong Position assigned on Charts—Bigini Group.*

A busy little vessel engaged in doing good among the numerous tribes of people who are "walking in darkness" on the coral islands of the Pacific Ocean, has returned from her second trip to her rendezvous in the Sandwich Islands. Her first voyage, under her former commander, S. G. Moore, appears in our last volume, and it is gratifying to observe that her reception by the natives, along with the excellent missionary spirits whom she conveys, is just what can be desired. We have here, however, to do with the results of the hydrographical labours of her commander, which are directed to the improvement of the charts in a manner highly creditable to him; and we shall look for the fruits of these visits in a chart of that ill known group of the Ralick and Radack chains, which appear to be included in the general name of Micronesia.

On the 13th sailed for the Mulgrave Islands, where we arrived the evening of the 17th.. Stood close in shore. At 10h. p.m., with a bright moon; having fine weather, we lay by so near the snow-white beach that we could hear the shouts of the natives, and even distinctly hear them talking with each other. Fires were lighted, and soon a large canoe was seen sailing toward us. She came alongside,

and two men came on board, staying till about midnight, when we sent them on shore, telling them to come off in the morning, which they failed not to do. We found a fine ship-channel on the North shore of the group, and entered the beautiful lagoon in a fresh gale and squally weather, on Sunday, November 21st, and, after shying about among the coral reefs, I discovered from aloft a small cove under a beautiful island, called by the natives Chabbunwuni. We ran in between the outer reefs and came to anchor, finding it a fine and secure place, which I have named Refuge Cove. We were all very glad to avail ourselves of its shelter after knocking about outside for several days and nights in stormy weather. Natives soon came off; but on being told it was Sunday and desired to return on shore, they readily complied.

The average height of the islands of this group does not exceed five feet above high water mark, and they are only a few rods in width,—say five minutes' walk. They are very beautiful, and many of them abound with breadfruit, cocoanut, pandanus, and other trees. The bottom everywhere is coral; at our anchorage the water was from 10 to 15 fathoms, and 25 fathoms was the deepest found in mid lagoon. A vessel entering this lagoon must depend entirely upon her weight of metal, as such a thing as holding-ground cannot be found. Our own is very heavy, and the *Morning Star* has not yet, on this voyage, started an anchor with a proper scope of cable.

The king, chiefs, and people of Milli were greatly rejoiced at our visit, and wished Mr. Doane to stay with them. They are very anxious to have a missionary among them, and it is to be hoped their wishes can be complied with. The king gave me a very beautiful island, and said, if I would come and live on it, he would have me a nice house built, and give me more land. They related to us some particulars concerning the *Globe* mutineers, and showed us where the ship was anchored, which was outside, very close to the shore, in a very exposed position, although, as is known, she escaped.

Mr. Doane cruised among the various islands in a large canoe belonging to the king, accompanied by him, in order to ascertain the number of inhabitants. He thinks 600 the extent at the time of our visit. The N.E. Trades were just setting in, and we had the wind most of the time very strong, with squally and rainy weather. There are four deep-water channels, all on the North shores. One of them is a mile in width. The South point of the group is in lat. 5° 58′ N., long. 172° 2′ 30″ E.; its northern extreme lat. 6° 20′ N., long. 171° 45′ E. In the central part of the lagoon are three small shoals, on which are breakers,—no other danger exists. [The position of the Mulgrave Islands as well as that of Arrowsmith or Maturo, called Meduro (subsequently given) on the chart, agrees very well with these found,—the northern part of Mulgrave Reef being rather too far North.]

We left Milli or Mulgrave Island on the 29th of November for Arrowsmith Island—called Maturo by the natives—and arrived next day. Sailed close along its southern shore. About its eastern point

the land is broken, and a canoe came out of a small opening; but soon we found it continuous and unbroken for twenty-four miles, the reef and chain of islets being to the North. It is a magnificent island. The ground where Mr. Doane and myself landed is from six to ten feet high. It has elegant forests of breadfruit and pandanus trees. Cocoanuts of course abound, bananas also seem to be plentiful. We walked across the island to the lagoon side, escorted by 300 to 400 natives—men, women, and children. They appeared to be filled with wonder and delight. On the shore of the lagoon the sight was most delightful; about twenty large canoes lay upon the beach. We made the chiefs some presents.

We left the island on the evening of December 1st for Bougham Group; arrived and entered its lagoon on the next day, anchoring under an island called Imurott, [the name does not appear on the chart,] near the spot where, five years since, a trading schooner was cut off. Capt. M'Kenzie and all hands, save one, were killed. The one saved is a native of Manila, and is now with me. The vessel anchored the day before the massacre. The captain was carried ashore from his boat on the back of a native, and the schooner lay very close to shore. A native with a hatchet cut the captain's head nearly off, which was the signal for those on board to commence the work of death. Many natives being on board, soon all of the crew were dead, except the abovementioned. He was at work aloft: the natives went up after him, but he, monkey-like, flew from one mast to another, from one rope to another, until finally the chief called out, "That is my boy, spare him." They robbed, burned, and sunk the schooner; and we have on board one of her anchors and a piece of one of her cables. The natives took Mr. Doane and myself, in the dusk of the evening, to the spot where the captain fell; also showed us the anchor, which lay under a cocoanut-tree, and from which they had the palms broken. Next day they directed us to the sunken wreck,—her copper appears bright and clean as ever,—her draft mark "5" upon her stern could be distinctly seen,—her cable I found entangled among the coral, so that only a small part could be saved. Pieces of charred plank we found about the beach.

The Bougham Group, or Chelnitt of the natives, is full forty miles North and South. Its South point is in lat. 5° 47′ N., long. 169° 36′ E. In width it will average about eight miles. Its form is irregular. The various islands are very beautiful, and abound with the same fruits as the Mulgrave Group. At our visit, breadfruit was out of season, and at such times cocoanuts and pandanus constitute their only food. The people number from 300 to 400 only. More shoals were found in this lagoon than in any we have seen. They are large and numerous; a vessel could hardly remain under way in the night without striking on them. They are composed of very sharp and hard coral, and we narrowly escaped once in the daytime,—though we constantly kept a look-out aloft. [This group is represented on the chart by the names of Kyli or Bonham, Coquille, and Elizabeth

Islands,—and although agreeing pretty well in longitude is only half its extent in latitude.]

Leaving our anchorage at 1h. p.m., December 8th, for the purpose of examining the N.W. shores, as usual in getting under way I placed my son at the wheel. Very soon he desired to leave, saying he felt sick, and that his head felt numb; sure enough, said I, and mine is feeling the same way. I then thought of a beautiful red fish we had eaten for dinner. The unpleasant sensation increasing, I spoke of it to my officers, and found them troubled in the same way. A squall came upon us very suddenly while we were wondering at our very strange sensations, which threw the vessel upon her bearing. I had seen it coming, and was taking in sail, but it burst on us with great fury, tacks, sheets, and sails gave way or we should have fared worse. The rain fell fast, and we were very near to one of these shoals,—which side of it we went I could not tell. My tongue I found was in a measure paralysed, and my officers, as well as myself, staggered about the decks. The squall lasted about half an hour, when we set our crippled sails, and made for a harbour, reaching it before night. It took us all night to get right again from the effects of the fish.

Finishing our work here, we left for Ebon on the 13th of December, and arrived next morning. The Trades blowing very strong, with very squally and rainy weather, we could not enter the lagoon, as there is only one channel, which is very small, and on the S.W. part of the group.

We left Ebon on the 16th; touched at Navarik on the 17th. Had an interview with its chief—a fine fellow I saw at Ebon on my former visit—made him some presents, and left in half an hour.

Sunday morning the 19th, was surprised at seeing land very near a-head, as none is shown in my charts in that place. On coming up with it, found it to be a group of fourteen islands, encircling three sides of a beautiful lagoon, the western part being protected by a reef with a small channel. A canoe came off, having two men on board. I gave them some presents, asked the name of the group, which is Lai or Rai, and left this little gem, the lagoon of which is about four miles across, and lies in North latitude 9° 0′, and East longitude 166° 26′. The canoe brought off some very fine breadfruit and cocoanuts.

Continuing our course, we passed over the assigned position of Scantz Island in the night, with a bright full moon, and a sharp look-out; but nothing was seen. Next day we came up with an island named by the charts Eschscholtz Island. At noon we were close in-shore, in lat. 11° 33′ N., long. 165° 37′ E. Could see twelve islands lying in an East and West direction. We being about the centre, stood for a channel three miles in width between two islands. On getting near, we could see the bottom stretching across; sent a boat to sound, found 11 fathoms, and sailed over, seeing very distinctly the various coloured corals comprising the reef under our keel as we dashed along. After passing this bar, found onrselves in smooth water; soon after saw land in the N.W. and also in the N.E., also a shoal with 10

fathoms water over it,—of course I was now convinced that we had entered a spacious lagoon. I counted from aloft fourteen islands, and the lagoon must be twenty miles across at least. We tacked and stood out, speaking a canoe on our way, with a chief on board, who informed us that the name of the group was Bigini. We cleared the western extremity at sunset, which is a circular reef. This part is very dangerous, as all the adjoining islets are small and very low, some of them having only a few bushes. I noticed one peculiarity in this group; the bars between the islands and shoals inside are more sunken than any we have seen heretofore, with several deep channels into the lagoon. The canoe followed us for some time after we had left the lagoon, and only gave up the chase when we made all sail away from them. They were extremely anxious to get on board, and I very much regretted that time and the state of the weather would not admit of a short stay. They are a very fine race of people if those in the canoe were a fair specimen.

[It does not appear on the chart; but about twenty miles West of it is a small chain called Lileb or Lydia. Nothing, in fact, can be more unsatisfactory than the state of the charts of this part,—rendering it dangerous for any ship to venture among the islands.]

Although the Lai Group has no place on my charts, it can, no doubt, be found on some others, although the Ralick and Radack chains have been but imperfectly surveyed. The island supposed to have been discovered by my predecessor last year, can be found on the old charts of Norie, and is called Princessa Island. The South channel also of the Apian Lagoon is distinctly marked in the very excellent charts of the King's Mill Group by Commodore Wilkes. Standing to the North, we passed over the given position of Halcyon Island, and saw nothing.

January 8th, lat. 31° 0′ N., long. 174° 42′ E., took a heavy gale from S.W., which brought the packet down to straight jacket for sixteen hours. 13th, lat. 31° 33′ N., long. 174° 20′ W., experienced another gale, heavier than the first, from the southward; was hove to also in this sixteen hours, under a storm trysail. 18th, took a third gale, nearly as hard as both the former, the wind W.N.W.; we scud E.S.E. under a close reefed topsail and storm trysail, and finally reefed foresail, for thirty-six hours, our decks drenched fore and aft. During this gale we had very heavy squalls and much lightning, with a very heavy sea running, but the packet behaved very well. Our passage thus far has been a very boisterous one, if I except six days of calm and doldrums.

When standing to the North in the Trades, they were very strong and very squally, frequently bringing us down to a close reef, and once furled our fore-topsail. Through it all the *Morning Star* has proved herself an able boat in all sorts of weather.

In speaking of Arrowsmith Island, I forgot to mention the fact that I found it placed in both my charts (Blunt's and Imray's) twelve miles South of its true position. Its western point lies in lat. 7° 15′ N., long. 171° 0′ E. In all the lagoons I found high water at full

and change of the moon to take place at half past three, with a rise of five feet,—neap tides not over two feet. Their seaward shores are bold and steep, having no outstanding dangers.

On our arrival at the Mulgraves, we attempted to enter the lagoon by a narrow channel, which we supposed was the only one, and through which a ship cannot pass inward while the Trades are blowing; working as near as possible, we anchored on the coral shelf, awaiting a chance to enter. I knew the tide was running flood at the time, and rising on the shore, but found it running out of the lagoon at the rate of three knots; this ran for nine hours, and we dragged off the shelf at sunset, leaving the tide running out still three and a half knots. This passage is in part to leeward, and when, afterwards, we found three deep channels to windward, into which the Trade winds were pouring its waters, we did not wonder at the pouring out to leeward. They have no bananas at Mulgrave, so we left some very nice plants.

The people of the Radack and Ralick chains are great seamen, as well as navigators, frequently making voyages of hundreds of miles in their frail canoes, with their lumbering outriggers, the whole of the fastening being but small cord, made of cocoanut husk. Strongs and Ascension islanders are keepers at home. We were at Strongs Island when the death of the king took place. I was present at the burial, and also at the ceremonies attending the coronation of the new king. A more perfect scene of heathen mummery can hardly be imagined. The days of the Strongs islanders seem to be numbered,—only 800 remain. They are very pleasant and agreeable in their intercourse with strangers, as are also the people of Ebon and Mulgrave. The people of the Kingsmill Group, on the contrary, are of a rather morose turn.

We have now been for three days running in a N.E. gale, under close-reefed sails, and everything and everybody well wet down,—from Lady Faith to the man at the wheel. The qualities of the *Morning Star* have been well tried on this passage, and I think a more able and well-behaved vessel of her class in heavy weather is not yet built.

Sunday, 23rd, 1h. p.m., I am happy to say we have just raised the land, the central part of Molokai. Well buffeted we have been ever since the last Sabbath. Last night it blew a heavy gale all night, bringing us down to storm sails only. But the voyage seems to be winding up, and I will also wind up this, and

I remain, &c.

JNO. W. BROWN.

P.S.—I will merely add that we saw Oahu at half-past two p.m., and let go our anchor a quarter to seven in 12 fathoms water,—Diamond Head E.b.S., one and a half mile, which is the thirty-first time our anchor has been dropped on this voyage.

N.B.—With regard to carrying arms in the *Morning Star*, I can only say I am more opposed to the measure than ever. The boarding

netting is, in my opinion, perfectly useless. I have used a part of it as a quarter netting to keep the children from falling overboard. I have cruised among the New Hebrides, Solomon Archipelago, New Ireland, the Louisiade Archipelago, and other parts, the natives of which are thought to be savage in the extreme; yet I have landed on all these, entirely unprotected, and always received the kindest treatment. Treat them with kindness, and it is all that is required to insure their friendship. True, the natives of Sydenham did not treat Captain Spencer with very much courtesy; but they had a leader not of their own race.

[In concluding this interesting and useful paper, we hope to have further acquaintance with the *Morning Star* and her doings. And we shall continue to look for a chart resulting from her voyages to that interesting chain of islands which appear to excite the attention of the philanthropic committee regulating her proceedings. We shall then know whether the Schanz group exists,—whether the Lai and the Lileb Islands are the same, or indeed whether the latter exist. Whether Namarek or Navarik is right; whether this same Namarek is seventy miles N.N.W. from Ebon, as stated by the *Morning Star*, (p. 533, vol. 1858,) for the chart makes it forty miles E.b.N. from it; or whether there is another Namarek in that position. Whether Covell Island is still determined to be forty-five miles out of its position, and indeed what that position really is: and, also, whether Apia, as given by the former voyage of the *Morning Star*, (see p. 530 of our last year's volume,) is in its correct position, making it about one whole degree East of where the chart places it. For all these things we shall be grateful if we can find them correctly stated in a chart from the *Morning Star*.—ED.]

CURRENTS OF THE PACIFIC OCEAN.

As it is important to mariners to be informed of the various belts of currents, their general direction, mean velocity, and extent, in order to avail themselves of them or avoid them when necessary, and as this ocean must be entered from the South, it may be as well to commence our observations with those of its southern portion, considering the whole to be divided by the equator into two parts. We shall begin, therefore, with the

Southern Counter-Current.—The southern counter-current of the South Pacific, which first appears off the South point of Tasmania, runs eastward. It is made up of two streams: one is the warm current of the eastern coast of Australia, and the other the cold current to the southward of that continent,—although the observations

on which this last theory is founded are not so conclusive as those of the former.

This united current flows from West to East along the whole extent of the Pacific, gathering in volume as it approaches the western coast of America. But in about 160° W. long. it separates into two branches. The northern branch, continuing to flow E.N.E. and East as far as the meridian of 80° W., then suddenly turning round North, N.W., and W.N.W., has received the name of the Mentor Current, and mingles with the southern part of the equatorial current, flowing West.

The other branch of this eastern current, formed mostly by the waters of a lower temperature, flows in part to the northward along the West coast of America, where it forms the cold current of the coast of Peru, called also Humboldt's Current; the other part sets to the southward along the southern coast of South America, where it forms the cold current of Cape Horn, taking its course round this cape into the Atlantic Ocean.

The foregoing is considered the southern counter-current of the Pacific ocean. The observations, however, on which it is assumed are not yet sufficient to establish that it does so beyond question, but only seem to indicate it as most probable.

The southern limit of this current, according to the same theory, will be difficult to establish, from the tendency of the cold water to flow towards the equator. But from the combined tendency of the waters to flow from the southward towards the equator with those flowing from West to East, a mean variable direction results, according to the relative strength of these currents.

There is little information concerning the temperature of this counter-current, but it appears that on the parallel of 60° S. lat. the mean temperature was found to be 33°; in 50° lat., 36°; in 45° lat., 43°; in 35° lat., 65°.

The rate of this current at its commencement, between Tasmania and Campbell Island, was found by Freycinet to be on an average 40 miles a day easterly; 29 miles between Campbell Island and the meridian of 140° W. long., its direction being N.E. and N.N.E.; and 17 miles between the meridians of 140° and 100° W. long., its direction being N.E. The rate of this current must be very variable and greatly influenced by winds from N.W. to West and S.W. which blow constantly in this zone of the Pacific Ocean, and often with considerable strength.

Northern Branch of the Counter-Current.—The northern branch of the abovementioned Mentor Current loses itself in the equatorial current. It always flows eastward as far as the meridian of 80° W., when it turns round suddenly by the North to West.

The breadth of this current varies from 350 to 800 miles. Its eastern limit closely approaches Humboldt Current.

Near the parallel of 26° S., where it runs N.E., N., and N.W., in the month of May its rate was found to vary from 18 to 21 miles a

day. In its southern part, at the same season, it varied from 10 to 22 miles.

The following temperatures were found in the Mentor Current, crossing it from West to East: at its western limit 72°; 69° in its middle; and 67° at its eastern limit, on the parallel of 33° S. lat. In May the temperature was found to be 67° at this same eastern limit of the current, in 26° S. lat.

The attention of mariners should be directed to this current. The islands of Felix and Ambrose will be found nearly in the midst of it.

Southern Branch of the Counter-Current.—The second or southern branch of the counter-current, after flowing eastward, becomes divided, forming two considerable currents, one setting S.E. and South, the other N.E. and North. This division takes place nearly on the parallel of 46° S., and about the meridian of 81° W.

The S.E. branch forms the current of Cape Horn, alluded to in considering the currents of the Atlantic Ocean. The northern part, flowing N.E., forms the cold current of the coast of Chili and Peru, and has received the name of Humboldt Current.

Current of Cape Horn.—The current of Cape Horn is first found at about sixty leagues from the coast of America, where its principal direction is E.S.E. and S.E. It then becomes S.S.E., and near the coast it assumes the same direction, flowing towards Cape Horn and preserving a breadth of about sixty leagues. Near the land it follows the windings of the shore, but at its outer limit it becomes gradually more easterly as it advances southward towards the South extremity of the land. It thus follows its easterly course round Cape Horn, extending on the meridian of this cape to the southward as far as about the parallel of 60° S. lat. Having passed the meridian of Cape Horn, it takes an E.N.E. direction and flows N.E. into the Atlantic Ocean.

The velocity of this current of Cape Horn varies from ten to twenty miles a day, but it increases as it advances southward near Terra del Fuego, varying from twelve to twenty-five miles a day to the westward of it. Westerly winds accelerate it in proportion to their force, and it becomes imperceptible with S.E. winds. To the eastward of Terra del Fuego, and a little North of Staten Land, the rate of this current was thirty-three miles per day.

On the parallel of Chiloe Island the temperature of the current of Cape Horn in April was 58°; on the parallel of the entrance of Magellan Strait 49°; a little East of the meridian of Cape Horn, 44°; and near Staten Island, 42°.

Humboldt Current.—The current of cold water which flows northward along the coast of Chili and Peru, called Humboldt Current, mingles at first with the Cape Horn Current, separating from it on the parallel of 43° S., flowing E.N.E. and N.E. on the parallel of Valdivia. Off Valparaiso its principal direction becomes N.N.E. and North, and it continues flowing along the coast of America as far as the parallel of Arica. Beyond the bend in the coast where Arica is situated the general direction of the coast of Peru is N. 50° W. as

far as Cape Blanco, in 5° S. Humboldt Current, after making the tour of the bend in which Arica is situated, continues to follow the direction of the coast to the N.W., and on gaining the parallel of Payta, near Cape Blanco, it leaves the coast, turning suddenly W.N.W., passing the Galapagos Islands, its North limit being nearly thirty leagues North of them. It thus enters the northern hemisphere of the Pacific Ocean, reaching as far as 2° N., increasing gradually as it flows West and losing itself in the Equatorial Current.

The extent of this current from the coast varies considerably. On the parallel of Valparaiso it is 120 miles; it increases as it flows northward and when, off Payta, it leaves the land, flowing W.N.W., its distance from the coast is nearly 180 miles. On the meridian of the Galapagos its extent is about 500 miles, and it is also the same on the meridian of 105° W.

Occasionally, however, anomalies are found in this current. Thus, in some places, instead of North it flows South at the rate of half a mile or a mile, and even more.

The times at which these changes take place cannot however be anticipated. There seems no apparent cause to occasion this southerly set, which is often met with immediately before or after northerly winds. But this is not always the case, and must not be considered as a general rule.

In the immediate vicinity of the coast of Chili and Peru in many parts a counter-current to that of Humboldt, flowing principally to the southward, is found, following the windings of the shore, with a velocity varying from three to twelve miles a day. This counter-current is necessarily produced by the Humboldt Current.

The temperature of the water of the Humboldt Current increases gradually as it flows to the northward; but the increase is considerable, as may be seen by the following observations:—In the latitude of Valparaiso the temperature of the current has been found to be 53°; on the parallel of Coquimbo it was 57°; on that of Cobija, 64°; on that of Arica, 65°; off Pisco it was 66°; on the parallel of Lima, 66°; on that of Truxillo, 69°; and on that of the cape of Blanco, 74°, the eastern limit of the current; and 66° on the western limit.

On leaving the current a little North of Cape Blanco, after a few hours the temperature of the sea was found to be 9° more than the temperature of the current.

The rate of the Humboldt Current is very variable, as it meets with other currents. In general its rate is greater near the coast than out at sea, as is the case with all those that flow along the coasts of continents, a circumstance observed by Humboldt. The minimum rate of it, by the *Bonite*, from Valparaiso to Payta, was three miles; the maximum is twenty-six miles a day. The first was found between Cobija and Callao; the other between Callao and Payta. The *Venus*, from Valparaiso to Payta and the Galapagos, found the minimum rate to be six miles, the maximum twenty-six miles a day: the first on the parallel of Arica; the last between Valparaiso and

Cobija. Humboldt concludes from these observations from Valparaiso to Coquimbo, and principally from Arica to Lima, that the rate of this current is from twelve to fourteen, and even eighteen miles a day.

When the Humboldt current runs N.W., suddenly leaving the coast, in the latitude of Cape Blanco, its general rate is about eight miles a day, and the mean rate of it, from these observations, was about fifteen miles a day.

The importance of this current to navigation may be easily understood for vessels from South to North. They make the run from Valparaiso to Callao in nine or ten days, and from Callao to Guayaquil in four or five days. On the contrary, it requires weeks and even months to make the return voyages, especially if the coast is kept, when the route is often impracticable.

Equatorial Current of the Pacific.—The southern limit of the Equatorial Current is considered nearly on the parallel of 26° S.; its northern limit, with some modification, is on the parallel of 24° N. Thus the waters of the Pacific Ocean, in a zone comprising 50° of latitude (nearly one-third of the distance between the poles), have a regular motion towards the West. However, within the limits of this zone and a little North of the equator, a stream of water flowing from West to East, which would appear to separate the whole Equatorial Current into two,—one North and the other South. This counter-current, which is in a great measure caused by the Equatorial Currents themselves, traverses the whole of the Pacific Ocean from West to East.

The rate of the Equatorial Current varies considerably. It has been found setting from thirty to fifty and nearly sixty miles a day. Its mean rate is from twenty-four to twenty-five miles a day. In considering this current generally it will be better to take it in its two divisions, as it is separated by the equatorial eastern stream above-mentioned, and we shall first refer to the Equatorial Current of the Southern hemisphere.

South Equatorial Current.—The South Equatorial Current is first experienced on the meridian of 90° W. Its southern limit is just to the northward of the southern tropic of Capricorn, and South of Pitcairn Island; thence it flows westward, nearly along the parallel of 26° S., as far as the meridian of the Tonga Islands.

Near this archipelago the current becomes separated into several branches; one of which has received the name of Rossel: its influence is felt on the South coast of New Guinea and in Torres Strait. The current is tolerably steady among the several groups of islands in this part of the Pacific Ocean, even during the N.W. monsoon.

Another branch of the South Equatorial Current runs along the eastern coast of Australia and as far as Tasmania, forming the warm Australian current, known as the counter-current of the South Pacific Ocean.

Between the parallels of 20° and 10° S. it is found that the mean temperature of the South Equatorial Current varied from 76° to 78° between the meridians of 107° and 122° W.; it has been observed to

be 79° to 81° between the meridians of 122° and 137°. Near Tahiti it has been found to be 82°. On the meridian of 188° and the parallel of 8° S., it has been found to be 84°, which is its maximum in the southern hemisphere.

The temperature of the sea out of the current has been estimated at 67°, that is from 9° to 18° below that of the Equatorial Current of this hemisphere.

Rossel Current.—The Rossel Current is a continuation of the South Equatorial Current, and was first noticed by Admiral Rossel in the voyage of D'Entrecasteaux. It receives the name when West of the Tonga Islands, or about North of the island of Tongataboo. Its northern limit is South of the archipelago of the Fejee Islands. It runs to the N.W. and the N.N.W., at about fifty or sixty leagues East from the archipelago of the New Hebrides. It then passes to the northward of the island of Vanikoro and South of Santa Cruz, where it continues flowing West, and is lost South of the island of San Christoval, one of the islands to the S.E. of the Solomon Islands.

The southern limit of this current, the volume of which increases in proportion as it is further West, is to be found nearly on the parallel of 25° S. It then flows W.N.W., passing southward of New Caledonia, where another branch of the Equatorial Current turns to the S.E., joining the warm current of Australia, flowing along the eastern coast of this continent.

The chief direction of the Rossel Current is W.N.W. and N.W. Its temperature is 78°. It is found as far as Torres Strait, and has an average rate of from eight to ten miles a day. Its maximum is about eighteen and its minimum four miles.

Current of the East Coast of Australia.—Along the East coast of Australia there is a general current and a periodical current.

The general current of this coast—a branch of the Equatorial, or rather a continuation of it—only takes that name on the parallel of Sandy Cape and on the meridian of 167° E. Its direction is S.W. as far as about 30° S., and it continues along this parallel to 480 miles from the coast. South of the parallel of 30° S. its direction is nearer S.S.W., and it becomes more southerly in proportion as it approaches Tasmania.

Its extent from the coast is about 300 miles on the parallel of 30° as far as the southern extreme of Tasmania, where it divides into two branches. The least, which flows round Tasmania, returns along the West coast of that island to the N.N.W. The other, flowing S.E., meets the cold waters flowing to the northward from the southern latitudes, and, taking an easterly direction, forms a part of the counter-current of the Pacific already mentioned.

The temperature of the Australian Current on the parallel of Port Jackson is 64° at its easten limit; 70° in the middle; and 68° near the coast.

This temperature rapidly decreases to the southward. For instance, on the parallel of Bass Strait it is 60° at its East limit, and the direction here is S.W. South of Tasmania the temperature was found to

be 54° or 56°, and the temperature of the adjoining sea in this part 51° and 49°.

The maximum rate of this Australian Current is nineteen miles a day, and its minimum about six miles.

Besides the general current abovementioned, there is yet near the coast what may be considered a periodical current.

Lieutenant Jeffries, who was a long time on this coast, shows that from the parallel of 28° to the South part of Tasmania during their summer, that is, from the month of August or September to April or May, the current runs S.b.W. at a rate of quarter of a mile an hour, but not further than twenty-one miles from the shore. Beyond this distance from the shore, and even to about sixty miles, it runs N.b.E. at a rate of three-quarters of a mile an hour. In winter the foregoing currents are reversed.

It follows from the foregoing that the navigation along the East coast of Australia, according as a vessel is bound northward or southward, will depend upon the season; and, according to those circumstances, she should keep near to or at a distance from the coast. A vessel, however, compelled to keep the coast on board in order to profit by the periodical current, requires to be managed with much circumspection and great attention should be paid to the indications of the barometer in case of a gale, in order to keep off the land. It must not be forgotten that it rises at this part of the coast with S.E. winds and falls with those from N.W., as we have before remarked; winds from N.E. and S.W. seem to have no influence on it.

(To be continued.)

REMINISCENCES OF ST. DOMINGO IN 1849.—*By M. S. Nolloth, Captain, R.N.*

Dear Sir,—The Haytian political seesaw has just made another tilt; "the empire" has again fallen—crown, sceptre, orb, and all have draggled in the mire, the chief himself has been shot out upon the neighbouring island of Jamaica, and "the republic" is again on high. Thinking they may amuse those of your readers who are personally unacquainted with St. Domingo, I send you some notes of impressions received during a visit in 1849,—the major part jotted down freely as events occurred.

You are aware that the negroes of Hayti were not long in repaying their French masters for the lesson taught them by the great revolution, and that since their independence, still keeping their eyes upon their political exemplars, they have oscillated between the republic and the empire, excepting the years during which they enjoyed the peculiar advantages of a republic and a rival monarchy at one and the same time.

The *Plumper* arrived at Port-au-Prince on the 24th July. Our able Consul-General, Captain Courtenay, R.N., was in England; but he was well represented by his zealous locum-tenens, who informed me that affairs were in a very unsettled state. The ordinary tribunals were suspended, and juries of Generals were trying individuals accused of state offences. These juries were *cassés* if found too uncompliant, and the acquitted prisoners submitted to finer meshes. Great discontent was the consequence, and an apprehension was general among the European residents that a serious crisis was at hand,—probably an insurrection and massacre such as had not long before occurred.

Among the persons undergoing trial, and the most notable of all, was a mulatto General, Céligny Ardouin. He appears to have had much to answer for. He had been partially educated in France for the law, and being a clever, unscrupulous, intriguing fellow, with great volubility of tongue, was, of course, a great favourite with the people, who looked upon him as the champion of their rights. He had mainly contributed to the election of Soulouque to the Presidency, and had been his Chief Minister and friend; but it soon transpired that he had been actuated solely by sinister and selfish views, and that he was the head of a disaffected party, who, believing Soulouque to be a quiet, easy-going man, neither overburdened with intellect, nor given to strong political convictions, had helped him to the presidential seat as a puppet and convenient instrument for the furtherance of their own designs.

As soon as Soulouque discovered that his proud position at the head of the negro community was not the result of deference to transcendent merit, but of a supposition that he would prove a ready tool in the hands of acuter men, he is said to have inwardly vowed the destruction of every one of the hypocritical crew. The deep wound in his amour-propre seems to have roused a dormant energy to life. He at once exhibited a zeal and talent for public affairs of which he had been previously quite unsuspected, and he probably felt a secret delight in showing that the supposed harmless, honest, dupe was as clever a rogue as the best of the clique. At the same time a new ambition was awakened, and he formed his plans accordingly.

He knew that haste would spoil his plans. "Liberté, Egalité, Fraternité," had long headed all state proclamations, and were ostentatiously displayed in various forms to the public. He therefore worked on warily, and disarming suspicion by appearing unsuspecting, he kept his own counsel, having probably learnt a lesson from his enemies, who were reported to have made more than one incautious boast. The ground was gradually cleared of obstructions,—a considerable number of individuals were imprisoned, and at length the arch-enemy and several of his co-adjutors were seized, and at the period of our arrival at Port-au-Prince were undergoing trial by court-martial for conspiracy against the life of the President.

On the 26th, three prisoners—Generals Milord and Maçon and a lawyer named Garçon—were condemned to be shot, and others to be reconveyed to prison and left at the disposal of the President. To

lookers-on, this sentence savoured sufficiently of complaisance to the will of the great man; but his Excellency refused to confirm it,—ordered a fresh trial,—caused four unfortunates who had been confined under sentence of death for nearly a year to be shot in the market-place at a quarter of an hour's notice, although the extreme penalty had been remitted,—and it was currently reported that the three individuals just condemned would be shot on the following morning. Much sympathy was felt for them, for they had many friends, and the European residents feared that their execution would be the signal for an explosion of popular indignation.

It appeared that there could not well be a more fitting opportunity for the exercise of that moral influence which the English are generally supposed to have with the sable race, and which, as all must allow, we have justly earned. But there were difficulties in the way: "Soulouque was a wilful man who could not be easily diverted from a design once formed,—an ignorant semi-savage, unfriendly to Europeans," &c. Again, here, as in other partly civilized countries, there were two parties in the foreign diplomatic body: "an independent move on one side would certainly cause jealousy on the other,—to fail in a single-handed attempt would be injurious to the cause in hand, and, in any case, a bad feeling would be engendered, inimical to co-operation in important joint interests hereafter."

It was said, moreover, that some deference was due to an European official of superior rank, who, although in one sense a rival, must be, nevertheless, treated as a colleague; and it was at length agreed that the colleague's assistance should be invited. To be brief, the invitation was not encouraging. "Mais Commandant! qu' allez-vous faire avec ces nègres là? Croyez-moi; vous n'y ferez rien—du tout—du tout. Laissez donc ces," &c. But it was clear that if in such a case as this, the nation of one of the parties did not stand on peculiar vantage-ground with the blacks of St. Domingo, that of the other did; and that an attempt ought to be made to turn our advantage to account when the interests of both natives and Europeans were at stake; and finally the Acting-Consul kindly consented to accompany me to the President, who consented to receive us on the 27th.

This was not so early an appointment as we had hoped for, but in the meantime, ***the expected executions did not take place.*** This was attributed by the European residents to our having ***privately*** informed the Sécrétaire-General of the main object of our visit—***ostensibly*** one of mere ceremony.

We were received with due honours in the court-yard of the palace, and a mulatto gentleman—a confidential Minister and friend of the President—conducted us, after a short conversation, to a spacious room, modestly furnished in European fashion, and at the further end of which stood Soulouque, in a dress not unlike our naval uniform, with long loose epaulettes. Advancing a few paces to meet us, the latter shook hands with us courteously and begged us to be seated.

The Captain of a French vessel-of-war in the port had truly told me that I should find the President "un beau nègre—un nègre de

très bon port, et noir jusqu' au blanc des yeux;" adding that he never would, when he could well avoid it, converse without an interpreter with Frenchmen or with those whom he thought able to detect the roughness of his creole *patois*. The latter hint proved useful. A good deal of common-place conversation took place. At first he attempted to address us through the Minister who sat by his side, but we always contrived to show that his French required no interpretation, and he soon commenced to talk to us directly without any apparent constraint. England—steam-vessels in general, and mine in particular—Jamaica and its Governor, came one by one on the tapis.

The visit had lasted a reasonable time for one of ceremony, and yet no proper opening had occurred for joining issue, as if incidentally, in a matter of life and death. On leaving Jamaica, Sir Charles Grey had requested me, in the event of my seeing Soulouque, not to make a formal complaint, but to make certain statements regarding the Haytian Consul, who, to magnify his office and to enhance the value of his services to his master, was in the habit of causing much trouble and uneasiness by false or highly-coloured reports of conspiracies against him by Haytian refugees. This subject naturally led to an assurance of the kindly feeling entertained for him by the English Governor, which seemed to gratify him, and he made very suitable response. I was about to improve the occasion by introducing the business in hand; but, recollecting his character and the incidents of his career, I was checked by an idea that the slightest suspicion of insincerity and ulterior views in what had just been said, might prove fatal to the white man's suit.

The ordinary conversation was resumed, when Soulouque abruptly inquired,—"Èh ben Mossiul Commondong—quong vous proposez-vous de quitter la rade?" This was the wanting *àpropos*, and I replied that according to my instructions I ought already to have been on my way eastward, but that I was unwilling to leave the capital in so disturbed a state,—a state which, as an Englishman, I was very sorry to witness. At this, a change came over his hitherto placid countenance, showing decided symptoms of a ruffled mind, and, half rising from his seat, he exclaimed,—"Mais qu' est-ce que cela veut dire, M. le Commondong? Expliquez-vous dong!" Explanations took place on both sides. We pressed him to pardon the three condemned men, and enlarged as delicately as we could on the danger of extra-judicial proceedings. As he warmed with the subject he spoke rapidly, and but for the assistance of the Consul, who was accustomed to the negro lingo, I should have been often at a loss. He repeated several times, "Je suis Chrétien! Chrétien, moi! j'ai de la conscience, j'ai de la conscience," carefully pointing to his breast, as if to show us exactly where his conscience lay, and declared his aversion to the unnecessary shedding of blood. This afforded us an opportunity of saying that it was from his love of clemency that we had indulged the hope of a successful appeal to him, but he suddenly interrupted us with "Mais en Angleterre il y' a rossi (aussi) des fusillades n'est ce pas? Ehn M. le Commondong? Il y'en a rossi chez vous quong

il y' a des attentats, ehn?" Of course our replies were such as to afford him no encouragement on this head from *English* example. He then said something about "Chef d'état," and several times repeated, "Ma vie m'est chère à moy."

As he had thus given us the key-note to his feelings, our arguments took their tone accordingly, and I assured him that I was so desirous that the three recently condemned prisoners should not be executed, and that consequent tranquillity should be restored, that if he would pardon them I would at once take them to Jamaica with others who had been found guilty of conspiring against his life.

While listening to us, he seemed to find some relief in constantly halving the displayed area of a large cotton handkerchief till it became a thick pad, with which he mopped the perspiration from his broad ebony forehead; then, holding it by two extended corners, he let it fall, sail-fashion, to its full proportions, and recommenced the duplicating process.

We assured him several times that the English took a great interest in the affairs of Hayti, that our countrymen would be much pleased to hear that he had allowed an English vessel of war to remove his enemies instead of destroying them, &c.; and at length our eloquence, or the red handkerchief, began to work a favourable charm, and to our great satisfaction elicited the declaration,—"Je sais *ben* que les Anglais sont les amis de ma race." We did not fail to encourage the growing sentiment, but, again half rising from his seat, he abruptly exclaimed,—"Quant à ce M. Céligny—voici Vendredi; Samedi il me—(joining the ends of his thumb and fingers and darting them rapidly to and from the floor) et moi rossi." He added a phrase, of which the only words I could distinctly catch were "hors d'état." In plain English,—"As for that fellow Céligny he'd put me under the turf this very moment if he could, but I'll be before-hand with him and do as much for him."

It was clear that M. Céligny's days were numbered, but the exclusive denunciation of the chief traitor gave us hope for the others, and the offer to remove them was repeated. Being pressed to speak more decidedly than he had yet done, he said that he would consider the matter; which not being thought quite satisfactory, he assured us that we "should receive a letter from the Sécrétaire-Général," and seemed disposed to close the interview. But we feared that existing good intentions might vanish with ourselves, and no promise had been made as to the purport of the coming letter. So we returned to the charge, and were finally rewarded by Soulouque saying hurriedly. "Mais il y'a encore des formes à remplir."

We did not think it prudent to press for more, and, showing him that we took these words for a sufficient guarantee, took our departure, receiving a rather more cordial shake of the hand than before. He remained standing near his seat as we traversed the long room to the door, and returned our final bow in a very dignified manner.

We were much disappointed with the Minister. On receiving us outside he had expressed very decidedly his approval of the real

object of our visit,—thought it might prove of the greatest service, &c., &c., and we therefore reckoned upon at least his countenance. But when in the presence of his master his conduct was quite inconsistent with these assurances, and he now and then enforced the President's objections with—"Mais voyez-vous Monsieur. Vous comprenez ce que dit son Excellence?" and so forth. I was told that he feared his chief and had more than once tendered his resignation.

As I did not think it right to sail till the receipt of the promised communication, and as this had not arrived on the third day following our interview, the Consul wrote to the Sécrétaire-Général and received a prompt reply, with an assurance that—"S.E. le President tiendra la promesse qu'il vous a faite, à vous et à M. le Commandant, mais son intention n'est pas de deporter les condamnés," and expressing thanks "pour avoir bien voulu transporter ces condamnés hors du sol d'Haïti," &c.

This was clear enough, and we sailed for Aux-Cayes, which we reached on August 4th.

I may add that the foreign official who had declined co-operation did not withhold his congratulations on our success, which, he admitted, he had not in the least degree expected.

On the following day, when on the way to my boat, I was addressed by some natives who had heard of our intercession. They expressed themselves very gratefully, and seemed rather demonstratively disposed, saying, "Quand ils vous voient, leurs familles vous baiseront les pieds, car de vous ces pauvres tiendront la vie." And one seemed strongly inclined to "me baiser les pieds," there and then.

Negroes in authority are said to ride the high horse, and our experience at Aux-Cayes certainly tended to confirm the statement. We have, or had, no British accredited agent here; but the Governor of the *Arrondissement*, General J. C., was duly informed of our arrival, the proper salute was fired, and my intention to call and pay my respects to him at his convenience was conveyed. At the time agreed upon the Captain of the Port received me at the landing-place and accompanied me to the Governor's. On the way he appeared to be giving himself curious airs,—stopped several times to speak to passing friends,—and asked me several non-pertinent questions.

Arrived at the residence of the great man, a seedily dressed, sprawling sentinel was roused up from his siesta on a bench in the hall, and, after considerable delay, a janty young negro Aid-de-camp made his appearance, and informed me in a cavalier manner that the Governor had gone for a ride and would not be back for some hours, and that I could go and see the Commandant de la Place. I told him that I had called as arranged to pay my respects to his chief; and, leaving a card, said that I should return to my ship. Two days afterwards the Governor was informed by an European resident who was on friendly terms with him of what had taken place, but the reply was not at all satisfactory.

At about the same time I learned that two of the officers, while in

the act of taking observations for chronometers, had been arrested by a party of soldiers and marched to the residence of the Governor; who, instead of instantly releasing them and punishing the offending soldiers, pretended to—perhaps he really did—believe that the officers were on a treasure-trove expedition, and inquired whether the quicksilver for the artificial-horizon had not been used for the purpose of discovering hidden money. It is probable that with their imperfect means of interpretation, the attempts of the officers to initiate his Excellency into the mystery of *bringing the sun down with a sextant*, rather confirmed his suspicions that some black-art dodge had been played. However, he dismissed them, saying that they ought to have requested permission before making such observations.

This indignity deserved a severe and summary measure, but there were good reasons for not taking any direct steps against this ignorant official—who was said to entertain a dislike to white men,—especially as we were within so short a distance from the seat of government, and at a time when it was reasonable to suppose that a continuance of friendly terms with the President might be of importance on my return to Port-au-Prince.

Eventually, ample *amende* was made. I was informed, in reply to a strong complaint to head-quarters, that the President was "désolé" at what had taken place,—that the offender had been ordered to explain his conduct on both the above-mentioned occasions, and threatened with the President's severe displeasure should anything of the kind take place again. I was informed at the same time that orders had been transmitted to the authorities of all the ports of the republic to prevent the possibility of anything of the sort occurring in future. The Sécrétaire-Général stated in his letter that he could not avoid believing that the "regrettable difficulties" had arisen from some misunderstanding; but his expression "je regrette toujours infiniment de semblables incidents," seemed to imply that this was not the first time he had been troubled by the ignorant misconduct of men of rank.

It is said by persons well acquainted with their character that when in power negroes often exhibit a peculiar sensitiveness, indicating an impatient consciousness of inferiority, in their intercourse with whites, and that they seem to receive with suspicion any mark of deference from them; while, on the other hand, the lower classes generally show a sincere respect for white men, which is readily paid, however independent of them they may be.

The term "white" in Hayti is certainly a more respectful epithet than its correlative "black" when used by us. A negro whom I met at Port-au-Prince in a very narrow, jungly lane, backed his horse with some difficulty into the bushes, giving me the whole passage, and, gracefully bowing, with his hat raised, said, "Passu, Mossiul blong!" ("Passez M. le blanc.")

The discipline and soldier-like bearing of our own West India negroes are well known, but Haytian sentinels sometimes indulge in a recumbent position, with their muskets at a convenient distance; and the

evident struggle between love of ease and sense of duty when an officer passes is sometimes very amusing. At Aux-Cayes one, whose half-and-half manœuvre I had not observed, called out, "Mossiul blong! non pas vouiez moy salue?" At which, siding with his humour, I turned back, begging his pardon; and as I rode slowly past him a second time the sentinel stood quite erect, saluting me with military precision. As I returned his compliment in the most officer-like manner I could muster, he showed unmistakeable signs of a satisfied sense of self-importance, and, forgetting strict military etiquette, gave me a parting,—"Bong jour, Mossiul blong!"

We had no great reason, on the whole, to quit Aux-Cayes with regret, but I must acknowledge my indebtedness while here for a wrinkle in criminal jurisprudence. One of our blue-jackets was robbed by some negroes when ashore "on liberty" and intoxicated. The resources of the Chef-de-Police were put into requisition and proved fully equal to the emergency. In a day or two several men, assuredly not without good cause, were apprehended,—placed in a room,—supplied with thick ropes' ends, and with the monition—

"Lay on (Macduff,)
And woe to him that first cries *hold, enough.*"

made to belabour each other in pairs.

The result was speedy and highly satisfactory. In little more than a minute there was a half-suppressed cry of "peccavi!" followed by twenty Mexican dollars' worth of information by the most, inwardly or outwardly, thin-skinned performer. A few instants more and there was a pretty general supplication for a "cessation of arms." This was readily accorded, and a group of wagging heads and gesticulating hands occupied one corner of the room. But the official was not to be trifled with, and he soon cut short the confidential whisperings with a sort of "Time's up" kind of announcement, when two or three of the combatants volunteered a statement. This was equivalent to fifteen dollars more—making up the whole sum lost and won.

It must not be supposed that this limb of Haytian law reversed our maxim, and held it better that ninety-nine innocents should suffer than that one rogue should escape. He was evidently a man of discrimination, and was satisfied that each one there had been directly or indirectly engaged in the transaction, or would have been had he been invited, or had been, or would be at some future time, concerned in a similar offence, and that at any rate they were all gentry likely to be in each other's confidence,—in other words, they were clearly "the right men in the right place." And how simple the process! No tedious delays,—no conflicting evidence and false swearing,—no prison expenses,—no lawyers' fees. Besides, why should not rogues work out their own problems? If our London Police Magistrates would only take a hint from Hayti, I'm sure it would save these painstaking men a world of trouble.

We left on the 6th and anchored at St. Domingo on the 12th.

This being a Spanish Independency we were not at all astonished to hear that the late President had just saved his life by disappearing in an English vessel of war, and that a new one was about to be elected. Our Consul-General, Sir R. Schomburgk, requested me to stay as long as possible, and I took up my quarters at his hospitable abode.

We called together on the Provisional Governor,—a very gentlemanly and apparently well informed Spanish creole. We had a long conversation on the unsettled state of affairs, and kind inquiries were made after the chief of the western republic which I had just left. The Governor informed me that if Soulouque, not contented with his empire of part of the island, should again invade the Dominicans, it would surely result in the annihilation of one of the contending parties,—"Seguramente,"—adding exultingly, "Que vengan! que vengan!"

On the following day we paid our respects to the Archbishop of of St. Domingo, a very agreeable and very good-looking elderly Spaniard, much more resembling a lively Frenchman of the old school than a grave and reverend Don. He had just assisted at a grand religious procession, and was in his purple shot-silk robe.

He at once put to me the question,—"Es usted Cristiano?" Not quite approving of this form of query, I rather demurely answered,—"No, Señor! soy Ingles, y *heretico*." At which he smiled, and crossed the room towards some shelves of diminutive books, with the intention, I imagined, of presenting me with some work suitable to a benighted mind; but, opening a drawer, he produced a box of excellent Havanahs; upon one of which he threw a light with the promptness of a true Spaniard, and assisted me.

While we were thus pleasantly engaged, he adverted to the state of European politics, and discoursed feelingly on the unhappy and humiliating position of his Holiness the Pope. He spoke of England in a very complimentary way, and expressed his belief that the people of this great country were gradually returning to the fold. We did not think it right to leave him entirely to his convictions, but he took good-naturedly what we had to say on the subject.

His private chapel—a small adjoining room—had an altar gaily decorated, and the walls were crowded with what, to the irreverent eyes of an English child, would have appeared a number of benevolent-looking wax dolls dressed for a ball; or a small colony from Madame Tussaud's. The features were certainly not Spanish. The hair was so flaxen, the eyes so blue, and the cheeks so ruddy, that I could not help believing the Archbishop had taken a hint from "Non Angli, sed Angeli," and procured his *penates* from our Bond or Regent Street. He told us that he was the only one remaining of fourteen Canonicos who had arrived from Spain some twenty years before. May he long survive them!

He gave us an interesting account of the cathedral, which is built on the spot upon which Columbus planted a cross on landing; and, accompanying us to the edifice, showed us this cross, which was painted green and is pretty well preserved. He pointed to a chest

firmly secured to one of the walls, informing us that it contained some very valuable, interesting relics. My attention having been drawn to them, I took the liberty of expressing a wish to see them; but this could not be; the chest was opened only once a year to regale the eyes of the faithful.

Among other interesting objects in the town is the house in which Columbus lived; also the tower in which he was cruelly imprisoned.

On the 14th we left St. Domingo with regret; but I was anxious to return to Port-au-Prince as soon as possible, and we arrived there on the 18th.

My apprehensions were partially confirmed. Several military executions had taken place a few days after our departure, including that of General Maçon—one of the three prisoners whose lives Soulouque had distinctly promised to spare—and General Céligny Ardouin. Here was a clear breach of faith, and the acting Consul had immediately asked for an explanation. A reply from the Sécrétaire-Général informed him that new evidence had appeared against Maçon and others at late courts-martial on different parties, and that the President had been influenced by strong "raisons d'état." Which was very true, as the sequel will show.

On the evening of 25th August, the Chamber of Deputies met, and at half-past ten, encouraged, we may suppose, by the fate of Céligny and other malcontents, passed unanimously a resolution to offer the title of "Emperor" to President Soulouque. Two days afterwards, and late at night, the Senate thought it prudent to arrive at a similar determination. Meanwhile, petitions, got up by known creatures of the President, were distributed for signature, calling upon the father of his children to accept the imperial dignity.

On the following morning, Sunday, some 6,000 troops were drawn up on the Parade, and a procession, with bands of music, headed by the Senators, Deputies, and various officials, proceeded to the palace. Many chief personages entered, and we may imagine the degree of innocent surprise with which the father received his children's unanimous demand to be thenceforth ruled by an imperial rod.

A delay of about two hours took place,—partly, perhaps, for a show of decent deliberation,—partly, no doubt, to complete the necessary preparations. During this interval there was a constant galloping to and fro of Generals, Grands-Juges, and other important functionaries, all anxious to tender their allegiance instead of their heads,—numbers of them from the interior; and this ready adhesion to the new order of things must have strongly reminded a Frenchman of an episode in the history of another country.

Eventually, Senators and Deputies, Grands-Juges, and Generals, reinforced by constant fresh arrivals, again formed in procession, and Soulouque was escorted to the cathedral and crowned as Faustin I. Attending privately, I had a good view of some of the proceedings; but it would be difficult to describe the scene with its strange paraphernalia of kingly pomp and circumstance. His burly Majesty wore a handsome uniform and laced cocked-hat, with a purple scarf across

his breast. Fresh from the slaughter of his enemies, he looked like a lamb led unconsciously to the sacrifice,—so thoughtful and placid was his countenance, with its large round eyes quietly fixed on an extemporary crown borne, on a cushion of red velvet, immediately before him. His stalwart, heavy-looking, mulatto spouse—the Empress—marched by his side with measured tread, and a dignified air quite adequate to the greatness of the occasion—yet unable wholly to conceal that her spirits were far more elastic than her step. The crowd of notables with cocked-hats and tall white plumes, and attired in ill-fitting yet well-cut coats of the ancient régime, the tails and cuffs encrusted with gold lace or embroidery,—the huddled masses of staring blacks, and the rude music of the military bands, together with the associations involuntarily suggested to an European, combined to make up a comic drama such as I cannot readily forget. The ludicrousness of the scene was enhanced by the quiet solemnity with which it was conducted, especially by those who played the chief parts. I was near his Majesty when an excited negro by my side, unable to control his emotion, disturbed the silence of the pantomime with a loud cry of "Vive l'Emperateur." "Empe*reur !—b-ê-t-e ! !*" was the indignant reproof of a courtier by his master's elbow, and the loyal subject vanished with confusion of face from the crowd. I thought it well to follow his example, and retired to a more secluded post of observation.

Soulouque must have managed his coup d'état very cunningly. So shrouded in secrecy were his intentions, that one of his ministers assured me he had no knowledge of them till three days before the coronation. The same official observed to me at the conclusion of the ceremony,—"Il a mangé, son pain blanc" ("He has seen his best days, his sorrows are to come").

All was quiet again, but it was thought that there might be some disturbances in the provinces when they became aware that they were no longer members of a republic.

In a few days the French vessel-of-war sailed for France, and we for Jamaica, to convey the important fact of a part of the Queen of the Antilles having been added to the list of empires.

When we first arrived, there were some twenty-five prisoners, not one of whose lives was supposed to be worth many days' purchase. Only two or three of them, as above related, perished. This, and the probable prevention of more extensive mischief, were not unreasonably attributed by the Europeans to our remonstrant intercession. The Acting-Consul had the satisfaction of receiving Lord Palmerston's high approbation of the intervention.

And now, after all this greatness, Faustin I., obliged to fly with ignominy from his infuriated people, has been charged with cruelty, malversation of public property, piracy, and other dire offences! But it might have been worse: the Emperor Desalines, when chased from his throne, destroyed himself to escape from his enemies; while my old friend Soulouque has been allowed to retire to private life in Jamaica. It is to be hoped that this indicates a step forward in

Haytian civilization. But what will become of the titled gentry,—the Dukes, Marquises, &c., of the empire? Will they be content to hide their diminished heads, or will they bide their time and look out, like their European teachers, for another Emperor? And the Empress, will she follow her exiled lord, or will she adopt the precedent of Petion's partner, who at the death of this President declined to descend, without fault of hers, from her high estate, and who, her claims being allowed, was, without further ceremony, retained in office by the new President, Bowyer?

The titles of Faustin's nobles were much ridiculed in Europe on his accession, but I believe they were chiefly the old ones of King Christophe's creation revived, and, like others, generally derived from landed estates. A Frenchman once twitted an educated negro with the absurdity of such titles as "Duc de Marmelade," &c. "Tenez, mon cher!" was the reply, "tenez! vous avec donc oublié ce fameux Godefroi, votre Duc de *Bouillon*. Encore, vous n'étiez pas autrefois sans *Bouilli*. Pour le moins, vous aviez votre Marquis de *Bouillé*. Pardien! notre Marmelade vaut bien votre Potage."

We must all wish the Haytians success in their attempts at self-government and European civilization, but I fear that hitherto they have not afforded us much encouragement; and this in a great measure, perhaps, from an inconsistent mixture of self-sufficiency and of jealousy of European superiority. It would be well for them if they would improve upon the lesson set by Desalines, and encourage the settlement of Europeans among them with equal civil—if not political—rights; but they have still to learn that true civilization is not usually of home origin, and that all they possess worthy of the name is derived from the white man. They seem to have readily adopted the personal manners and outward forms of the French, and to have clung to much of their own African barbarism.

The apparently inveterate African superstitions which still linger among our own West India islands are said to be rife in Hayti, and President Soulouque himself is said to have at least passively assisted at the celebration of the rites of fetiche worship.

Hatred of labour is another of their besetting sins. An American observed to me,—"They are an idle lot here as I ever saw. We and your country have done *something* to bring 'em out, and I for one should like to squeeze a little reciprocity out of 'em. The fact is, these fellows here just scratch the ground and drop the seed, then scratch their hides and go to sleep: and when they wake up they find themselves in the midst of a plantation."

The Haytians have well-watered, fertile valleys; and, though many parts are mountainous, there are extensive plains, with excellent pasturage for cattle,—well-wooded districts, and gold and silver mines; and traces of ancient European industry are not wanting, sufficient to stimulate a race with any energy. But with all these advantages, their great aim has always been to subjugate the Spanish portion of the island, neglecting the riches placed by natnre at their own door.

Haytian Governments have always been adepts in one species of

manufacture—that of paper money. When we were there, fourteen or fifteen of these dollars fetched one Mexican silver dollar. The European merchants, not requiring waste paper, were anxious to get *coffee* in exchange for their imported goods, but when we were on the coast the supply was not equal to the demand. Sugar was, under the European rule, exported in considerable quantities; but, sweet as sugar is, doing nothing is sweeter still to the free African, and very little was brought to market. Yet the lazy fellows grumbled because they could not procure a sufficiency of English cloths and cottons for gala days, and the government had recently forbidden the sale of coffee to foreign merchants unless a certain proportion of goods was parted with at a fixed price in paper dollars. This attempt at forced sales had done much harm, but the Haytian political economists could not believe in any other than a good result from so ingenious a device —the invention of a Minister named Solomon. It is called "Loi de Monopolie," expressive, I suppose, of the wish to encourage foreign trade by retaining all its profits. I was assured by European residents that the population was fast decreasing.

The clergy of Hayti and of St. Domingo are from France and Spain respectively, and are said to be far from being the élite of their order in these countries, but perhaps this applies only to the lowest ranks. Our friendly Spanish Metropolitan—the only clerical person whom I met—must certainly not be placed in the category. Soulouque was anxious to have an Archbishop, or at least a Bishop, as well as the Spanish part of the island; but the Pope is reported to have declined—not considering the Haytians Christians. This may appear a strange decision for a missionary church; but it must be allowed that a high ecclesiastical functionary would find himself far more awkwardly situated in Hayti, where European social and public customs coexist with the loose notions of morality common to Africans, than a Bishop *in partibus* wholly *infidelium*. A Bishop would have a difficult part to play at court if called upon to consecrate the elements of fetiche worship,—birds' bones, dogs' teeth, or any other such objects of special adoration; or if a Madame Petion-Bowyer insisted on her share of the episcopal benediction, or the throne, or presidential seat.

Most of us have heard the story of the picture sent from France to ornament one of the principal churches, and which, when it was found that certain of the figures were of the conventional dark hue, was at once consigned to some lumber-room or underground receptacle. In one of the churches was a large picture exhibiting a black man and a white in fraternal embrace, and in which an anthropomorphic representation of the Deity in the act of blessing them told, though negatively, with equal emphasis against the native complexion. Æsthetical matters involving colour must, one would suppose, often puzzle the poor negroes' progress in the belles lettres and fine arts.

Desalines, the first elected Emperor and a thorough-bred black,

seems to have been determined to turn the tables upon us. In abolishing the slave-trade and slavery, he decreed that no white could hold land with the title of proprietor, and that thenceforth the Haytians were to be styled "blacks." However, the Haytians, like other negroes, often betray that in their hearts they believe that, of the two, *white* is the proper colour.

But, though Desalines thus nailed his colour to the mast, he was far from entertaining an ignorant dislike of white men. On the contrary, he encouraged them to settle among his people, and fully appreciated the debt which his race owes to Englishmen,—as shown by his beheading one of his soldiers "for daring to insult a countryman of Wilberforce."

Every one who has visited the coast of Africa is aware of the fondness of the natives for showy European dresses, and that on the principle of half a loaf being better than no bread, they do not think it necessary to deprive one portion of their body of embellishment merely because another is ill-provided. A late naval officer used to relate that, having arrived at a Haytian port shortly after the French had hastily evacuated it, he was boarded by the Captain of the Port, in a handsome uniform coat, but with little else in keeping with it. Chatting in the cabin over a glass of grog, the latter put to the Lieutenant many questions regarding his professional career; and, being interrogated in turn, he was asked, among other queries, where he had procured so magnificent a coat. Upon which he observed that *he* also had done the state some service:—"You see yonder islet. When the French were driven away out of this, they left a number of sick on it under the charge of a Chirurgien-en-Chef. I got up a good party of volunteers, and on a dark night we fell upon them and killed every one," and, tossing up his embroidered tails, this is the coat that belonged to the head doctor,"

("Who wore that day the arms which now I wear.")

But to revert to Faustin I., now plain Faustin Soulouque, Esq., of Jamaica, and, let us hope, now a wiser if a sadder negro. Though not without abilities amply sufficient to have enabled him to do good service to his country, one cannot suppose that he had any decided call for Emperorship. Instead of following the good example of the mulatto President Petion,—who died regretted by all classes,—he emulated some of the worst points of the cruel black King Christophe, without any of the latter's redeeming deeds,—such as encouragement of native industry and foreign trade and promotion of education. Christophe was also, by example and otherwise, a staunch supporter of the marriage law, which in Hayti is not held in peculiar sanctity. In other respects it may be said that Christophe attended greatly to the improvement of all morals, save his own. Instead of attending to his own business, Soulouque neglected internal administration and the development of the rich resources of his proper country, for *foreign affairs,—i.e.*, attacking or preparing to attack

the Spanish part of the island, although his troops were always defeated. The Emperor Desalines was satisfied with his own dignity, and scorned to parody the splendour of European courts by a wholesale creation of cut-and-dried nobility; but Soulouque, like Christophe, as soon as he was crowned, began to enact the part of "le Grand Monarque," and great has been his fall.

It must not be supposed that much additional power is gained by Haytian chiefs on becoming Emperors. The Haytian lieges appear to have known little difference in this respect between monarchies and republics,—military rule seeming to be the "constitution," under whatever *form* of government.

It is not improbable that, like other crowned heads in unquiet countries, the ex-Emperor was prudent enough to provide for a rainy day by investing in English securities, and that he has a good account at the Jamaica bank to fall back upon. If so, and if he be wise enough not to play the Pretender among Haytian refugees, the "pain blanc" prediction of his minister on the coronation day may be only partially verified, and the last may be the best of his days. Although he did not wholly fulfil his pledge to us, I sincerely wish it may be so. Our zealous and enlightened Protestant West India Missionaries, who have done so much for our own people, will no doubt try to rectify his Romish Christianity worse-confounded, and to eradicate any remaining tendencies to feticism.

After all, we know from imperial histories that other mortals besides poor Faustin Soulouque have had their mental vision blinded by the blaze of their own imagined glory; while few have had so fair an excuse as he, who, having been a farmer's servant-boy, exchanged blue-dungaree for "the purple." And one little trait of character which I learnt at Port-au-Prince, and with which we will take leave of him, should be allowed to cover many errors, as showing that, perhaps, circumstances more than nature were at fault. While President of the republic, he now and then met his old negro master, who had been kind to him in his youth, and whom, I believe, he now substantially repaid. On these occasions, he would raise his hat (with no mock respect) and greet him with the friendly salutation,—"Bong jour! mon maître."

Yours, &c.,

M. S. NOLLOTH.

To the Editor of the Nautical Magazine.

THE PROPOSED SUEZ CANAL *Considered in Reference to the Influence of the Nile. From "An Investigation" of the subject by Captain Spratt, R.N., C.B.*

(Concluded from page 241).

Having thus shown that the sand of the Rosetta mouth extends along the whole coast to the Damietta branch, we will refer more particularly to the indications of its easterly movement within the depths of the sea.

On examining the bottom off and to the eastward of the Brulos promontory, it was ascertained that to a distance of three miles from the shore, and to a depth of six fathoms, it consists of almost pure silicious sand, with a few broken shells, and but little mud; but at 12 miles in 30 fathoms it was wholly coral sand, or pure sea productions. Also that to the eastward there exist knolls and isolated ridges of pure silicious sand, surrounded by deep water and a muddy bottom.

The predominance of sand off this projection arises from its being the concentrating point of the littoral currents and prevailing ground swell. These with West and N.W. gales, carry to it those deposits set in motion from off the mouth of the Rosetta branch, and which by continual agitation from this motion are freed from the muddy matter, which becomes dispersed to greater distances. All S.W. and westerly gales will evidently cause a ground swell directly along this part of the shore of the delta. But a N.W. wind will cause a ground swell somewhat oblique to the shore there; and hence a concentration of the matter at the point of convergence of these littoral movements, results at this prominence forming Cape Brulos.

It is, therefore, evident that both these effects, combined with currents, must cause a considerable advance of the sand in the shallower part of the littoral zone during the continuance of each gale; and that the S.W. and westerly swell will carry the sand forming the shore of Cape Brulos, and the shallows off the promontory, directly before it, that is, nearly parallel to the shore. Then as the bottom declines in that direction, that is to the eastward, across the bay towards Damietta, this decline aids the advance of matter across the bay; which advance, no doubt occurs in heavy gales to the depth of eight and ten fathoms or even more. As a proof of the movement of the sea bottom in those depths, I have seen in deep bays on the coast of the Mediterranean, where no current existed generally, and where only a wave movement could affect its sandy bottom, the sand at those depths as rippled as a sea beach, or the surface of a sand dune.

It has been shown that the grosser particles of the Nile's sand will be easily transported from the shallows off Cape Brulos, before a heavy ground swell from the West, into the deeper water across the gorge of the Pelusium Bay.

But as the bottom rises again by the projection of the mouth of the Damietta branch opposite to it, the wave and current influence, is in-

sufficient to transport the grosser matter up the incline; and thus it will accumulate there, and form banks and ridges in the gorge of the bay, just as they appear. But during heavy gales, the matter is again advanced either to the near shore or to the eastward as before.

The Nile during every high flood transports numerous fragments of pottery and brick to the sea with its deposits; and this debris of brick and pottery can be traced along the whole coast from Rosetta to Ras el Ghels. Some, no doubt, is carried out to these outlying banks, and therefore these fragments of pottery may form their nucleus.

By Captain Mansell's excellent survey of this difficult coast it appears that there are three ridges or banks between the Brulos Cape and Damietta mouth, occasioned probably from this cause. The surfaces of these banks are comprised of coarse silicious sand, identical with that brought down by the Nile, and also that forming the dunes on the shore at Cape Brulos.

No mud was found with the sand of these banks; and only in the deeps between them or outside of them in deeper water. So that, although they have from three to six fathoms over them, they are quite free of any muddy matter. And even in 10 fathoms we found sometimes the same pure coarse silicious sand; showing that in every gale the surface of these banks, although so deep, must be in motion as quicksands. But with a tranquil sea a thin layer of mud may be deposited over them, and thus not only their positions but the depths over the banks are subject to change.

Under the movement produced by heavy winter gales, a great reduction of them must result. And thus a continual loss of the lesser particles towards the East, and a continual re-supply from the Rosetta mouth to the West of them takes place.

Such seems to me to be the origin of these as isolated ridges in the gorge of this bay between Brulos and Damietta. And as the coarse sand composing them is not different from the sands of the desert near the Pyramids, or that on the route to Suez, they must undoubtedly be all the gifts of the Nile.

But these banks indicate only a minor part of the effect of the wave movement. The greater part, no doubt, would be on the line of littoral shallows near the shore.

Thus then is shown that whilst the Nile's influence to the westward of that mouth does not exceed a distance of 10 or 12 miles, to the East it is traceable as far as the Damietta branch as mingling with its deposits, and finally having a more easterly dispersal. This mud and sand is mainly traceable as a littoral zone of about 12 miles broad. For at the distance of 13 miles in the depth of 31 fathoms the bottom contained no trace of the Nile's deposits, but pure coral, coral sand, and broken shells.

Hence, also, the assumed dispersal of the Nile's debris into the deeper parts of the sea is not verified by an examination of its depths off this delta. Nor is the sand which it brings to the sea confined to the littoral zone within the depth of five fathoms, as asserted in the publications of M. de Lesseps; but, on the contrary, there is certain evidence that a large

quantity of it moves in much deeper water, even in eight and ten fathoms, as appears by the dredges obtained in the bay of Pelusium to the East of Damietta. There it is undoubtedly a point of much importance, in the question of drift and accumulation of matter, capable of forming shallows off the embouchure of a port or canal opening into that bay; or of being thrown by the waves against any piers that may be constructed to form a harbour there, transverse to the littoral drift.

Another point that seemed desirable to test, was the power of the prevalent N.W. wave or ground swell, in moving any matter accumulated on that part of the shore where it is proposed to throw out piers for the formation of Port Said.

In a former report I have remarked that although M. de Lesseps has stated that the shores of this part of the coast indicate rather an erosion of the shore than an encroachment upon the sea, such appeared to me to be merely the evidence of a lateral advance of the beach under the prevailing wave movement on that prominent part of the coast, and not a permanent encroachment. But it is not, like Cape Brulos, apparently a point of large accumulation. The dunes are not above five or six feet high between the Damietta mouth and the head of Pelusium Bay, for the prevailing westerly winds being more off than on the coast, and the prevailing wave having more a parallel than a direct or oblique action on it, as at Brulos, the sands cannot accumulate so rapidly as at Cape Brulos, as must be evident upon the least consideration or inspection of the chart of the bay.

One of Sir Wm. Reid's proofs of the beach movement on the S.W. coast of England, when studying that question some years ago, was the finding of fragments of the cargo of a collier some miles to the eastward of the place on which she had been stranded. Some of the ashes and clinkers from the *Medina's* engine room were therefore deposited on the shore at the site of Port Said, so that by their colour they might be traced in their dispersion. They were deposited in a heap above the water's edge, directly off the beacon which had been erected there during the commencement of 1847, when an Egyptian corvette was moored off there to test the anchorage.

On returning to the place after 12 days, not a vestige of the heap remained to indicate even the spot where it lay, although it amounted to nearly two tons; nor on the shore to the northward for 500 or 600 yards, could a single fragment of clinker be found. But on following the beach to the southward, in the direction of the prevailing wave movement, some clinkers weighing about two ounces were found dispersed to a distance of fully 1,500 yards, and at 240 yards I picked up one clinker that weighed 3½ lbs., also at 600 and 700 yards several that weighed from a quarter to half a pound. The greater portion were, however, buried beneath the sand of the beach with which they had been commingled in their movement.

Thus there was a positive evidence of the great easterly movement of the shore and littoral shallows along this coast, which, during a succession of winter gales, the prevailing N.W. breezes at the period

of high Nile, must cause a continuous progression of an immense quantity of the sands and matter carried out by the turbid river at these seasons.

Another important point indicating the direction of this movement revealed itself also at the head of the bay of Tineh, in a quantity of broken pottery and bricks, ancient and modern, scattered on the shore at the highest and lowest surf margin, which had come wholly from the mouths of the Nile, dispersed along the coast to the eastward by its littoral currents and the prevailing ground swell.

This was the account of the natives whom we found at Ghemil and Foum Om Fareg, besides it was afterwards traced to Ras el Ghels, and no doubt exists along the coast to El Arish and Syria. Indeed, the easterly drift from the Nile thus far seems proved also by the fact that the sponge divers never find sponges between Alexandria and Jaffa, and first only at the Marabout Point, entering Alexandria.

Even high on the sides of the moving dunes at Cape Brulos these fragments of pottery are met with, showing that the sea, the same cause had brought them there that had formed and accumulated the sands into moving dunes; and showing also the power of wind and wave in effecting their transport. Some of the fragments had evidently been in deep water, for a whole brick was found on the beach near Port Said with oysters on it, which with a fragment of a water jar five inches square dredged in six fathoms water a mile and a half off the headland of Ras Burun or Ras el Ghels, has been preserved as sufficient proof that they are even carried thus far from the Nile, and apparently are moved in deep water across the bay, before the heavier ground swells.

Fragments of concrete strewed with the pottery in some parts were also found in great numbers; particularly on the prominent parts of the coast, where there is a concentration of the wave movement; showing that where the pottery was numerous the fragments of concrete were also numerous.

This concrete is composed of sea shell imbedded in silicious and iron sand, cemented together. The induration seems to be rapid, and for the most part confined to shallow water, for a portion of a tree on the beach near the tower of Om Fareg had one side completely incrusted with this agglomerated sand, whilst the other side that had not been imbedded, was honeycombed by woodboring shells.

Iron sand is much found on all parts of the shore of the delta, particularly where the sand dunes are blown far within the shore, the heavy particles of iron being then left behind, and it is also generally abundant on some of the sand banks which occur within the river. It is probable that some of these outlying banks West of Damietta, and between it and Kas Burun or Ras el Ghels, have similar concretes forming on their shallower parts. For in two or three places, in dredging off the coast, as in four or five fathoms off Brulos Boghaz, and in 12 fathoms off Damietta mouth, the dredge was entangled on a hard and fixed bottom that would yield no fragments but broken shells.

In some of the sand sifted from dredges in Pelusium Bay there was 10 per cent. of iron sand, which the magnet removed from it when dry, the rest being nearly all silicious sand. The sand thus sifted from a portion of each dredge, tested by Mr. Willcox, the surgeon of the *Medina*, showed that there is fully an average of 90 per cent. of pure silicious sand (and therefore pure Nile deposit) in all the sand sifted from the mud in every dredge within Pelusium Bay, and within the distance of ten and twelve miles off the whole delta, where the Nile debris prevailed.

Thus the facts that have resulted from these dredges, show that the sea bed off the delta of the Nile contains a large proportion of silicious sand much outside the depth of 25 feet, where it is proposed to terminate the piers for Port Said, that must undoubtedly have drifted from the Nile. And the whole nature of the bottom, whether composed of sandy mud, muddy sand, or pure sand, according to the accidental proportion which the waves and currents leave, is identical with the Nile's sediment, and not with coast abrasion or sea productions. It has all come from the Nile.

Such, without doubt, is a very important fact resulting from this investigation, as is also the ascertaining the quantity of Nile sand that is dispersed in the different depths within its influence. From having been carried there by the littoral wave and current during heavy gales, this sand is consequently capable of being again moved by them, so as to embarrass a harbour formed to leeward of their movement, as in the bay of Pelusium. From the foregoing facts now established, the easterly dispersion of the whole Nile's deposit as far as Kas Burun or Ras el Ghels and Syria by the wave movement cannot be now doubted, since the portions of each dredge, amounting to nearly 200, are now preserved. and may be further tested, if desired.

And whether it be pure mud, sand, or sand and mud, that will be thus constantly carried to the eastward on a harbour formed in Pelusium Bay, it is all the Nile's deposit. Therefore it seems that the cost of any engineering works for its constant removal must be enormous, if indeed any amount of dredging capable of being carried on off the exposed mouth of such a dead-water canal as the proposed salt-water canal of Suez, will keep down the accumulation that must result from the littoral movement, either as blown or wave and current driven sand, that is undoubtedly continually drifted from the Rosetta and Damietta mouths of the Nile into and across Pelusium Bay.

The piercing of the Alps for a railway is comprehensible, as a possible project, because on the day the passage is opened the main difficulties are overcome. But to endeavour to contend in perpetuity by dredging or by prolongation of piers against the whole littoral movement of the Nile's deposit on the embouchure of a dead-water harbour is only the commencement of a perpetual difficulty, connected with the gigantic engineering project of the proposed canalization of the isthmus of Suez, with a channel of 27 feet deep. For every gale will obstruct the navigation, and crowd the bay and canal with de-

tained shipping,—will renew the obstruction and difficulty of ingress and egress, by throwing forward continually the sands and moving matter on the mouth of the harbour, and raising its shallows.

In calm weather Pelusium Bay is free of any current of consideration. But a few hours of a fresh breeze or gale from the westward, be it S.W., West, or N.W., soon changes its waters into a sheet of reddish brown fluid, and forces also a strong littoral current along the whole shore. In attempting to land there at the commencement of a fresh N.W. breeze, and whilst anchored in my boat in eight feet of water just outside of the line of surf, to see if landing was practicable, the boat was carried to the eastward of her anchor, and brought nearly broadside to the swell by the strength of the littoral current there. And on testing it by the log I found it running one knot per hour. But, no doubt, it was much increased later in the day, as the wind and swell both greatly increased.

The dunes at the head of the Pelusium Bay were traced for nearly two miles inland, and their surfaces were found not fixed, but entirely composed of the same silicious sand as the shores of the delta, and the shallows off the coast, indicating most clearly a movement of their surface particles to the S.E. and eastward. Even fragments of the Nile pottery may be found on them more than a mile inland, and more than 100 feet above the sea; fragments that must have been driven from the shore by the wind, as the sand has been. And although the inner sand ridges are dotted with succulent herbage from one to two feet in height, and also with a few woody shrubs of the same nature averaging from three to four feet in height, and they enclose besides a succession of small hollows or level plains on which this succulent herbage grows thickest, yet the South side of the hills are all steep, and all show a gradual encroachment of the sand on these plains, and also its retirement at the opposite side. For the whole surface sand is set in motion with every gale; the scattered bushes forming no permanent stop to it. And as it accumulates around their stems they each form a small hillock of sand; whilst between them, the ground is still a moving, loose, silicious sand; so moveable in fact, that in strong westerly breezes, the hills are obscured from view at two or three miles' distance, by the atmosphere being then converted into a mist of dust, from the moving particles which it contains.

Since M. de Lesseps does not represent these dunes in his map, it may be doubted whether he ever saw them; be this as it may, he makes a plain of nearly two miles broad to separate the higher sand hills from the sea. And this plain he continues as far as the ruined fortress, now called Mehemdie by the Arabs, or Gerre in the Atlas of M. de Lesseps illustrating his Reports, from the supposition that it was the site of an ancient fortress of that name.

It is possible that these lower dunes now bordering the coast for nearly four miles, that we found to be from 30 to 40 feet high, may have been formed in the interval since M. de Lesseps visited the coast. The Arab shepherds with whom we communicated on finding them pasturing their flocks on the upper ridges, stated that the dunes near

the sea all shifted, being carried into the interior. The removal and re-accumulation of all these sea-shore dunes may not occur each year, but still, as they do not appear on M. de Lessep's map, and may not have existed then, they would indicate the enormous amount of sand which is drifted from the Nile's embouchure past the site of Port Said, thus to re-accumulate so soon at the head of Pelusium Bay only, independent of that which is deposited on the promontory of Ras el Ghels (or Ras Burun) and to the coast of Syria.

The excellent chart of the West coast of the bay of Pelusium by M. Larousse, Sous-Ingénieur, Hydrographe de la Marine, published also in M. de Lesseps' Atlas, unfortunately terminates just where we found the sand hills to begin. Thus I have no means of knowing whether they existed at the time when that survey was made in the year 1853. But that they exist now, and are derived from the sea, cannot be doubted, and that they existed also on the same part of the shore at the end of last century is also certified by the great French work on Egypt.

These moving sands of the desert between Egypt and Syria, consisting of the drift sand at the head of Pelusium Bay, it was thus necessary to point out, from a conviction that they indicate that a large amount of deposit which the Nile annually brings to the sea is drifted along the shallows of that part of the coast where it is proposed that a deep entrance to the Suez Canal should be maintained without any engineering difficulties and at little cost: and especially to show the error of the opinion in reference to it in the "Report of the International Commission, No. 8, 2nd Series," and dated December 31st, 1855, on board the Egyptian frigate the *Nile*.

A well-sheltered capacious harbour will be necessary wherever the canal may be made, especially if in Pelusium Bay, in consequence of the obstruction arising from littoral drift, which every gale will throw across the embouchure and over the piers. There will then be the consequent detention of a large number of shipping during its clearance by dredging, if it be really possible to remove such an obstacle by dredging. The success of such attempts, through the exposure to the sea, may well be doubted, indeed in gales dredging will be impossible. For the transverse swell and current will be continually counteracting the effect of the dredges, by causing the mud and sand on the windward side of the part scooped out to flow into the excavation almost if not quite as rapidly as it is made, rendering the operation endless.

In a gigantic engineering project, involving such an enormous outlay for its execution as well as its annual maintenance, as these facts suggest, it is necessary that the commercial interests invited to speculate in it should thoroughly understand it, so as to form an opinion whether millions of money will not be fruitlessly lost in the depths of the sea. The experience of the past in the difficulties of engineering against similar hydraulic and physical conditions elsewhere should not be forgotten.

And will not the infiltration through the sides of a canal, excavated

in such loose matter, and at a level so much below the sea and the Nile, more than keep pace with any amount of dredging which it may be possible to apply, consistent with maintaining the navigation open? For this infiltration of sand from the sides of such canals within the delta, by the Commission's own showing, defeats all efforts to contend against it when dug below the Nile's low-water level, as the following extract explains (Section xv., 3rd Series): "It appeared to them (the Commission) impossible to maintain in proper repair a canal, the bottom of which was below the line of low water in the Nile, otherwise than by enormous expenditure; and even if incurring this cost, it was uncertain whether the desired result would be obtained. In all cases when an attempt has been to dig a canal below the low-water level, and more especially on the outskirts of the desert in Ghattal Bay, for instance, it invariably happens that about the level of low water a bed of loose sand is met with, as was the case at Masteroud. This constitutes an enormous difficulty, and a source of expense of which it is hardly possible to form any previous estimate. In the case of the Moëze, all attempts to dredge it have been given up." Here then is an opinion, supported by facts, that should be kept in mind in any discussion on the practicability of the canalization of the isthmus of Suez. No less so must the great preponderance of sand which the borings across the isthmus show to be present below the low-water level of the Nile and Mediterranean, all of it on the direct line of the proposed canal, and which I believe in ancient days must have come from the Nile.

POLA AND TRIESTE.

The Adriatic, or, as it is also called, the Gulf of Venice, is a considerable arm of the Mediterranean, bordered by the shores of Italy, Illyria, Dalmatia, and Albania.

Illyria, which forms part of the German empire of Austria, is redivided into two provinces. One, Leibach, includes the departments of Leibach, Newstadt, Adelsberg, Villach, and Klagenfurth. The other comprises the government of Trieste, which is redivided into three different parts: the first including the town and free port of Trieste; the second, the department of Gorico; and the third that of Istria. In this latter, with its shore of the Adriatic, is the establishment of Pola, in full progress of formation, and it would not be possible to find a more advantageous position for a maritime arsenal.

The Adriatic is about 150 leagues in extent from S.E. to N.W., and from 25 to 40 broad. Its entrance may be considered as formed by Cape Orso, on the Italian coast, and Cape Linguetta, on that of Albania. The coasts of the kingdom of Naples and those of the States of the Church border the Adriatic on the West, while the

shores of Istria, Dalmatia, and Albania front them to the East. The upper part of the gulf is bordered by the marshy plains of Venetian Lombardy.

The navigation of the Adriatic is dangerous in the winter, in consequence of its narrow limits and the frequency and violence of northerly and N.E. winds that occur there. They are termed boreals. They get up suddenly, come in tremendous gusts down on the coast of Italy, rendering it a dangerous lee shore for ships caught there by them; and it is principally in the winter that this wind is most frequent and most violent. It has all the peculiarities of the mistral of Provence, but is much more severe.

The sirocco from the S.E. must be considered the prevailing wind of the Adriatic. It produces a considerable sea, is generally attended with rain or fog, but is not so dangerous as the boreal. The N.W. wind raises but little sea, and occasions few wrecks in the Adriatic, as ships can run before it clear of the gulf. Westerly and S.W. winds come off the Italian shore and are harmless. N.W. winds generally prevail in the spring and summer, but sometimes give place for a whole month to those from S.E. Generally speaking, as soon as a N.W. wind ceases it is followed by that from S.E.

The port of Pola is situated on the best and most fruitful part of the coast of Istria, and there are few anchorages in the whole world so beautiful, so secure, or so extensive as that which it possesses. A point named Verenda terminates a high and bold peninsula at the entrance of the bay, at the head of which is the harbour of the new arsenal, situated to the N.N.W. of the town. The port, which has fathoms in it nearly to its shores, is deep and admirably commodious. A vessel in it can see no entrance of the bay, and is well sheltered from every wind. It lies between Isle St. Andrew and the Isle of Olives, and the town to the North and East, and between Isle St. Peter and the town to the South. Independently of the port, which is in all respects most magnificent, an extensive and secure inner road lies between the town and the Isle of Olives; and this is generally most frequented in the fine season, because it is cooler than the port.

Pola was once a station of the Roman fleet. The period of its greatest splendour was that of Septimus Severus, and numerous ruins of monuments of that epoch may be seen there. The most remarkable is a magnificent amphitheatre, which was restored in 1816, and is nearly as important as that of Verona.

For four years the Austrian Government has been carrying on considerable works at Pola for the construction of the arsenal, and at present is engaged in fortifying it; and by military men Pola, from its position, is considered as likely to become impregnable.

In this account of the recent Austrian maritime establishment of Pola, the limits of Illyria are stated. This important possession of Venice consists of two principal divisions. The first contains the province of Laibach, with a population of 750,000 souls. The second comprehends that of Trieste, containing a population of 450,000.

Trieste is again redivided into the municipal districts of Trieste, Gærz, and Istria.

The town of Trieste is the principal of the district bearing this name,—a chief sanitary and military station. The port is excellent, has been free since 1750, and renders the town one of the most important places of commerce in all Europe.

Trieste has been an Austrian port since 1382, but for a long time was no more than a fishing-station or harbour for coasting vessels. The Emperor Rudolph having passed an edict, in 1604, favourable to commerce and navigation. Trieste began in his reign to establish trade with the ports of the Levant and the Black Sea. In 1609, a mercantile house, of the celebrated name of Malonga, at Trieste founded an establishment at Trebizonde, which carried on an extensive business down to 1802. The Malongas extended their business transactions to Persia, and became the bankers of the Shah Nadir and his successors, to whom they made some considerable advances. They also transacted business for the Sultans of Constantinople, and in 1758 lent a hundred millions of piastres to the Sultan Mustapha III., who returned it most punctually and rewarded them with some important privileges.

Notwithstanding the progress of Trieste from 1604, it was not till the middle of the eighteenth century that it became rich and prosperous. In 1742 the Emperor Charles VI. declared the town free, and in 1750 Maria Theresa conferred the same advantage on the port. These measures, no less wise than useful, gave a considerable impulse to its commerce, and it was not long in becoming what it now is—a great, rich maritime commercial depot.

The town is divided into four parts, viz.: the old and the new towns, the latter called also Theresienstadt because its construction was commenced in the reign of Maria Theresa; Josephtown, founded in 1775, in the reign of Joseph II.; and the Francois suburb, founded in 1819. The new town extends to the base of the mountain on which the citadel stands. The streets are wide, and the houses well built. Trieste can boast 197 of the former, with 31 squares, a museum, a public library, and a celebrated literary establishment called Minerva. Among its public buildings, are the Jesuit's college, with its beautiful façade, the hotel de ville, and the bank, an elegant piece of architecture.

The cathedral also is no less worthy of admiration, if it were only for the beautiful relics of Roman production which have been so happily introduced into it. The monument to the memory of the celebrated antiquarian Winckelmann is there. This distinguished savant was assassinated on the 3rd of June, 1768, by a wretch named Arcanzeli, for the sake of the gold and silver coins which he had collected for the Vatican, of which he was the librarian.

Trieste has many other monuments equally worthy of admiration. Among them is the triumphal arch of Charlemagne; the remains of a Roman amphitheatre, found by the excavations ordered by Maria

Theresa in 1753; and a subterranean aqueduct of the time of Septimus Severus.

In 1740 the population of Trieste was only 9,000; but the measures adopted then increased it year by year. In 1775, it was 14,000; in 1802 it was 27,000; in 1808, 33,000; in 1817, 42,000; in 1821, 45,000; in 1829, 47,000; in 1832, 50,000; and at the present time it amounts to 50,000 souls.

The portion of the gulf of Venice to the West of Istria is considered the gulf of Trieste; which at the entrance is about six leagues wide, and perfectly secure everywhere, with nearly an equal depth throughout. It is one of the best anchorages in the whole Adriatic. The whole western shore is formed by the low lands of the lagoons of Venice; but the eastern side, or the coast of Istria, from the town of Trieste to Cape Salvore is high and salubrious.

The entrance of the port is open to the northward, but well sheltered from all weathers. There is a capital building yard, with all the resources of a good arsenal, a quarantine dock, and numerous storehouses. The port, which is surrounded by quays forming an obtuse angle, is separated into two equal parts by an interior mole 1,500 yards long and 900 broad; which, although it is open to North and N.W., affords complete safety, as these winds are from the head of the gulf. Large ships which cannot enter the port anchor to the West of the town, in twelve or fifteen fathoms.

The increasing importance of Trieste has induced the Austrian Government to transfer the military establishment to Pola.

The plant of the great steam navigation company of the Levant is at Trieste; and the commanders of ships which frequent the port consider it as one of the most desirable places they know, not only on account of its security and resources, but also from the affability and kindness of the authorities.

Trieste, like Pola, is situated in the German part of the Austrian territory.

Winds and Weather of the Gulf of Siam.

Commander Richards in his interesting work the *Gulf of Siam*, gives the following as the winds and weather experienced there.

The N.E. monsoon in the gulf of Siam, sets in early in November. It is usually preceded by a month of squally, variable, and uncertain weather.

In the months of November, December, and January, the wind blows between N.N.E. and East; generally strong breezes with a low temperature, occasionally as low as 65°. Along the eastern shore of the gulf at this time, the sky is frequently unclouded for a week together; but on the opposite coast the weather is wet and squally.

In Novemher and December strong squalls, with very heavy thunder and lightning, are occasionally met with near Pulo Panjang.

Towards the end of January the wind blows more from the eastward, and abates in strength.

In February the wind is more constant from E.S.E. than from any other point; it veers between S.E. and N.E., with occasional calms and squalls. Fine weather and smooth water now prevail all over the gulf.

In March, the monsoon cannot be depended on. In the middle of the gulf calms prevail with southerly wind near the shore, and occasional land and sea breezes. Towards the end of this month the weather becomes hot and sultry.

April is the hottest month of the year; calms may be expected near the middle of the gulf, land and sea breezes near the shore, and occasional slight squalls.

In May clouds begin to bank up, and an occasional shower relieves the intensity of a vertical sun. The S.W. monsoon sets in about the middle of the month, sometimes preceded by light flaws of wind and fine weather, but usually with squally weather and occasional heavy falls of rain. In the months of June, July, and August the S.W. monsoon blows strong with occasional showers; but generally very fine weather along the western shore of the gulf: out in the middle a rough sea; and, along the eastern shore, strong breezes with much rain, and occasionally a fresh gale.

In September the wind is very unsteady, veering between S.W. and W.N.W. in strong gusts. Heavy and continuous rain may be expected in this month.

In October the wind veers between West and North, and abates considerably in strength; the rain squalls are less frequent. Towards the end of the month the wind settles in the North, and the cold weather and fine season set in. At the bar of the Bangkok River, land and sea breezes generally prevail, veering by the East or West according to the monsoon.

The S.W. monsoon is scarcely felt close in shore, between Patani Cape and the Redang Islands, its course being interrupted by the high land in that neighbourhood. To the southward of Pulo Kapas it takes the direction of the coast, veering a few points on or off shore by day or night under the influence alternately of the sea and land breezes.

White squalls are said to prevail in the gulf, particularly in May.

Black squalls are frequent in the S.W. monsoon; they rise in the westward, accompanied by a heavy bank of clouds, and blow with great violence for a short time, and are frequently accompanied by heavy rain. Heavy gales are unknown in the gulf.

Astrology and Meteorology in France.*

Predictions in astronomy need astonish no one, for all know that they are the results of calculation. Thus, the motion of a planet and the time it will come to the meridian is foretold by calculation: the time of an eclipse and all its phases,—the periods of high and low tides,—and even the time of the return of comets are all predicted by calculation.

The *Connaissance des Temps*, published annually at least three years† in advance, the *Nautical Almanac* of Greenwich, and several other works of the same kind published in different countries for the use of astronomers and navigators, are in reality only collections of astronomical predictions for each year. We must add, in praise of mathematical astronomy, that these calculations, based on known phenomena and certain laws, are never wrong, though the period foretold is sometimes very distant.

Formerly, during the middle ages, and even in the beginning of the last century, astrology, which pretended to foretell the future by a mere inspection of the stars, prevailed almost over the whole world. It is said by Bailly "to have been the longest malady which has afflicted human reason, for it has had a reign of fifty ages."

At a period when natural philosophy was almost unknown, it was easy to suppose that astrology would include among its attributes the pretension of prophecying the weather, and even those catastrophes likely to spread destruction over the world. For this purpose, all that was required was to attribute good or bad influences to each planet, the motions of which were becoming known, and their conjunctions in certain groups of stars, investing it with a decided meteorological character. As, for instance, the Hyades (in Taurus), the Greek meaning of which signifies rain, and which was considered therefore an infallible sign of rain.

By giving such a basis to meteorology it was easy to invent a prophecy of the weather. It was only requisite to calculate the arrival of the fair or foul weather planets among the groups of stars, which led to such characters.

Such opinions have been held by the greatest men of past ages,—even those who, like Tycho Brahe and Kepler, have contributed most to the exactness of the science of modern astronomy.

One of the most illustrious physicians of the beginning of the eighteenth century, Frederick Hoffmann, in a dissertation called "The influence of the stars on the human body," constructed on the foregoing principles a complete theory on the art of foretelling the weather by merely inspecting the aspects of the planets. Thus, according

* This is the substance of the paper on this subject that recently appeared in the *Moniteur*.

† Similar to our *Nautical Almanac*. This is published four years in advance.

to this celebrated professor of the university of Halle, whenever Saturn was seen with another planet, in any position whatever, the air is condensed by it, and cold northerly winds are the result.

The conjunction of Saturn and Venus was thus considered to produce cold rain; the wind then coming from North and West. Jupiter was generally considered the cause of wind, with whatever planet he was in conjunction, especially in spring and autumn; so that tempestuous weather seldom came unless Jupiter was in conjunction with some planet or other. Among the rainy planets Venus ranked first, especially if in conjunction with Mercury, Saturn, or Jupiter. Mars in conjunction with the Sun in summer was considered to bring sultry, still weather. Mercury was considered very inconstant, and produced great variety of changes in the atmosphere in one day. Mercury was supposed to effect a change from fine to foul weather; but when with Jupiter wind was the result, and with Venus rain.

The astrological theory of Hoffmann was therefore considered to have improved somewhat on those of the ancient astrologers, for it taught that the particular action of each planet might be modified by its distance and position in respect of the Sun. Even the Moon was allowed her influence in retarding or accelerating effects, according to her several phases. The circumstances of position and the nature of climate were also considered among the incessant causes of change. In short, according to Frederick Hoffmann, there was nothing absolutely certain in the planetary influences, and their effects might be neutralised by all sorts of atmospheric circumstances.

At this period people were no less imbued with belief in astrology. Satisfied that astronomers knew well all the positions which planets would occupy in space, it was natural to consult them as to the future, and from this time the Academy of Sciences was besieged like the Sybil's Temple to consult the oracle. In fact, those who came to consult it concerning the future were so pressing in their importunities on the astronomers of the Academy, that Lieutaud was obliged to publish the following advertisement, which appears at the commencement of the *Connaissance des Temps* for 1705:—"No predictions whatever will be found herein, for the Academy has never acknowledged any authentic foundation for the rules given by the ancients for predicting the future by the aspects of the stars."

But, notwithstanding this ban upon astrology, people did not cease their importunities for predictions; and, finding astronomers would not pretend to read the future for them, were contented with those ridiculous prognostications which, even in the present day, contribute to the success of the almanacks of Mathew Larnsberg. It mattered little that these predictions were always false, they are still continued: in fact, it is a game of fascination.

About a century and a half after the advertisement of Lieutaud abovementioned, Arago (in the *Annuaire* of the Board of Longitude for 1846) found himself under the necessity of protesting against the predictions which were annually attributed to him both in France

and abroad. "Never," says he, has a word of the kind been pronounced either to my friends or in the office which I have held for more than thirty years. Nor has a line ever been published with my consent authorising any one to say that I considered it possible to predict the kind of weather we should have a year, a month, a week, or even a day in advance with any pretension to certainty." Arago used to say, indeed, that he could not even go into any society without being assailed by a thousand ridiculous questions, proving how deeply rooted was the belief in such predictions in men of education. "Shall we have a severe winter?" they would ask. "Shall we have a hot summer?" or "Will the autumn be rainy?" "We have had a long drought, or a long continuation of rain, when will it cease?" &c.

Arago has said, and with good reason, that prophecy of the weather will never form a branch of true astronomy. Indeed, with the exception of the sun, in regulating the seasons, and the moon, whose influence on the earth is exemplified in the phenomena of the tides, though its atmospheric influence is not so well understood, no sensible influence on the weather which we experience can be attributed either to star, planet, or comet, and therefore the cause must be looked for elsewhere.

The sun, by its position North or South of the equator, regulates the direction of the trade winds, which prevail within the tropics, as we see in the trade winds of the Atlantic and the monsoons of the Indian seas; but its direct influence is not so evident on the particular winds which occur for comparatively brief intervals in the temperate regions of our globe.

As to the influence of the moon on the changes of the weather, much attention has been devoted to it, but little is yet known in this respect. Sir John Herschel considers that the full moon dissipates clouds. But what is this in comparison with what we ought to know? It is evident that the amount of the moon's influence on the atmosphere is no less than that which it exerts on the sea, and therefore the atmospheric variations, not only at the time of the moon passing the meridian of a place as well as its inferior opposite meridian should be studied, but also those at the time of its greatest distance North and South from the equator.

We know that the moon moves in an elliptical orbit round the earth: consequently, its distance from our planet varies, and in the course of a lunar month at one time it is 101,000 leagues from it, that is, at the time of its apogee, and at another, when in its perigee, it is only 91,000 leagues distant. It seems impossible that this distance of 10,000 leagues should not produce very considerable variations in the state of our atmosphere; and if there be any ground on which a prediction might be ventured on the probability of a change of weather, there could not be a safer one than this, founded on such an extraordinary difference of distance between the moon and the earth.

At present, we cannot assign to changes of weather in the temper-

ate regions of our globe any more immediate cause than that resulting from a change in the direction of the wind. In France, with northerly winds the weather is cold,—not so when the wind is southerly; but it is dry when the wind is East, and wet when it is West. Winds, again, from intermediate points modify the weather accordingly:—thus, a N.E. wind is dry and cold; the S.W. wind is moist and warm. But amongst them all there is not one constant wind. All more or less depend on local and accidental circumstances, such as difference of soil, the meeting with other aerial currents of a mountainous country, the sudden cooling of a current of air, by which it falls into the lower atmosphere, &c. From such causes perpetual changes and perturbations arise, so as to prevent us from effectually foretelling the kind of weather that is to follow either a day or even a few hours to come.

Such predictions have for some time only been found in almanacks of the lowest character, mostly anonymous, and not worth the trouble of refutation, and it may be hoped soon to disappear. And yet this has not been the case, for during the last two years there has been a superabundance of these publications. Notwithstanding Arago said, in the *Annuaire* abovementioned, "Whatever may be the progress of science, truthful men, careful of their reputation, will not hazard a prediction of the weather," incredible as it may appear, we have seen serious and justly esteemed journals vying with Mathew Larnsberg in foretelling the weather as long as fifteen days or a month beforehand. These predictions concerning the cold of the month of January, which should give us frost to freeze up our rivers and cover them with crowds of skaters, have met with the fate they deserved. The lowest temperature of that month was on the 10th. The wind being from North, the thermometer was 6½° colder on that day in Paris at six o'clock in the morning; but on the next day the frost disappeared, and the weather became quite like spring.

Nothing is more difficult than to foretell the weather, even for a few hours beforehand. This was proved by the author within the last few days:—Saturday, 22nd January, in the morning, the temperature was low, the wind light, and the sky cloudy. This, however, did not prevent the sun from appearing for some time in the middle of the day. Going out in the afternoon, the sky being clear, no umbrella was taken; but, in spite of the favourable appearances, rain came down all the evening, and gave the author a wetting.

The next day (Jan. 23rd) the sky was the same as the morning before, except that it was clearer and the sun still brighter; and, again going into the fields, the weather promised so well that, in spite of the mischance the evening before, no umbrella was taken. The weather continued fine till four in the afternoon; but the sky then became cloudy, the wind fresh from S.W., and in one hour after the rain commenced; it increased more and more, so that on returning to Paris at nine or ten in the evening the author was again the victim of his want of fore-knowledge of the weather.

But, once more, on the following day (the 24th), in the morning

the state of the sky was again the same as that of the two preceding days, the temperature a little lower, the wind light and hazy, but with a bright sunshine, &c.; and again the author sallied forth. However, with two such previous warnings, an umbrella was this time his companion until returning an hour after evening. But there was no occasion even to open it, for not a drop of rain fell.

What conclusion may be drawn from these facts, except that in meteorology we must not reason by syllogism? If in argument the same facts always lead to the same conclusions, it must never be forgotten in predicting the weather, that two days beginning in the same manner often end very differently.

The Navigation of the Frazer River, and its Approaches.

Vancouver, February 26th.

I stated, for the information of our mutual friends, that no person should think of chartering a vessel from London, or any home port, for the Frazer River, on account of the difficulties and dangers of the navigation. Since the departure of last mail I have had opportunities of hearing the opinions of several of my friends here, many of whom are of opinion that ships will load at home direct for the Frazer; but I must say that those who hold this opinion are most of them landsmen. The naval officers who have been cruising about the place in screw steamers, be it remembered, admit that it is practicable for vessels of a certain draught *to enter the Frazer*, but that they should be towed over from Victoria by steamtugs, which they fondly imagine will be found here in great plenty after a time; but, in my humble opinion, the expences of a steamtug here, with engineers at £30 per month, sailors and firemen £11 or £12, and coals at £3 per ton, preclude the idea of any ship being able to pay the exorbitant charges of towage which must be asked in order to meet those expences, to say nothing as yet of the extra risk and insurance.

However, having heard the advocates *pro* and *con*, I determined, if possible, to take a trip to the Frazer and judge for myself as to the advisability of ships going from Europe direct for the Frazer; and my opinion, after seeing the place and its approaches, is decidedly against it. Having obtained leave of absence, I embarked. It will be sufficient for me to state that the navigation from Victoria to the entrance of the Frazer should only be attempted by a person possessing competent local knowledge, on account of the numerous islands you pass between. The surveys of H.M.S. *Plumper* have done much in discovering anchorages at convenient distances, which are always attainable by steamers; but, unfortunately, it frequently happens, on account of calms or light winds, that sailing vessels are unable to reach those anchorages, being all close in with the land, and they are thus

left to drift in the various channels at the mercy of the tides, which are at times, and in places, strong, and the only resource left to them in a dark night is to drop the anchor and veer cable to 30 or 40 fathoms, letting the anchor lie pendulous, in hopes it may hook something before the ship drifts into danger, which is by no means certain. This has been done frequently.

To my mind the officers of H.M. ships having always a steamer under their feet, underrate the difficulties and dangers in the navigation of this place; and when they speak of the facility and safety with which these parts may be navigated, I respectfully submit that such remarks would apply to steam-vessels alone.

We did not reach the entrance of Frazer River at the Sand Heads until the dusk of evening, and snow squalls combined, rendered it impossible to attempt the channel; and just before dark the captain, who is one of the best pilots of this coast, had a boat lowered to sound ahead of the ship, for, as he said, you would have 50 fathoms, and then be on shore. Presently the leadsman on board announced 15 fathoms. The anchor was let go immediately, but did not reach the bottom. I took hold of the lead-line; there was no bottom at 20 fathoms; but with the deep-sea lead-line we had 35 fathoms. Veered cable and brought the ship up, and then had 17 fathoms over the stern, and two ships' length more astern had four fathoms. I am thus particular in describing the anchorage at the Sand Heads, because it is all the anchorage you have. The sands are nearly perpendicular, and in our position as above we had the channel open, and were but just outside the edge of the sand. The only anchorage for ships in the vicinity is off Point Roberts, seven miles to S.E. of the Sand Heads. The holding ground off Point Roberts is good, but no shelter is afforded from the westerly winds; it is an exposed anchorage.

The next morning we entered the river through a narrow channel between the sands (the only one). The least water we had was $2\frac{3}{4}$ fathoms. At high water there would be but four fathoms, and as there must be a heavy swell here with westerly and northerly winds, in my opinion nothing drawing more than 12 feet should attempt the Frazer. All the lower part of the river, on both sides, is low land, covered with scrub and brushwood, and overflows with the freshets during summer. There is no place sufficiently elevated for a town site until some distance up.

The site selected for the new town and capital is a pretty rising ground on the North bank, immediately below the junction of the Pitt River with the Frazer. The Pitt River district is supposed to be rich in auriferous deposit, and, as some of them say, will "knock the Frazer River out higher than a kite." The new town is to be called Queenborough. Great disappointment is manifested by the settlers here that the town is not fixed at Langley, where it was at first intended to be placed, as barracks are already built there, church and court-house commenced, &c. But Langley is on the South side of the river, and only seven miles from the American lines, and this is a dis-

advantage which cannot be got over. Fifty-seven canoes passed up for the diggings a day or two before we arrived. The prospects of the diggers are brighter than ever. In one locality, the Bridge River, I heard they were making 150 dollars a day per man.

Little can be said of the country hereabouts just now, further than that the river winds its way through between lofty mountains, at this time sprinkled with snow, with a small patch of somewhat level land here and there on the river banks. I saw nothing at Langley to tempt me to prolong my stay; it was cold, cheerless, and comfortless. The town consists of a few wooden shanties and stores, among which flourishes the Caledonian Restaurant, the Columbian Exchange, &c., all of which, I am told, will have to be raised up on stilts and well moored, or be washed away by the freshets during summer. The H.B.C. schooner *Recovery* is lying alongside the bank, affording temporary quarters for the officers and men of the Royal Engineers until the barracks are completed.

Returning to Victoria, we stopped opposite the site of Queenborough to land the first lumber for buildings. The only houses there at present are two log huts for a party of men from the Royal Engineers, Captain Parsons, their officer, living in a tent close by,—not very comfortable, you will say, in a country where, during my visit, it was snowing every day and freezing every night. We wayed from Queenborough about one p.m., and I began to rejoice that we should be in Victoria early the next morning; but, alas! I was doomed to know something more of the Frazer than I bargained for. We unfortunately got aground on the sands when nearly out of the channel, and there we lay until ten p.m., when she floated off, and anchored in four fathoms. Fortunately there was little or no wind. Had there been much wind to cause a swell, we might not have come off so easily. A schooner above us, the *Island Queen*, which had been thirteen days coming down from Langley, took advantage of our position as a beacon, and dropped down until abreast of us, and then anchored; and there we left her. It will probably be another week before she reaches Victoria. Such is the Frazer and its approaches. Its advocates as a shipping port can make the most of it.

A small schooner, the *Pilgrim* of New York, got on the sands, and is now hove down in Victoria undergoing repairs at a great expence. The buoys which are laid down to mark the channel are not to be depended on, as the sands are continually shifting.

After what I have written above, I need not say again that my opinion is decidedly against any vessel going from home direct for the Frazer. I am only the more convinced since my visit that Victoria or Esquimault must be the depot. Victoria Harbour is safe for vessels of 18 feet. Vessels of that draught can at present lie afloat alongside the wharf, and more wharfage is in contemplation. The greatest drawback to Victoria is its being somewhat difficult of access, on account of sharp turns round the outer point; but the neighbouring harbour of Esquimault is one of the finest in the world, and will ad-

mit ships of any size at all hours; and it is in contemplation to build wharves along its shores, to admit vessels alongside, with warehouses attached to receive ships' cargoes. The distance of Esquimault from Victoria is four miles by sea, and about three miles or less by land.

Shipping Gazette.

MANNING THE NAVY.

The following circular, relative to the treatment of volunteers from the merchant service to the royal navy, has just been issued by the Admiralty:—

Sir,—Her Majesty having been graciously pleased to invite the sailors of the merchant service to join H.M. navy, in order that this country and its commerce may be adequately protected under the varying circumstances of a war in Europe, I am commanded by my Lords Commissioners of the Admiralty to acquaint you that the men who loyally accept the invitation deserve a cordial reception from the profession that has sought them.

It must be borne in mind that men, on first joining the royal navy, will have to renounce many old customs, and to adopt others which will at first be irksome to them, but they will learn to appreciate the order that is indispensable for the comfort and efficiency of large bodies of men, if the change in their habits be effected by the officers with temper and with judgment. If, on the contrary, an expectation prevail that these men will be able suddenly to accommodate themselves to the necessary restraints of a ship of war, and if a harsh attempt be made to compel their immediate conformity to these restraints, they will feel they have been unfairly and unwisely treated. Such a feeling would be most unfortunate.

These considerations alone would seem sufficient to secure to such seamen a proper solicitude for their contentment; but the impression produced upon the merchant seamen, on the present occasion, must have a very important influence in times to come. If they be not now cordially received and kindly treated, the unfortunate repugnance for the navy that has so long prevailed will be strengthened and perpetuated, to the irreparable injury of the national interests.

The presence of these merchant seamen in H.M. ships should not only be a source of present strength, but, by securing their regard for the service, it should be the means of spreading a similar feeling among the whole seafaring populations of our islands.

Those whose duty it may be to instruct the men should be firm, but they should also be patient and forbearing. The men should be taught the necessity for their exercises and to take an interest in them accordingly. Steadiness at quarters and precise firing are the first steps towards efficiency, and the next is a silent and seamanlike performance of other duties, without aiming at great rapidity.

The newly-raised men are to be at once properly clad, and informed of the regulations about clothing, and that they are responsible to the officers of their divisions for the condition of their kits. Each man is to be at once shown his mess-place and his sleeping berth, and where he is to stow his bag; and a hammock, clews, and lashing are to be given him. The usages of a lower deck, the customs and routine of the service, and the pay, pensions, and badges to which seamen are entitled, must be explained to him. He is to be told to whom he should apply in the event of his requiring advice or information, and that if he should have a complaint to make, he must represent it to the officer of the watch, and, if necessary, through him to the captain of the ship.

He should be shown how to sling and lash up his hammock, to wash and dress himself for quarters, to wash his clothes, and to scrub his hammock, so that they may be thoroughly cleaned; also how to stop them on the girt lines so that they may not be lost.

These things and others of the same character are to be taught without delay to men on first entry, in order that they may adapt themselves readily and with satisfaction to a ship of war.

It must be understood, however, that the foregoing instructions give no sanction to a relaxation of that discipline which should prevail at all times, and which is essential to the efficiency of the service, and the comfort and well-being of the men.

Having pointed out the spirit with which men who for the first time join the royal navy are to be treated, and having called attention to some details in illustration of the manner in which they should be initiated, my lords rely upon the officers of the fleet to turn to good account the opportunity that has been afforded for dispelling the aversion for the navy which the merchant seamen have conceived from traditional misrepresentations of the Queen's service.

Their lordships desire that you will direct the commanding officers of the ships under your orders to make known the foregoing instructions to the executive commissioned officers and officers in charge of decks, and the commanding officers are to take care that all the warrant and subordinate officers conform themselves thereto.

I am, &c.,

W. G. ROMAINE.

OFFICIAL INQUIRIES.—THE LOSS OF THE SHIP "ROSE OF SHARON."

The following is the report of Mr. Traill, the magistrate, and Capt. Robertson, R.N., Nautical Assessor, who held the recent inquiry into the stranding of the ship *Rose of Sharon*, Maxton, from Calcutta for London, off Cape Rozelle, near Cherbourg.

Greenwich Police Court, May 12th, 1859.

My Lords,—The investigation directed by your lordships respecting the loss of the ship *Rose of Sharon* has been made by me, assisted by Captain Robertson, R.N., acting as Assessor, and I have now the honour to transmit a report of the evidence, and of my opinion of the cause of the ship's loss.

The *Rose of Sharon*, a ship of 788 tons burthen, commanded by William Maxton, master and part-owner, sailed from Calcutta on the 16th of December last for London. Before she entered the Channel the weather became thick, and the last observation was taken on the 6th of April, and gave lat. 47° N., and long. 13° 47′ W. The wind was then about S.S.W., and the course steered from noon on that day was about East till 11h. p.m. of Friday, the 8th, when a light was observed bearing E.½S., a little on the port bow. This light, which was believed to be the Casquets, eventually proved to be the light on Cape Carteret, on the coast of Normandy. On sight of this light the ship was put about on the port tack, and a cast of the lead was taken, which gave 19 fathoms water. Had the master then examined the chart he would have perceived that this light could not have been the Casquets, there being no such soundings with similar bearings of the Casquets. So confident, however, was the master that the light seen by him was the Casquets, that he merely altered the ship's course to E.N.E., and kept that course, without taking any more soundings till about 2h. a.m. of Saturday, the 9th, when the ship went on shore near Rozelle Bay, to the southward of Cherbourg, and in a short time became a complete wreck. From this brief statement of facts, it must, I think, appear that the ship was lost by improper navigation; first, in holding on her course so long without having an observation or getting sight of land, there being nothing to prevent her from keeping close in with the English coast; and, secondly, in the neglect to take repeated soundings after the ship was found to be in 19 fathoms water, when her dangerous position might have been detected and, as the master very candidly admits, she might have been saved. For these reasons, I am compelled to say that the ship was lost through the default of the master, whose frank acknowledgment of his error is deserving of the most favourable notice. Captain Maxton has no certificate of competency; his certificate of service is sent with this report, also several testimonials in his favour. The master speaks in terms of great praise of the conduct of the chief mate, George Willis; also of the third mate, Edmund Wortley, and the crew of the lifeboat in exposing their lives for the rescue of those who remained to the last on board the ship, the master himself being one of the number.

I have, &c.,

JAMES TRAILL.

To the Lords Commissioners of the Privy Council for Trade.

I concur in the above report,

R. ROBERTSON, *Captain, R.N.*

[The Board of Trade have cancelled Capt. Maxton's certificate of service, and after the lapse of twelve months he will be allowed to go up for examination for a certificate of competency.]

LOSS OF THE AMERICAN SHIP "POMONA," OF NEW YORK.

The following is a copy of the report to the Lords Commissioners of Privy Council for Trade of the magistrates who held the inquiry at Wexford into the wreck of the *Pomona*, emigrant ship, on the Blackwater Bank:—

We, the undersigned justices of the peace for the county of Wexford, having been requested by an officer appointed by your lordships to inquire, in pursuance of the Merchant Shipping Act 1854, into the circumstances connected with the wreck of the emigrant ship *Pomona*, on Blackwater Bank, on the 28th of April last, beg to report that we proceeded to make such inquiry on the 7th and 9th inst., and after hearing the evidence, which we herewith transmit, and availing ourselves of the co-operation of Capt. Harris, Nautical Assessor to your lordships' board, submit the following as our report:—

The *Pomona*, an American ship, of 1,202 tons register, sailed from Liverpool on the 27th of April last, for New York. She had on board a cargo of general merchandise, 400 emigrants, a crew of 44 men, and four other persons, supposed to have been smuggled on board, making a grand total of 448, and of those only 24 were saved. All the regulations of the 18th and 19th Vic., called the Passengers' Act, had been complied with. We therefore infer that the ship was properly found, and in all respects seaworthy. The ship sailed on the morning of the 27th ult., with a fair wind, and between four and five o'clock that afternoon passed Holyhead at a distance of about ten miles. From thence the course steered was W.S.W. till a quarter to eleven p.m., when a light was observed about one point on the starboard bow. Shortly after this the ship was hauled to the northward and eastward, or away from the light, and was so continued till half-past four a.m., when the helm was put up, the yards squared, the course steered West, and in a few minutes the ship struck. Such is the brief account of the disaster which led to the loss of the *Pomona*. As often happens when these calamities occur, few survive to record the particulars, and those few, as in this case, for the most part illiterate seamen, devoid of all responsibility, and ignorant of the lights or position of the ship. We can, therefore, only form our conclusions from the evidence brought before us. The first position then in which we find the ship as deposed to by the third mate, (and that without any great certainty,) was between four and five p.m. on the 27th ult., then abreast of Holyhead, at a distance of about ten miles. The mate states that he thinks the course steered from that position was W.S.W., the wind being on the port quarter, and the rate of sailing might vary from six to seven knots. The course from the position assigned, ten miles off Holyhead, to the floating light on the Black-

water Bank is W.S.W., and the distance is about sixty or sixty-five miles. At eleven p.m. a light was seen about one point on the starboard bow; it was thought to be revolving, and was supposed to be Tuscar. Some misgiving as to its being the latter seems to have crossed the captain's mind, for after this light was seen the ship was hauled to the northward, apparently to wait for daylight. At half-past four a.m., it being then good daylight, but thick showery weather, the ship was kept away due West, and shortly afterwards took the ground. From the evidence it appears that the master was on deck during the first watch, for he gave the orders to haul the ship off on the starboard tack shortly before midnight. Again, he was on deck at half-past four a.m., when he himself gave the order to the helmsman to put the helm up and steer her West. But he does not appear to have been on deck during the middle watch, when the ship was drifting to the northward, with the helm a-lee. That morning, neither at daylight, nor at any time during the previous day, had the lead been hove, to verify the ship's position; and after the ship beat over the bank, the anchor was most injudiciously let go. Had this not been done it is more than probable the ship would have drifted on shore, a distance of about two miles, and many lives would have been saved.

The exertions of the Collector of the Customs and the Coastguard to render assistance were most meritorious, as also that of the lifeboat authorities at Cahore. It is to be regretted that on this occasion the shoalness of Wexford Bay and the state of the tides precluded any assistance being afforded by the large steam-vessels lying in the harbour when this disastrous shipwreck occurred.

Having maturely weighed all the circumstances which appear to us to have led to this lamentable shipwreck, we are of opinion that great blame is attached to the late master, Charles Merrihew, inasmuch as that when the light was seen, at eleven p.m., and supposed to have been the Tuskar, no soundings were taken to verify his position, and subsequently, after standing to the northward for four hours, he bore up due West before any indication was given, either by a light of the Blackwater Lightvessel, or a cast of the lead of his then position. We therefore find that the *Pomona* was lost by default of the master. Rumours have been circulated that drunkenness and disorder prevailed on board the ship prior to her loss. We desire to remark that the evidence adduced before us disproves the truth of such allegations.

CHAS. ARTHUR WALKER, J.P. and V.L.
JOHN WALKER, J.P. and Mayor.

I concur in the above report,
HY. HARRIS, Nautical Assessor.

Nautical Notices.

Particulars of Lights Recently Established.

(Continued from page 275.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
15. Andros Islnd.	Cape Tassa	37° 57·5′ N., 24° 42′ E.	Ffl.	708	30	For the Doro Channel.
16. Cape San Blas	Florida	29° 41·7′ N., 85°24·6′W.	R.	96	16	Est. 1st May, '59. Interval of revolution 1½ minute.
Texas	Corpus Christi		F.	77	14	Est. 10th Feb., '59.
17. English Bank	Bell Buoy	35° 16 S., 55°51·3′W.				

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

Antipodes Island.—*Incorrect Position on Charts.*

The following on the position of Antipodes Islands are important, and the near accordance of the two accounts seems to establish a claim to be considered free from any error of importance that could scarcely have been expected. It is very remarkable that these lonely isles should have remained so long incorrectly placed on the chart, which here is sufficient authority now to correct.

Sydney, N.S.W., Nov. 10th, 1858.

Sir,—As that, to you, far off spot, Antipodes Island, appears to be incorrectly laid down in some charts, I enclose you a note I received on the subject from Captain Benjamin Darley. In a previous conversation with that gentleman it transpired that he had made this island sooner than he expected; and as such an error might be productive of fatal consequences, I requested him to get me the particulars, that I might forward them to you.

The error is the more unfortunate because, except in the case of whalers, the island is never met by vessels coming from the eastward.

I may add that Captain Darley may be implicitly depended on. He is a magistrate of the territory, and a member of the Pilot and Steam Navigation Board of this port.

I am, &c.,

Henry T. Fox.

To the Editor of the Nautical Magazine.

Sydney, 3rd November, 1858.

My dear Sir,—I find on looking over my old log that I sailed in the *Eweretta* from this on the 24th March, 1846, for London, and on

the 4th of the following April, at daylight, I made the island of Penantipode, much sooner than I expected. Fortunately it was a fine clear day and smooth sea, so I was enabled to take several good sets of lunars, which agreed with my two chronometers (that I proved to be correct afterwards, on making Diego Ramirez Island,) and placed Penantipode Island in lat. 49° 40′ S., long. 178° 40′, which is exactly one degree of longitude West of the position laid down in the charts.

It is high and barren, about fifteen miles in circumference, with six or seven small islands round it, lying a short distance off, and may be seen in clear weather some thirty miles distant.

Yours, &c.,

BENJAMIN DARLEY.

H. Fox, Esq.

Sir,—I beg to submit to your notice the undermentioned report. Having followed the sailing directions of a voyage from Melbourne to London, *viâ* Cape Horn, I determined to steer what appeared to me the most direct passage. On the 30th of January, 1859, at noon, our position, by good observation, was in lat. 38° 55′ S., long 144° 6′ E., with the wind at S.E., strong, Cape Otway bearing W.b.N., distance 25 miles, distinctly visible. As the ship approached the southern latitudes, the wind veered to the westward, and on the 7th of February passed half way between the Snares Rock and the Auckland Islands, blowing a heavy gale; bar. 28·80.

From noon of the 9th February (morning and afternoon sights to correspond), in lat. 49° 26′ S., long. 177° 5′ E., I shaped a course to pass to the southward of the Antipodes Island, allowing the position assigned, and calculated the difference at noon between our latitude and longitude and that of the island. The result proved by bearing and distance 84° S., 105 miles E. Consequently we did not expect to approach the island till 11h. p.m. However, at 6h. 30m. p.m. the look-out forward reported icebergs ahead. I directly made use of a powerful telescope, and distinctly observed the sea breaking high about four miles on the starboard bow, bearing E.S.E., the weather misty, with a fresh westerly breeze. We shortened sail and altered our course to N.E., and followed along until we discovered the icebergs proved to be *insula firma*—the Antipodes! But instead of one, as described, we numbered four detached islands, with clear channels between, as far as we could judge by their appearance through our telescopes. At 7h. 10m. p.m. the ship was abreast, and the islands in one, bearing South 1½ mile distant. Bore away and stood East, having run since noon of the 9th February 63 miles, course E.½S. by compass, variation 16° E. Therefore, according to our calculations, the islands are placed 42 miles too far to the eastward. From the uniform rate and correctness of our chronometers, I am strongly of opinion that we made no mistake.

These islands do not appear to be noticed by navigators, although much in the way of the homeward-bound. They lie nearly North

and South, and extend over a space of about 4½ miles. The highest part of these islands is about 600 feet above the sea; and from the reason of their being immediately in the track of ships steering for the Horn, deserve further attention, and a more correct position assigned to them.

I am, &c.

W. P. STEVENSON,
Commanding ship *Maidstone*.

To the Editor of the Shipping Gazette.

Long. by my chronometers, mean of three	178°	40′ E.
Horsburgh	179	30
Raper	179	42
Norie	179	40

SWATOW,—*China Sea.*

Owing to the great increase of shipping in the port of Swatow, and looking back on the late accidents which have happened in the vicinity, we think that a few hints, accompanied by sailing directions, might be of some use to shipmasters visiting that port.

Vessels bound to Swatow from the northward in the N.E. monsoon, should, on making the Cape of Good Hope, steer for it until Bill Islet becomes visible from the deck: steer then for Bill Islet passing it to the N.E. about one mile, then steer for Sugar Loaf Island until you bring Bill Islet on with the Cape, that being the old leading mark by which vessels of a heavy draught of water have successfully entered the port. Keep this bearing until the centre of Sugar Loaf bears S.W. a N.W. course will then take you clear, passing the lighthouse on Double Island about two cables' length; a mid-channel course (passing the remaining part of the first tier of fishing stakes on the North shore on the starboard hand) will take you to the anchorage of Swatow.

Vessels running down with night coming on will find a safe anchorage by bringing Clipper Point of Namoa to bear N.W. two miles.

In moderate weather, vessels waiting for tide or other unavoidable causes, might anchor with Bill Islet bearing West distant two miles.

The tides in crossing the straits of Namoa set N.E. and S.W. Vessels in light winds should guard against being set into the straits. The flood tide off Bill Islet sets nearly N.W. and S.E., and through Sugar Loaf and Double Island Channels East and West, which should be allowed for in a light breeze when opening these passages.

The wreck of the *Margaret West*, if any portion still remains, lies about half way between the lighthouse and the eastern extremity of Sugar Loaf, by following the former directions you will pass about two cables to the N.E. of same.

The gale of 21st of September has not in any way altered the

channel. The Joachim Bank is gradually extending to the S.E. With Double Island bearing North by West, and Bill Islet South, there are only 2¾ fathoms.

The tides inside Double Island are very irregular, chiefly from local causes; but in ordinary weather it is high water full and change at three p.m., rise and fall of spring tides from 8 to 9 feet. Any vessel from 13 to 14 feet draught of water, with a fair wind, could, in fine weather with no ground swell on, enter the port at any time of tide with perfect safety.—*Overland Register.*

Charger Shoal.

Captain Luther Heard, of the ship *Charger*, of Boston, while on the passage from Calcutta to Boston, is stated to have discovered a shoal, of which he makes the following report; but we should like to have seen some of the sand which might have been brought up by the lead.

January 31st, 1859, at 4h. 20m. p.m., fine clear weather, ship going at the rate of ten knots per hour, saw discoloured water under the bow. Immediately ordered the man at the wheel to luff. Called out to my chief and second officers, who were both forward at the time, to look at the shoal, then about one-third of a mile to leeward, which they saw immediately, and went upon the forecastle to see if there was any more shoal water, but reported all clear.

The above shoal appeared to be of clear sand, stretching N.W.b.W. and S.E.b.E. about half a mile, and one-third of a mile wide; and, as near as I could judge by the appearance of the bottom, there were 10 to 12 feet water on it. It lies directly in the track of vessels passing the Cape homeward-bound, in lat. 34° 56′ S., long. 17° 40′ E., and I consider it a very dangerous shoal. There is no doubt about it,—it is there. I had a good view of it myself, also my officers. Had I not luffed two or three points immediately on discovering it, I must have gone on the southern edge of it.—*New York Herald.*

Charts, *&c., Published by the Hydrographic Office, Admiralty, in May,* 1859, *and Sold by the Agent, J. D. Potter,* 31, *Poultry, and* 11, *King Street, Tower Hill.*

West Coast of North America, Fraser River, from Langley to Yale, Captain Richards, R.N., 1859, (1s. 6d.)

China Sea, sheet 3, Cam-Ranh Bay to Hongkong, various, 1859, (3s.)

China Sea, sheet 4, Mindoro Strait to Hongkong, various authorities, 1859, (3s.)

Australia Directory, noted in the May number, should be 5s., instead of 3s. 6d.

East India, Australian, and New Zealand Lights, corrected by Commander Dunsterville, R.N., to June, 1859, (6d.)

Admiralty, 21st May, 1859.

New Books.

THE LAW OF CONTRABAND OF WAR, *with a Selection of Cases, &c., &c.—By F. T. Pratt, D.C.L., Advocate of Doctor's Commons.* Benning, Fleet Street.

At a late moment we have received this valuable work, which gathers importance every day from the state of the times.

On the article of coal, which has occasioned so much solicitude of late as to have been the subject of a correspondence with the Government, there will be found the case of the *Young Andrew*, given by Dr. Pratt as the only one on the subject of coal that was brought before the Admiralty Court unreported at the time. And reference to the same subject will be found in extracts from former treaties with Denmark, and also France, by which it was stipulated that the article of coal should not be considered as contraband.

The work is one to be consulted on these subjects at the present time, and will be found most useful, the reference being much facilitated with a good index. It is one to be commended to the attention of our readers.

THE LATE LIEUTENANT HARRY RAPER AND CAPTAIN K. B. MARTIN.

Our friends have been dropping around us to their last resting-places. Raper and Martin are gone,—the former earlier and the latter after surpassing the period assigned to the lot of man in this life,—leaving two gaps honourably and creditably filled to be made good in society.

Lieutenant Harry Raper died recently at Torquay, well known by naval officers not only for his attainments in science as the author of the *Practice of Navigation*, but no less esteemed as the kind and considerate, steady and manly friend of those who enjoyed that friendship.

Mr. K. B. Martin, well known to many as the excellent Harbour-Master of Ramsgate, died there on the 20th of March; no less esteemed as an excellent officer in his station, a zealous friend, and a worthy representative of one of the old school of British seamen.

This journal can boast the contributions of both, full of desire for the honour and welfare of British seamen, and the memory of both claims our deep and heartfelt sorrow.

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

JULY, 1859.

The Strait of Gibraltar.—*Winds and Weather.*

The limits of the strait may be considered to include the European coast from Cape Trafalgar to Europa Point, and the African coast from Cape Spartel to Point Almina of Ceuta. The prevailing winds in the strait are either from the eastward or westward, and at each end of it are influenced by the trend of the coast on both sides. Thus, when the wind is from the eastward it varies to N.E. and S.E., and when from the westward it varies to N.W. and S.W.

It appears from observations made at Gibraltar that from the year 1810 the climate of that place has undergone a change, from the prevalence of westerly winds over those of easterly.

The following table is the result of observations made at Gibraltar and Cadiz during the six years from 1850 to 1855, and will show the number of days of easterly and westerly winds of each month of the year, these being the average of six years.

From the table it is evident that easterly winds at Gibraltar prevailed during the months of July, August, September, December, and March; while at Cadiz easterly winds prevailed only in December. It also appears that at Gibraltar and Cadiz, only a short distance apart, very different winds were blowing at the same time. Vessels are wrong, therefore, when bound to the West coast of Africa with westerly winds, to come to Gibraltar for an easterly wind to enable them to communicate with places on that coast. It would appear also that Cadiz, or even Tangier, would be better places for judging the weather of these parts than Gibraltar.

Days of Easterly and Westerly Winds.

Months.	Gibraltar. Days of Easterly Wind.	Gibraltar. Days of Westerly Wind.	Cadiz. Days of Easterly Wind.	Cadiz. Days of Westerly Wind.	Gibraltar Days of Variable Wind.	Cadiz. Days of Variable Wind.
January ..	8·2	20·6	6·7	12·3	2·2	12·0
February..	11·2	16·1	8·8	10·6	0·7	8·6
March	16·0	13·6	7·7	16·1	1·4	7·2
April	12·2	17·3	10·2	13·8	0·5	6·0
May.....	7·3	23·3	4·4	20·2	0·4	6·4
June	11·8	16·6	7·7	18·5	1·6	3·8
July	18·5	12·2	6·9	19·9	0·3	4·2
August ...	19·5	11·0	11·8	15·5	1·5	3·7
September.	17·3	12·6	11·0	15·7	0·1	3·3
October ...	12·7	17·3	9·8	14·2	1·0	7·0
November .	10·5	17·8	8·5	11·4	1·7	10·1
December .	15·0	13·5	13·4	7·0	2·5	10·6

It would be very desirable to have simultaneous observations of the weather at Tangier and Gibraltar, with the view of ascertaining whether the same winds at Cadiz and Gibraltar prevail at the same time in the S.W. part of the strait. Captain Jose Luyando, of the Spanish Royal Navy, made observations at Tangier in 1825, which, compared with those of Gibraltar, show a considerable difference. In 1825 it appears that at Tangier there were 195 days of westerly winds, 134 days of easterly, and 36 days of variable; while at Gibraltar there were 180 days only of westerly winds, and 185 days of easterly.

From these results we may presume that the proportion of westerly winds increases at Tangier, while that of easterly winds decreases. But easterly winds at Tangier are always prevalent in July, August, September, March, and January. Yet a great many more observations are required to come to safe conclusions as to the winds of the strait. Certain it is, however, that calms are very rare, and the wind often strong.

The months of February and March are the only two that are generally bad for the navigation of the strait. About the end of October and November sometimes bad weather prevails in the strait, for it is the time of the short rainy season, which lasts from fifteen to twenty days. In the winter months of January, February, and March S.W. and S.E. gales are frequent, shifting to West and N.W.

These gales, however, sometimes very heavy, do not last; but in February and March they follow each other at very short intervals. In the fine season, from April to December inclusive, and even January, easterly and westerly winds prevail according to localities, under peculiar circumstances.

Peculiarities of the Winds on the Coast from Cadiz to Trafalgar.

—On the coast between Cadiz and Cape Trafalgar easterly winds come in squalls, with a clear sky overhead. These are dry winds. Some small scanty white clouds are seen *(cirrus)* occasionally very high, but are soon dissipated; a white mist hangs over the land, thickening as it nears the horizon, and this state of things continues while the easterly wind lasts, and even indicates its approach.

The absence of dew and a bank of mist at sunrise and sunset are certain indications of an easterly wind.

In the fine weather season, while the easterly wind prevails, it is generally stronger and more persevering than the westerly wind. It will last for over a fortnight, blowing hard all the time. The native seamen say that it always blows for periods of three, six, or nine days. But, generally speaking, easterly winds will get up with considerable strength in a very short time; sometimes they freshen up to a gale in a very few hours.

In shore these winds often come in violent squalls, scarcely felt on deck, but severely so overhead and about the masts and rigging. They are very sudden in their visitations, without any warning, are hot, and leave off abruptly. But off shore these peculiarities are lost, and the breeze is steady and gradually goes down.

At Cadiz easterly winds (called the Medina) often blow strong; but in April, instead of being hot and dry, they are accompanied by heavy black clouds, which often give rain and hail. They come in squalls and often increase to gales. They will slacken in the evening to freshen in the morning; in the course of the day they are strong, and at night will come occasionally in sudden gusts.

Westerly Winds.—Still on this coast S.W. winds are the most dangerous. They are generally announced by a fall in the barometer, and commence from the southward. Very different from easterly winds, they take a certain time to become S.W., from whence they blow hardest. Like the S.W. winds of the bay of Biscay, they shift suddenly to West, and even to N.W.; and if they continue at N.W. the weather becomes fine, but the squalls are heavy and sometimes stormy. These winds continue strong and generally go down at North. This character of the westerly wind specially applies to the winter. In the fine season of April and May these winds are generally moderate, bringing fine weather, although the sky may be overcast.

Peculiarities of the Wind in the Strait of Gibraltar.—In the strait of Gibraltar the easterly winds have peculiarities very different from what is found with the same winds on the coast between Cape Trafalgar and Cadiz to the northward. They come in squalls near the land, but in the strait are uniformly strong. In shore, and principally in the bays, a dead calm prevails both morning and evening; or the wind is light near the land while outside it is blowing hard, especially in the middle of the strait, and one cannot tell from the anchorage the weather which prevails in the strait.

Easterly winds, instead of being dry, as they are on the coast between Cadiz and Trafalgar, are often very moist. They are attended

with the mists of the shore, and the thicker the mist the harder is the wind. An abundance of dew, a mist over the land, and particularly spreading over the heights of Gibraltar—and especially over Apes Hill,—are all indications (and almost certain ones) of an approaching easterly wind; and they continue while it lasts.

During the fine season easterly winds are seldom attended with rain in the strait; but as they always bring more moisture to the eastern entrance of the strait than to the western, it often happens that the collection of vapour which they form on the heights of Gibraltar and Apes Hill occasions rain at the foot of these mountains while there is fine weather in the strait. Again, in the fine season, and particularly in June, if, after a strong easterly wind, large white clouds are seen collected about the land in large masses, and if the S.W. or westerly wind comes in light airs, and a thick fog bank is formed in the western part of the strait, it gradually gains on the land, and soon envelopes the whole strait. These fogs are sometimes as thick and wet as those which are met with on the coast of Newfoundland in the month of August; but they are only of a few hours' duration in the strait, and disappear as rapidly as they form.

Westerly Winds.—Westerly winds in the strait are generally moderate; in which case the sky is clear, and the land clear and remarkably distinct. If they freshen, the sky soon becomes overcast and squally, with rain, attended by a considerable sea in the strait. Nevertheless, it may be said in general that westerly winds in the fine season (excepting a breeze now and then from the S.W., which will haul to West and N.W., and of very short duration) bring fine weather for navigation, and it is principally in October, November, and December that a gale occasionally comes from the westward.

Westerly winds, which are attended with much moisture at the western entrance of the strait, are mostly dry at Gibraltar. And when the heights of Gibraltar and Apes Hill, after being covered with mist by a continuance of the easterly wind, become clear and conspicuous, it is a tolerably certain sign of a westerly wind being near.

Changes in the Strength and Direction of the Wind in the Strait.—In the fine season easterly winds in the strait are always fresh, while westerly winds there are mostly moderate. But easterly or westerly winds in the strait have this peculiarity, that in the vicinity of the coast they follow its direction. Thus, when the wind is due West in the strait, near the coast of Spain it becomes N.W., while near the African coast it is S.W. In like manner, easterly winds in the strait draw to the N.E. near the coast of Spain, and to S.E. near the coast of Africa.

But a remarkable fact which has been observed, and which is, perhaps, general in the strait, is that as the wind penetrates into the strait, it becomes stronger as it reaches its narrowest part. Thus, although the easterly wind may be light between Gibraltar and Ceuta, it blows hard between Tarifa and Point Ciris opposite, as well as in all the western part of the strait. And in the same manner

westerly winds which are moderate between Trafalgar and Cape Spartel attain their greatest strength South of Tarifa, and preserve it in all the eastern part of the strait,—a peculiarity of which it is important the navigator should be informed.

S.W. Winds.—In the bad season, that is in February, March, and April, westerly winds come in squalls, and are attended with heavy rain. In this season, also, easterly winds set in and veer S.E., accompanied by torrents of rain. The weather with them is nearly always murky, and the sky overcast.

The worst winds of the strait are the S.W., and in the squalls by which they are attended it changes suddenly to West, to N.W., and even to North, and sometimes N.N.E. When they remain between North and West, they generally lose their strength. The squalls which they bring generally are attended by rain and sometimes by hail. Between them there are intervals of fine weather, with moderate wind, and if this settles between N.W. and N.E. it goes down, and it clears up entirely. But if, on the contrary, after suddenly changing to N.W., the wind backs round again to S.W., it mostly redoubles its strength and brings rain in abundance.

N.W. and N.E. Winds.—N.W. and N.E. winds changing by the North are very rare in the strait; but when they come and are moderate they are attended with fine weather. In the bad season they blow with considerable force, but the pilots say that although N.W. winds may blow hard outside, they are not much felt in Tangier Bay. In the bad season N.E. winds frequently bring rain, and when they veer to East or S.E. they generally freshen to a gale.

S.E. Winds.—The S.E. is the rainy wind of the strait, and is called the Levanter. These winds come with squalls, shifting suddenly to N.E., and even to North. In these changes they blow hard all the time; but sometimes in changing to N.E. they moderate; but if they return again quickly to East or to S.E. the bad weather will continue.

Barometer.—In the course of the summer the changes of the barometer are almost nothing in the strait, but in winter time they seldom deceive. When it falls, wind or rain may be expected. With northerly winds from N.N.W. to N.N.E. it is generally high, and keeps so with fresh N.E. winds, even when they bring rain. But as soon as the wind has any tendency to the southward it falls. S.W. and S.E. winds, being those which generally bring bad weather in the strait, are announced by a considerable fall in the barometer. But frequently this fall is only on account of rain, for, generally speaking, these changes of the barometer are more frequently followed by rain than by wind.

Rain.—By observations made at Gibraltar and Cadiz, there appears to be considerable difference between the two places, as much in respect of rain as wind. For while at Gibraltar an average of sixty-eight days rain are looked for every year, at Cadiz they have only eighteen. The following table shows the number of days of rain for each month of the year at the two places from a series of six

years' observations. Another column is added of the observations made on board the *Phare* for a different year; from which will be evident not only the great difference between the two places, but also that between the observations in the strait, and how much the three series for the same month differ from each other.

Number of Days on which Rain has Fallen.

Months.	Gibraltar	Cadiz.	Afloat.	Observations.
January ..	9·1	2·5	15·5	Afloat at the anchorage
February..	7·1	1·6	18·0	
March	6·2	2·0	12·0	of Caraca, or Cadiz,
April	10·1	1·7	4·3	
May.....	6·1	1·6	3·5	from 17th February to
June	1·8	0·2	0·7	
July.....	0·4	0·0	0·7	20th April. On other
August ...	0·9	0·2	0·2	
September.	2·9	0·7	2·5	days in the strait or its
October ...	5·7	2·0	3·0	
November .	9·5	3·8	9·0	vicinity.
December .	8·8	2·0	0·7	

It will be seen by the table that the most rainy month at Gibraltar was not the same at Cadiz. It is certain that often with S.W. winds rain falls at Tangier while it is dry at Gibraltar; and often while easterly winds bring rain in the eastern part of the strait, it does not reach the western part.

It is generally considered that there are two rainy seasons in the strait. One of them, which commences sometimes in November and sometimes in December, or even in January, seldom lasts more than fifteen days. The weather afterwards becomes fine before the heavy winter rains, which sometimes last into May. In the years 1854 and 1855 the little rainy season occurred in November; December was dry; the rains recommenced in January and lasted through the first fortnight of April.

The months in which stormy weather is most common in the strait are those of September and October. Storms are not so common in April, May, and November, and rarely happen in the other months. They most frequently occur in the afternoon or at night, when the weather is very uncertain and the wind very variable. Heavy gusts of wind, but of short duration, are experienced from opposite points, as from East and West, and clouds are seen, of different elevations, pursuing opposite directions, and this is a tolerably certain sign that the evening will not pass over without a storm.

In the months of September and October the pilots affirm that about fifteen or twenty miles outside the strait squally weather is met, with rain and most frequently attended with gales. The squalls,

they say, are attended with a considerable quantity of rain and intervals of fine weather, with calms or light winds. But it is prudent for ships under sail to be prepared for this weather, for when the wind of these squalls is strong they assume something of the character of whirlwinds, and shift rapidly through four, six, or even eight points, blowing all the time the harder as the changes are more rapid and considerable.

Observations of the Barometer and Thermometer.—The following table, which presents the mean results of six years' observations at Cadiz, will convey an idea of the movements of the barometer and thermometer in the strait of Gibraltar.

Months.	Barometer.			Thermometer.		
	Max.	Min.	Mean.	Max.	Min.	Mean
				°	°	°
January ..	30·40	29·49	30·08	68	30	49
February..	30·40	29·96	30·20	72	41	55
March	30·32	29·60	29·88	67	45	57
April	30·20	29·49	29·88	82	50	64
May.....	30·08	29·57	29·88	78	50	64
June.....	30·08	29·77	29·88	82	60	68
July.....	30·08	29·80	29·88	90	62	74
August ...	30·08	29·80	29·88	87	58	75
September .	30·16	29·69	29·88	82	59	72
October ...	30·08	29·60	29·88	82	47	64
November .	30·20	29·69	29·88	72	41	59
December .	30·40	29·88	29·88	65	37	53

In the strait of Gibraltar, besides the sea produced by the wind then blowing, the ocean swell is also felt from beyond the strait, resulting from the wind prevailing there. But in proportion as these long seas penetrate into the strait, and especially if from the westward, they assume the direction of the coast and run very differently from the direction they take from the wind outside. Thus, with westerly winds varying from S.W. to N.W., in the bays on the African coast the sea appears to come from N.W., although the wind outside is S.W. The same with easterly winds varying to N.E. and S.E.: on the coast of Spain the sea comes from S.E., although often outside the wind producing it is N.E. The consequence is that neither on the African coast nor on the Spanish coast is there any really quiet anchorage where shelter is to be had. Another consequence is that if one attempts to judge the direction of the wind outside from the direction of the sea, one is led into all kinds of mistakes.

Whenever the ocean swell is observed in the straits as in the bays, whether from the N.E. or S.E., it is a sure indication of an approaching easterly wind; and the same may be said when it comes from N.W. or S.W. of a wind approaching from the westward.

While under sail in the strait with an easterly wind it is necessary to be prepared for squalls, which are sometimes very heavy to the westward of the rock of Gibraltar, in the vicinity of Apes Hill, as far as Point Ciris, off Malabata, and in Tangier Bay, as well as to the West of Tarifa and anywhere near the coast of Spain between Cape Trafalgar and Cadiz.

In like manner, with westerly winds, squalls must be expected to the eastward of the rock, especially near the West shore of Algeciras Bay, crossing from the bay of Getares, and approaching Apes Hill, also in the bay of Benzus and Ceuta, as well as on the whole coast between Ceuta and Tetuan.

(To be continued.)

TEMPERATURE OF THE SEA AROUND THE COASTS OF SCOTLAND IN 1857 AND 1858.—*By James Stark, M.D., F.R.S.E., &c., &c.*

Many interesting problems depend for their solution on a good and systematic series of observations on the temperature of the sea around our shores. Not only have the facts which are to be thus ascertained the strongest bearings on the character of the British climate, but also on the phenomena attending the great oceanic currents which circulate the mass of waters in the northern Atlantic. It would be the height of affectation to assert that two years' observations, however carefully conducted, could thoroughly determine any one point; still it is only by making known the facts which have been ascertained, and pointing out their general bearings, that the truth will eventually be arrived at.

Impressed with the belief that the meteorology of this island was incomplete without determining the varying conditions as to temperature of the sea around our shores, the Meteorological Society succeeded in getting several stations established around our coasts; and though the observations made at all these stations are not quite complete for every month, still some facts were ascertained which enable us to deduce some interesting, and, it must be confessed, quite unexpected conclusions.

It may be remarked, that, at the very outset of the inquiry, unexpected difficulties were met with in ascertaining the true temperature of the sea. In order to procure as much uniformity as possible, instructions were issued to the effect that the temperature should be taken at the time of high water, six feet below the surface, from the ends of projecting rocks or piers, and as distant as possible from a river's mouth. As several of the observers lived at some distance from the sea, all these directions could not be complied with at every observation, as they were unable to visit the sea always at the time

of high water. The result has been that the mean temperature of the sea around Scotland has been slightly overrated, perhaps at least to the extent of half a degree of Fahrenheit's scale on the mean of the year. This observation applies with especial force to the summer and autumnal observations, seeing that it was found that in many of the bays the temperature of the water which came in with the tide was from 3° to 7° *colder* than the water which remained in the bay at the time of low water. This was manifestly occasioned by the water in the bay having acquired an increased temperature from the heated shore; and as the heated water clung to the shore during the recess of the tide, the heated water remained in the bay at the time of low water.

In consequence of this peculiarity erroneous conclusions will be inevitable in comparing the mean temperature of one station with another, seeing that a difference might result from local circumstances quite unconnected with general influences. For instance, in Stornoway Bay, when the sun's rays were powerful, the sandy bottom and sheltered site had the effect of causing the mean temperature of the sea there to rise to a mean of 55° during May, 1857; while at three other stations on the West coast, but in much more open situations, viz., at Tobermory, Ushenish, and the Mull of Cantyre, the mean temperature of the sea during the same month was respectively 47·8°, 47·7°, and 47·2°. As the land influence, however, seems to be entirely in favour of *heating*, not of cooling the sea, it may be safely assumed that the sea temperatures are, at all events, not underrated, and yet are not so far from the truth as to prevent their being used for the purposes of general deduction.

As it is important to compare the mean temperature of the sea with that of the air and solid land, the following table exhibits the mean temperature of the air over Scotland reduced to the sea-level, the mean temperature of the soil twenty-two inches below the surface, and the mean temperature of the sea around Scotland and its islands during the year 1857:—

Months.	Air.	Land.	Sea.	Months.	Air.	Land.	Sea.
January ...	36·4	39·0	41·3	July	58·7	58·7	54·0
February ...	40·0	38·7	42·8	August	60·7	59·7	56·7
March	39·9	40·0	43·1	September ..	56·8	57·8	56·9
April	43·4	43·2	44·2	October	50·3	53·4	53·6
May	50·5	48·2	48·4	November ..	44·4	48·8	50·7
June	58·1	55·7	52·8	December ..	45·6	44·6	47·7
				Year ...	48·7	48·98	49·3

It thus appears that the mean temperature of the air, the land, and the sea, differed so little that the mean temperature may be assumed

to be the same during the year. Even taking the results as absolute, the mean temperature of the sea was only 0·6° higher than that of the air, and not much more than 0·3° higher than that of the solid land.

But the above table allows us to deduce other conclusions. It will be seen by it that the minimum mean temperature of the air and that of the sea were attained in January, though the solid land, at the depth of twenty-two inches from the surface, continued to lose heat till February. After this, in proportion as the temperature of the air rose, so did that of the sea and of the land, till August, when the air and solid land attained their maximum mean temperature. As the sea, however, did not attain the same mean temperature as the land during August, it continued to increase in temperature so long as the mean temperature of the land exceeded its temperature, so that the maximum mean temperature of the sea was not attained till September. After this the mean temperature of air, land, and sea fell together till the close of the year.

These few facts, then,—viz., that the mean annual temperature of the air over Scotland, of the soil of Scotland, and of the sea around its coasts, are within a fraction of a degree of each other; that the highest and lowest mean temperatures of all are attained about the same periods, the slight difference in time being clearly due to the peculiarities of each with regard to the absorption, radiation, and conduction of heat; and that the temperatures of all these rise and fall with one another,—these few facts, I say, lead to the conclusion that their temperatures must be under the influence of the same agency, whatever that agency be.

Fortunately for science, Sir James Matheson, Bart., interested himself in these sea researches, and induced Captain Henry Otter, of H.M.S. *Porcupine*, and then Mr. M'Donald at Bernera, to engage heartily in the cause. Captain Otter accordingly instituted an elaborate series of observations in the Sound of Harris, embracing not only the temperature of the sea, but that of the air, the direction and force of the winds, the state of the tide, the density of the water, and the barometric pressure. From four to eight observations were made daily, and the following are the most important of the results which were obtained:—

As the observations on the temperature of the sea were made at a place more free from land influence than any of the other stations, the result was, that in the Sound of Harris the sea attained its maximum temperature during August, at the very same time that the air attained its maximum temperature. Thus the mean temperature of the sea at the Sound of Harris was 59·5° during August, whereas that of September was 56·8°. But the correspondence between the temperature of the sea and that of the air was more strongly marked than by a merely monthly approximation; for these observations show that the temperature of the sea continued to rise regularly with that of the air, attained its maximum almost the very same day that the air attained its maximum, and thereafter fell regularly with the

fall of temperature of the air. Nay, further, so close was the connection between the rise and fall of temperature in air and sea, that, whenever a warmer day or two occurred, during which the mean temperature of the air rose above what it had been for several days, the temperature of the water was observed to rise in nearly the same proportion; so that, within certain limits, even the variations in the mean daily temperature of the air were noticeable in that of the sea. Thus the warmest days in August were from the 20th to the 24th, when the mean temperature of the air in the Sound of Harris rose to 68·3°. On the 21st the sea there attained its highest temperature; the mean of four observations, taken at nearly equal intervals day and night, giving the temperature of 62·5°. The mean temperature of the sea during the previous week only averaged 58·2°.

During the month of September, the temperature of the air slowly but pretty regularly fell from about 62° to 57°; and the temperature of the sea kept almost exact pace with it, falling from 59° to 55°.

The first week of October proved to be a very cold one, the mean temperature of the air falling to 47·5° on the 6th; and the temperature of the sea, falling of course more slowly, was on the same day so low as 51·6°. Warm weather set in after this; the temperature of the air rose to a mean of 55° for several consecutive days, and the temperature of the sea rose to 54°, and remained at this temperature from the 12th to the 15th of the month. A much warmer day occurred on the 19th, the mean temperature of that day being 58·5°, and the temperature of the sea rose that day to 55°. After this the temperature of the air and sea declined together till the close of the month, when the temperature of the air was 54°, that of the sea 53·9°.

During November the temperature of the sea fell very slowly, being still 52° at the close of the month, that of the air being 45·2°; and the sea, at the depth of twenty-four feet from the surface, had always the same temperature as at six feet. A circumstance, however, deserving special notice, occurred during that month. On the 18th of November, with a S.E. wind, and an air temperature of 52·5°, the temperature of the sea was 53·4°. Next day, the 19th, a very high wind blew from the South; but this wind, instead of bringing additional warmth, either by itself, or by driving before it heated water from the Gulf Stream, seemed rather to encourage evaporation, so that the temperature of the sea both at six and twenty-four feet below the surface fell to 52·5°. After this three consecutive days occurred (viz. the 24th, 25th, and 26th), during which the mean temperature of the air was so low as 39·3°, attended by a North and N.E. wind, under which the temperature of the sea continued to fall until it reached 51·5°; and notwithstanding the prevalence of strong steady winds from the South and S.W. after this period, and during the whole month of December (the mean air temperature of which was higher than that of November), the sea was not able to recover its lost temperature, so that on the 18th of December, when Captain

Otter's series of observations was brought to a close, the temperature of the sea was only 50·8°; that of the air 46·6°.

Mr. John M'Donald, however, continued this series of observations at Bernera, on the same coast; and at the close of December the temperature of the sea was 49°, that of the air 45°.

During the year 1858, daily observations were made on the temperature of the air and sea on our western shores by Mr. John Whyte, manager of the Easdale Slate Quarries; by Mr. John M'Donald at Bernera, Isle of Lewis; and since the 1st of June, by Lieutenant Thomas, of H.M.C. *Woodlark*, off the coasts of Harris and Lewis.

From Mr. M'Donald's observations, which are in continuance of those of Captain Otter, R.N., it appears that the Atlantic, which washes our shores, attained its lowest temperature for the year—viz., 40° at the surface, and 43° at the depth of twenty-four feet—between the 8th and 12th of March, during which period the air attained its lowest mean temperature on that coast, viz., 30° at Bernera, and 34° at Easdale. The temperature of the sea after this gradually rose; and at Bernera, where a strong tidal current washes round the bay where the observations are taken, two maxima were attained during the summer, viz., during June, and again during August. During the very warm weather which prevailed in June, viz., from the 14th to the 25th, the air attained a mean temperature of 60·8°; while that of the sea rose to 58°. Cold weather followed, and from the 1st to the 14th of July the mean temperature of the air was only 53·6°, and the temperature of the sea fell under its cooling influence to 54·2°. After this the weather got warmer, and the air attained a second mean maximum temperature of 61·2°, between the 7th and 12th of August; and the sea temperature again attained a second maximum, its mean temperature during that period being 58·5°. From that period the temperature of air and of sea fell pretty regularly together; the mean temperature of the air during the latter half of September being 53·8°, that of the sea during the same period 56·3°. During October the mean temperature of the air fell to 45·2°, and that of the sea fell regularly with it, but of course more slowly, to 49°. From the 1st to the 13th November the mean temperature of the air was 44·7°, that of the sea 48°. From the 14th to the 20th November the mean temperature of the air fell to 34·5°; and the sea, cooling in consequence more rapidly than before, showed a mean temperature of 45° during the same period. After this warmer weather occurred, and the mean temperature of the air till the close of the month was 45·6, that of the sea during the same period being exactly the same. Warmer weather then set in, the mean temperature of the air from the 3rd to the 11th of December being 47·2°, and the temperature of the sea rose with it to 46·2°. *The air, therefore, could not have received its heat from the sea, seeing ths sea was colder than the air.* Colder weather followed; from the 13th to the 24th of December the air temperature was 43·4°, and the sea again cooled down to 45·6°. The last week of December was still colder: the mean air

temperature being 39·6°; and the sea temperature, falling of course more slowly, descended to 44·6°. The observations of Lieutenant Thomas indicate a general accordance with those just narrated; but as they were made during a limited period, and not always at the same locality, they are not so strictly comparable with the above or with each other. Being also farther out at sea, the temperature was colder, viz. 49·2° at the close of October, than in the land-locked station of Easdale, where the temperature of the sea at the same period was 53°. Thus, again, showing the *influence of the solid land in heating* the water of the ocean which rests on it, so long as the temperature of the solid land exceeds that of the sea.

From this series of observations we perceive that the temperature of the sea rose and fell with that of the air, and that, even in its *fluctuations* of temperature, it bore a distinct accord with the fluctuations in the temperature of the air. This ascertained fact is quite fatal to the theory of the temperature of our seas being dependent on an influx of warm waters from the Gulf Stream; for, had such taken place, any trifling variations in the temperature of the air would have failed to affect that of the sea. But when, in addition to this, we find that, notwithstanding the quite unusual circumstance of S.W. winds having blown continuously for the whole month of December, 1857, the sea did not increase in temperature (as it would have done had warm waters from the Gulf Stream come up along with these winds), but slowly cooled, the conclusion seems almost irresistible that the Gulf Stream has no such effect on our seas, or on our climate, as has been supposed.

What, then, it may be asked, is the agent which drives back the winter's colds, and gives us in Scotland a milder winter than is enjoyed by any country lying in the same latitude?

That the sun is not the agent which of itself gives this milder climate *during winter* to Scotland, is manifest from the fact, that all the regions of the globe, even considerably to the South of our latitude, and which, of course, have much more of the sun's rays and heat during winter, have much more severe winters than we have. But the climate of Scotland exhibits in itself a conclusive proof of the same fact, in the circumstance that March is one of our coldest months,—that month being often in Scotland colder than February itself. This apparently results from the fact that the piercingly cold East winds begin to blow, and are the prevalent winds during that month; and their effect on the temperature is such, that even the increased power and warmth of the sun's rays prove ineffectual in raising the mean temperature. This single fact, then, induces the belief that the mild winters in Britain are chiefly, if not entirely, due to the warm S.W. and West winds, which are the prevalent aerial currents during our winter months.

Indeed, a careful consideration of all the facts has led me to the conclusion that the mildness of the winters in Britain is chiefly due to the S.W. and West winds. So long as these winds blow, we have no frosts or intense colds; but the moment the wind changes during

winter to an easterly, north-easterly, or northerly direction, we have both frosts and snows, and more or less intense colds. Every one must have remarked the fact that all our frosts and snows at once give way so soon as a West, S.W., or South wind blows: in fact, the *mildness* of our winters seems to be exactly proportioned to the prevalence of winds from the South and West, while their *severity* seems to be equally proportioned to the prevalence of winds from the North and East.

That this ought to be the case may be easily demonstrated. During our winter the sun retires far to the South of the equator, and the region of the trade winds does not extend farther North than lat. 15° or 20°. The anti-trade, or south-westerly winds, therefore, blow during our winter season from the whole heated surface of the Atlantic North of 15° or 20°; and as these winds pass over the great mass of heated waters of the Sargasso or Grassy Sea, besides crossing the line of the Gulf Stream and waters of the Atlantic North of it, they attain a temperature much higher than these same winds could attain were they confined to the much cooler waters of the Atlantic North of 40°. In their course to us these S.W. winds meet with no obstructions which could throw them into the upper regions of the air and cool them, but they blow directly to us and to Norway over the level Atlantic; and hence we enjoy a much milder climate *during winter* than any other lands not similarly situated with regard to such winds. If we take a map of Europe, we cannot fail to observe that the only countries which are at all similarly situated with regard to such winds, are Portugal, the South of Spain, Britain, and Norway; and we know that the winter climate of these countries is much milder than that of any countries situated in the same respective latitudes. Before they can reach any other country of Europe, these winds must cross high mountain ranges, which throw them into the upper regions of the air and chill them; so that all the countries of Europe, excepting those above named, have no agent which could drive back the winter's colds. But were these exceptional countries dependent on the Gulf Stream for their mild winters, France, at all events, would equally participate in the benefits which would flow from its heated waters. But the known fact that the winters in France are more severe than those of Britain, shows that it participates to but a small extent in that which is the cause of Britain's and Norway's mildness; and this of itself proves that it cannot be the Gulf Stream which produces that effect. If the cause, however, of the mildness of Britain's winters be the S.W. winds, all is easily explained. These S.W. winds cannot reach France till they have crossed the whole of Spain, and the high mountain range of the Pyrenees; and by the time they have got across that mountainous country, they are so much cooled down that France can derive comparatively little benefit from them, and hence her more severe winters. This theory, therefore, appears satisfactorily to account for the greater severity of the winters in France, as well as the greater mildness of the winters in Britain and Norway; but this conclusion will be brought out more

strongly when we have examined the facts and theories relative to the course of the Gulf Stream.

It is, therefore, proposed now to investigate the facts which have been ascertained relative to the Gulf Stream, to take a view of the currents in the North Atlantic, and point out their bearings on the subject in question.

As Mr. Maury, the Superintendent of the National Observatory at Washington, is not only the most recent writer on the Gulf Stream, but as his work on the *Physical Geography of the Sea* is, as it were, the embodiment of the theory that the climate of our island is dependent on that stream, I shall address myself to an examination of his theory regarding the course of that stream, and his statements regarding it, more especially as his theories appear to have met with nearly universal acceptance in this country.

Mr. Maury's views may be stated to be that the Gulf Stream, leaving the Gulf of Mexico, takes the most direct route it can for the Northern Ocean, so that it brings the British Islands in the very centre of its current. That neither shoals nor counter-currents have any influence on its course, but that it follows this direction in consequence of certain fixed physical laws, which he endeavours to show (most unsatisfactorily, I think) apply to the course of the Gulf Stream. These physical laws are the rotation of the earth on its axis, and the greater lightness given to the waters of the Gulf Stream by increased temperature. For a few of Mr. Maury's statements, on which some comments will afterwards be made, it is best to quote his own words:—

"The Gulf Stream," says he, "has its fountain in the Gulf of Mexico," while "its mouth is in the Arctic Seas. From the Straits of Bemini the course of the Gulf Stream describes (as far as it can be traced, over to the British Islands, which are in the midst of its waters) the arc of a great circle as nearly as may be. Such a course as the Gulf Stream takes is very nearly the course which a cannon ball, could it be shot from these straits to those islands, would describe."—(p. 43.)

Again: "The waters of the Gulf Stream, as they escape from the gulf, are bound for the British Islands to the North Sea and Frozen Ocean. Accordingly, they take, in obedience to this physical law, the most direct route by which nature will permit them to reach their destination. And this course, as already remarked, is nearly that of the great circle, and exactly that of the supposed cannon ball."—(p. 44.)

And yet again: "Many philosophers have expressed the opinion—indeed the opinion is common among mariners—that the coasts of the United States and the shoals of Nantucket turn the Gulf Stream towards the East; but if the view I have been endeavouring to make clear be correct—and I think it is—it appears that the course of the Gulf Stream is fixed and prescribed by exactly the same laws that require the planets to revolve in orbits, the planes of which shall pass through the centre of the sun; and that, were the Nantucket shoals

not in existence, the course of the Gulf Stream, in the main, would be exactly as it is, and where it is. The Gulf Stream is bound to the North Sea and Bay of Biscay, partly for the reason, perhaps, *that the waters there are lighter than those of the Mexican Gulf;* and if the shoals of Nantucket were not in existence, it could not pursue a more direct route."—(p. 45.)

To give a distinct idea of his theory how the currents are produced, he gives the following illustration, which, it will be seen, is exactly the opposite of what the above quotation would require it to be.

"Let us now suppose that all the waters within the tropics to the depth of one hundred fathoms suddenly became oil, the aqueous equilibrium of the planet would be disturbed, and a general system of currents and counter-currents would be immediately commenced,—the oil, in an unbroken sheet on the surface, running towards the poles, and the water, in an under-current, towards the equator. The oil is supposed, as it reaches the polar basin, to be reconverted into water, and the water to become oil, as it crosses Cancer and Capricorn, rising to the surface in the intertropical regions, and returning as before. Thus without wind we should have a perpetual and uniform system of tropical and polar currents. In consequence of diurnal rotation of the planet on its axis, each particle of oil, were resistance small, would approach the poles on a spiral turning to the East, with a relative velocity greater and greater, until finally it would reach the pole, and whirl about it at the rate of nearly a thousand miles the hour. Becoming water and losing its velocity, it would approach the tropics by a similar but inverted spiral turning towards the West. Owing to the principle here alluded to, all the currents from the equator to the poles have an eastward tendency, and all from the poles towards the equator a westward." * * *

"Now, do not the cold waters of the North and the warm waters of the gulf, made specifically *lighter* by tropical heat, and which we see actually preserving such a system of counter-currents, hold, at least in some degree, the relation of the supposed water and oil?"—(p. 33–34.)

Accordingly, of the northerly or Arctic current, which meets the Gulf Stream on the Banks of Newfoundland, Mr. Maury says—"We find the current from the North which meets the Gulf Stream on the Grand Banks taking a *South-westerly* direction. It runs down to the tropics by the side of the Gulf Stream, and stretches as far to the West as our shores will allow. Yet, in the face of these facts, and in spite of this force, both Major Rennell and M. Arago make the coasts of the United States and the shoals of Nantucket to turn the Gulf Stream toward the East."—(p. 45.)

(To be continued.)

Historical Sketch of Eruptions of the Volcano of Mauna Loa, Hawaii.

The late volcanic eruption on Hawaii, which has been visited and viewed with pleasure by a large number of our residents, ladies as well as gentlemen, has excited so much interest in it, that we have prepared the following somewhat extended historical sketch of eruption on that island, which will, we trust, prove interesting at home as well as abroad.

Whether we view its height and immense size, the beauty and singularity of its dome-like summit, or the magnitude and length of its lava streams, the volcano of Mauna Loa, on Hawaii, is one of the most remarkable in the world, rising from the sea to an elevation of nearly 14,000 feet. In height it is only exceeded by the active volcanoes of Cotopaxi, in Ecuador, (18,887 feet,) that of Popocatepetl, in Mexico, (17,700,) and two others in Asia and America. All these, however, rise from elevated table lands, and consequently only show a height of 7,000 to 9,000 feet from their bases. Mauna Loa, on the contrary, rises in one stupendous mount directly from the sea, and as seen by vessels passing it, forms one of the most beautiful sights in the world.

Few of our readers are aware that on the summit of Mauna Loa exists an enormous crater, excelled in dimensions only by that of Haleakala, on East Maui. This crater was first described by the lamented English traveller, Douglas, who visited it in 1834, and subsequently lost his life on the same mountain. The circumference of the rim of this crater, as measured by Lieut. Wilkes, is 11,000 feet long and 8,000 feet wide, being about six miles in circumference. Its depth is 800 feet. The bottom of this crater is rent by terrible chasms, which to all attempts yet made are unfathomable. It is divided into three lesser ones, the northern of which, known as Mokuaweoweo, has frequently been in action; the others appear to have long been quiescent.

Earthquakes, though of frequent occurrence on Hawaii, are happily so light as to be barely perceptible, and have never been known to do more serious damage than that of throwing down stone walls, upsetting milk-pans, &c. The inhabitants of that island seldom manifest the slightest fear from earthquakes. They occur, on an average, six or eight times a year, though in some years nearly double that number have been noticed. On the other islands of this group, excepting occasionally on Maui, earthquakes are never experienced.

Of the three large volcanoes on Hawaii, which were probably in frequent action during the eighteenth century, two of them, Mauna Kea and Hualala, are now extinct. Appearances would indicate that Mauna Kea ceased action first, as the lava on its sides bears an older character. Of Hualala, which was last in action about sixty years since, Jarves says:—

"This mountain was ascended for the first time by a party from Vancouver's vessels in 1794. Smoke was then visible at its greatest elevation. A few years later [in 1801] it poured out a volume of liquefied rock, which overran a wide extent of country, destroying several villages, fish-ponds, and plantations, finally expending itself in the ocean, where it filled up an extensive bay, twenty miles in length, and formed a new headland several miles beyond the old termination of the coast. The mountain yet looks gloomily, as if brooding some new disaster."

The natives on Hawaii still narrate to travellers the story of the death of a woman and child, which occurred probably in the last eruption on Hualalai,—that of 1801. The base of that mountain had then, as it has now, small fishing villages scattered along its shore. The eruption began in the night, and the natives were suddenly roused from their slumbers by the noise of the lava stream flowing down towards their settlement. Nearly all succeeded in escaping. In one hut, however, the husband only was awaked, and going out to learn the cause of the noise, from fright run away, leaving his wife and child. The lava approached rapidly, and before the woman was roused by the wild shrieks of the natives, it had encircled the hut and found its way to the sea. Escape was impossible. To attempt to cross the fiery stream was instant death. Nearer and nearer the stream came until it reached the hut, setting it on fire. The frightened woman, with her child in her arms, sought refuge in a pandanus tree; but here safety was only for a moment. The hut was fast crumbling to ashes beneath the fiery destroyer, which was rapidly approaching the roots of the tree. There was now no hope, the lava had reached the tree and burnt its roots, and soon the woman and child fell a sacrifice to the insatiate goddess Pele.

Mauna Loa is the only active volcano on the Hawaiian Islands. Its principal crater is that of Kilauea on the eastern slope, at an elevation of 4,104 feet above the sea, an account of which is given in the following pages. Its eruptions are not confined, however, to this crater, but occur on all sides of the mountain and at various heights,—sometimes on the summit, but more frequently between 9,000 and 12,000 feet above the sea. We do not know of any publication that gives a full chronological account of the eruptions on Mauna Loa. It would be an interesting study for some of our antiquarians to look up and give brief accounts of the eruptions which have occurred since the discovery of this group. We will commence our account with the eruption of 1801, which is the first to which tradition alludes, or of which there are any particulars.

The Eruption of 1801 *on Mount Hualalai.*

The event is said to have been witnessed by the traveller Turnbull, but we are unable to find his account of it. Ellis, in his Tour around Hawaii, gives the following description of it:—

"In the afternoon, Messrs. Thurston and Bishop walked out in a N.W. direction till they reached the point that forms the northern boundary of the bay, on the eastern side of which Kairua is situated. It runs three or four miles into the sea; is composed entirely of lava; and was formed by an eruption from one of the large craters on the top of Mauna Hualalai, (Mount Hualalai,) which, about twenty-three years ago, inundated several villages, destroyed a number of plantations and extensive fish-ponds, filled up a deep bay twenty miles in length, and formed the present coast. An Englishman, who has resided thirty-eight years in the islands, and who witnessed the above eruption, has frequently told us he was astonished at the irresistible impetuosity of the torrent. Stone walls, trees, and houses, all gave way before it; even large masses or rocks of hard ancient lava, when surrounded by the fiery stream, soon split into small fragments, and falling into the burning mass, appeared to melt again, as borne by it down the mountain's side. Numerous offerings were presented, and many hogs thrown alive into the stream, to appease the anger of the gods, by whom they supposed it was directed, and to stay its devastating course. All seemed unavailing, until one day the King Kamehameha went, attended by a large retinue of chiefs and priests, and, as the most valuable offerings he could make, cut off part of his own hair, which was always considered sacred, and threw it into the torrent. A day or two after the lava ceased to flow. The gods, it was thought, were satisfied; and the king acquired no small degree of influence over the minds of the people, who, from this circumstance, attributed their escape from threatened destruction to his supposed interest with the deities of the volcanoes."

Other Old Eruptions.

Professor Dana, in his Geology of the U.S. Exploring Expedition, the most valuable work to which we have had access, speaks of several early eruptions of the volcano on Hawaii. We quote his account:—

I. 1789.—"The first eruption of Kilauea, of which tradition gives any definite knowledge, occurred about the year 1789, during the wars and conquests of Kamehameha I. It took place between Kilauea and the sea, in a South-easterly direction. It is said to have been accompanied by violent earthquakes and rendings of the earth, and an eruption of stones and cinders from the open fissures. It was so violent and extensive that the heavens were completely darkened, and one hundred lives are supposed to have been lost. There are now, over a large area near Kilauea, a few miles distant to the South or S.E., great quantities of a light pumice-like scoria with stones and sand, which are believed to have been thrown out at this time." [This eruption is spoken of in Dibble's History, as having destroyed part of the army of Keoua, Kamehameha's rival.]

II. 1823.—"The outbreak of 1823, and the features of the crater after it, are described by Mr. Ellis. A large tract of country in Kau was flooded, and the stream, when it reached the sea, as I am informed

by Mr. Coan, was five to eight miles wide. The earth is said to have been rent in several places, and the lavas were ejected through the fissures, commencing their course above ground some miles South of Kilauea. There was no visible communication with the lavas of the crater at the time, but the fact of their subsiding some hundred feet simultaneously with the eruption, is satisfactory evidence of a connection." [This overflow probably entered the sea at Kapapala. It is spoken of by Douglas, in the *Hawaiian Spectator*, vol. ii. p. 415.]

III. 1832.—"In June, 1832, an eruption took place both from Kilauea and the summit crater of Mauna Loa. The only ejection at this time of the lavas of Kilauea to the surface of which we have definite account, occurred in the East wall, from which streams flowed out, part back into Kilauea down the steep slope, and part across into the old crater, which at the time was overgrown with wood. * *

"In September of 1832, when Rev. J. Goodrich visited Kilauea, the eruption had taken place. The lavas, which previously had increased so as to fill up to the black ledge and fifty feet above, had sunk down again nearly to the same depth, leaving, as usual, a boiling cauldron at the South end. The earthquake of the January [June?] preceding had rent in twain the walls of the crater, on the East side, from top to bottom, producing seams from a few inches to several yards in width, from which the region between the two craters (Kilauea and the "Old Crater") was deluged with lava. About half way up the precipice there was a vent a quarter of a mile in length, from which immense masses of lava boiled out directly under the hut occupied by Lord Byron's party."—See *American Journal of Science*, xxv. 199.

"From these accounts (Goodrich's, &c.,) it is probable that, in addition to the ejections from the East wall, which are insufficient to account for the subsidence in the lower pit, there must have been a subterranean outlet beneath the sea."

IV. 1832.—"An eruption is stated to have taken place in the summit crater of Mauna Loa on the 20th of June, 1832, and the mountain continued burning for two or three weeks. The lavas broke out in different places, and were discharged from so many vents that the fires were seen on every side of the dome, and were visible as far as Lahaina." See *American Journal of Science and Arts*, xxv. 201, in a communication from Rev. Goodrich, dated November 17th, 1832.

The Eruption of 1840.

The best account that we can find of this eruption of Kilauea is given by Jarves in his Scenes and Scenery:—

"On the 30th of May, (1840,) the inhabitants of the district detected a smoke and some fire rising in the direction of the volcano, (Kilauea.) As it proceeded from an uninhabited and desolate region, they gave themselves no further concern about it, attributing it to the burning of brushwood. The next day, being Sunday, the several congregations at Hilo and its vicinity were alarmed by the prodigious increase of the flames in that quarter. They increased so rapidly as to leave no doubt that the volcano was in motion; but in what manner

it was discharging itself, was as yet conjecture. The fiery column, sending forth heavy masses of smoke and cinders, gave indication that it was no ordinary outbreak. Fear began to seize upon some. The burning torrent was four thousand feet above them; and if it turned in the direction of Hilo, the devastation would be dreadful. But on the 1st of June it began to move in a North-easterly direction; and in little short of four days reached the sea, having flowed forty miles from its source. Owing to the inequalities of the country, the rapidity of its movement was not uniform. In some places it was stayed for a considerable time, until a valley had been filled up or precipice overthrown. In such spots it spread itself into lakes many miles wide. On level ground it moved slowly and sluggishly, but when it met with a descent, it acquired a velocity of even five miles the hour, consuming everything before it. Its depth varied according to the nature of the soil, and is from twelve to two hundred feet and upwards. The average descent of the country in the direction it took, is about one hundred feet to the mile. Its general movement, owing to its great consistency, was in immense semi-circular masses or waves. These would roll on, gradually accumulating, until the mass had become too heavy to hold itself together, while the exterior was partially cooled and solidified; then bursting, the liquefied interior flowing out would join a new stream, and by its momentum cleave that asunder. By these accelerated progressive movements, the wave-like ridges were formed, which are everywhere observable on the older dykes. At times, it forced its way under the soil, presenting the singular appearance of earth, rocks, and trees in motion, like the swell of the ocean. It found its way into crevices and subterranean galleries, flowing on until it had filled them up, or met with some impediment, then bursting up the superincumbent soil, it bore off upon its livid surface, like rafts on a river, hillocks with trees still standing on them; and so great was its viscidity, heavy rocks floated down with the stream. A white man, who was standing on a small lime hill, near the main stream, absorbed by the spectacle, felt the ground beneath him in motion, and, before he could retire, it had been raised ten to fifteen feet above its former height. He had barely left the spot before it burst open like a shell, and a torrent of fire issued rapidly forth. On the third day of the eruption, three new hills of a mile in length, and from six hundred to eight hundred feet high, were formed in the direction where the fire first appeared. In two days they had entirely disappeared.

"To the windward, the running lava could be approached near enough for those who visited it to thrust long poles into the liquefied rock and draw forth specimens. On the leeward side, owing to the intensity of the heat, the noxious and deadly vapours and gases, with which the air was impregnated, and the showers of hot ashes, sand, and cinders which were constantly descending, all vegetation for many miles was destroyed, and the inhabitants obliged to flee with the greatest expedition. Fortunately, the stream flowed through two 'lands' only, according to the Hawaiian division of territory, those of Nanawale and Kanahikio; both sparsely populated and quite bar-

ren. Consequently, the warning being ample, although a number of small hamlets were overwhelmed, and a multitude of swine and poultry perished, no lives were lost among the people. The body of an old woman, who had just died, was consumed. The colour of the viscid mass was, while flowing sluggishly, of the deepest crimson: when more active, it resembled gore and fresh blood violently stirred together. At Hilo, and places forty miles distant, such was the brilliancy of the light that the finest print could be easily read at midnight. This noontide brightness, converting night into day, prevailed over all East Hawaii for two weeks, and is represented by eye-witnesses to have been a spectacle of unsurpassed sublimity. It was like the glare of a blazing firmament, and was seen for upwards of a hundred miles at sea. It also rose and spread itself above the lofty mountain peaks, so as to be distinctly visible on the leeward side of the island, where the wind drove the smoke in dense and massy clouds."

The Eruption of 1843.

An eruption took place in January, 1843, which is described by Messrs. Andrews and Coan, *Missionary Herald*, xxxix. 381, 463, and xl. 44. It broke out at the very summit on the 10th of January, and continued down the slopes of Mauna Loa in two streams; one flowed to the westward towards Kona, the other flowed northward to the foot of Mauna Kea, and then dividing, one part continued on towards Waimea, North-eastward, and the other towards Hilo, eastward. The branch towards Mauna Kea is described as twenty-five or thirty miles long, and averaging one and a half miles in width. It appears from the accounts that the mountain was fissured in the two directions, and that the ejections took place from the fissures instead of from the summit craters where it commenced. Says Mr. Coan,—"On the morning of January 10th, before day, we discovered a small beacon fire near the top of Mauna Loa. This was soon found to be a new eruption on the North-East slope of the mountain, at an elevation of near thirteen thousand feet."

"Subsequently" Mr. Coan goes on to say, "the lava appeared to burst out at several different points lower down the mountain, from whence it flowed off in the direction of Mauna Kea, filling the valley between the mountains with a sea of fire. Here the stream divided, part flowing toward Waimea, and the other eastward toward Hilo. Still another stream flowed along the base of Mauna Loa to Hualalai, in Kona. For about four weeks this scene continued without much abatement," &c. Ascending the mountain, Mr. Coan reached the stream of lava between Mauna Loa and Mauna Kea, about 7,000 feet above the sea. On the evening of the third day, "as darkness gathered around us, the lurid fires of the volcano began to glow and to gleam upon us from the foot of Mauna Kea, over all the plain between the two mountains, and up the side of Mauna Loa and its snow-crowned summit, exhibiting the appearance of vast and innumerable furnaces burning with intense vehemence. On this plain we spent the day in traversing and surveying the immense streams of fresh

scoria and slag which lay in wild confusion further than the eye could reach, some cooled, some half cooled, and some still in fusion," On the ascent they passed fields of scoria, and regions that were at times steaming and hot, evincing igneous action beneath.

"Soon we came to an opening of twenty yards long and ten wide, through which we looked, and at the depth of fifty feet we saw a vast tunnel or subterranean canal, lined with smooth vitrified matter, forming the channel of a river of fire, which swept down the steep side of the mountain with amazing velocity. As we passed up the mountain we found several similar openings into this canal, into which we cast large stones; these, instead of sinking into the viscid mass, were borne instantly out of sight. Mounds, ridges, and cones were thrown up along the line of the stream, from the latter of which stream gases and hot stones were ejected. At three o'clock we reached the verge of the great crater where the eruption first took place, near the highest point of the mountain. Here we found two immense craters, close to each other, of vast depth, and in terrific action."

The Eruption of 1852.

This eruption occurred in February, 1852, and broke out on the North side of Mauna Loa, not a great distance from that of 1855. An account of it, written by Mr. J. Fuller, and dated May 12th, we find in the *Friend* for May, 1852, and extract a few paragraphs describing the scene:—

"During the first night, at the distance of forty miles, we heard the rumbling of the volcano, like the roar of the heavy surf breaking on the shore, and saw the sky brilliantly illuminated above the crater and the flowing lava. An immense column of vapour and smoke arose from the crater and formed a magnificent arc, reflecting the red and purple light of the fiery masses below. Animated by sights and sounds so grand, we quickened our pace in order to gain a nearer view of the scene, believing that in this case distance did not lend enchantment to the view.

"On the second day towards night we came to a hut built by the party of the previous week; being wet with the rain, we concluded to spend the night here; we enlarged the house, built a fire in one part of it, put on dry clothes, wrapped ourselves in our blankets, and passed a comfortable night. The morning was fine, we soon caught sight of the lava, jets as they shot up above the distant mountain ridges, and passing the whitened bones of a mule lost by the King's party while crossing the mountains two or three years ago, snatching here and there a bunch of delicious ohelos which grew by the path, we came, at about 10h. a.m. of the third day to the last ridge that separated us from the region of the eruption; ascended to the top of this, the whole scene, wild, terrific, grand, magnificent, burst on our senses!

"It is impossible to give you a complete description of what we saw and heard or to draw a picture which will produce the same impression on your mind that the original did on mine. Language, on such

an occasion, is powerless; eloquence is dumb and silence is the expression most congenial to the sentiments of the soul. Yet I will try to give you some facts and hints which will assist your imagination in its conceptions of the wildly interesting scenes we witnessed.

"Imagine yourself, then, just ascended to the top of the above-mentioned eminence. Before you, at a distance of two miles, rises the new formed crater in the midst of fields of black smoking lava, while from its centre there jets a column of red hot lava to an immense height, threatening instant annihilation to any presumptuous mortal who should come within the reach of its scathing influence. The crater may be 1,000 feet in diameter and from 100 to 150 feet high. The column of liquid lava which is constantly sustained in the air, from 200 to 500 feet high, and perhaps the highest jets may reach as high as 700 feet! There is a constant and rapid succession of jets one within another, the masses falling outside and cooling as they fall, form a sort of dark veil, through which the new jets darting up with every degree of force and every variety of form, render this grand *fire fountain* one of the most magnificent objects that human imagination can conceive. From the top of the lava jets the current of heated air carries up a large mass of scoria and pumice, which falls again in constant showers for some miles around the crater."

The Eruption of 1855.

This was fully described in our journal of the issue of July 24th, 1856, which we copy here:—

"On the evening of the 11th of August, 1855, about ten o'clock, a small light, apparently of burning brushwood or grass, was seen near the top of Mauna Loa, which rapidly increased until the whole heaven reflected its brightness, and turned the night into day. So bright was it towards morning that fine newspaper print could easily be read by the light. It was certain that some unusual eruption had begun. This light continued, varying in brightness, for weeks; sometimes a dense smoky atmosphere obscured it wholly, but when clear, the sight as seen by vessels at sea is represented to have been grand beyond description. The seat of this eruption, which is in the old traditional crater of Mokuaweoweo, is on the summit of Mauna Loa, some 14,000 feet above the level of the sea, in a region rarely visited by man.

We cannot give a better description of the beauty and novelty of this grand sight than by quoting Mr. Coan's account of his trip to the crater in October, 1855:—

"Taking the channel of a stream which enters Hilo Bay as our path, we advanced with much toil through the dense jungle along its banks, and rested at night at the roots of an ancient tree,—having made about twelve miles. The next day we made about twelve miles more, for the most part in the rocky bed of the stream, the water being low. Volcanic smoke filled the forest, and charred leaves came floating on the breeze and falling into the wild channel we were threading. At night, when the shades gathered over these deep soli-

tudes, unbroken save by the bellowing of the mountain bull, the barking of the wild dog, the grunt of the forest boar, the wing and the note of the restless bird, the chirping of the insect, the falling of a time-worn tree, the gurgling of the rill, and the wild roar of the cataract, we made our little bed of ferns under the trunk of a prostrate tree, and here, for the first time, we found that the molten stream had passed us in the jungle on the left, and was now many miles below us on its way to Hilo. But we would not retreat, and as the jungle was nearly impenetrable in the direction of the stream, we pursued our upward way in the bed of the river until 1.30 p.m. on the third day, when we found ourselves out of the forest, and on the high plateau at the base of the mountain. I cannot stop to describe the beautiful, the romantic, the wild, the wonderful, in the banks, the narrows, the widenings, the rocks, the rapids, the cascades, the basins, the caves, and natural bridges of this solitary stream. Nor can I speak of the velvet mosses, the modest creepers, the rich festoons, the sweet wild flowers, the gigantic ferns, the ancient forests, and all the tropical glories which are mirrored in its limpid waters. We needed an artist and a naturalist to fix the glowing panorama, to paint the flora and catch the fauna of these romantic solitudes.

"When we emerged from the upper skirts of the woods, a dense fog obstructed our view of all distant objects, so that we could not see the summit-fires nor trace the molten stream down the slope of the mountain. We encamped early in a vast cave; but during the night the stars came out, and the volcanic fires played brilliantly from their high source down the mountain sides, over the scorified plains, and far down in the forest over Hilo.

"Early in the morning (Friday the 5th) we left our cavern, and at 7.30 a.m. were on that black and smouldering stream, for which we had been searching for more than three days. Almost as far as the eye could reach, these regions had been flooded with seas of fusion,—now, for the most part, hardened, but smoking and crackling with heat and escaping gases.

"We passed several miles up the left verge of the stream, and finding a narrow well solidified place, we crossed over to the right verge, our passage occupying an hour and a quarter. We now ascended rapidly along the right bank of the stream, sometimes upon it and again skirting it, according to the facility for travelling or the directness of its course. The stream is very tortuous, making ample detours and sudden zigzags, so that we saved much by cutting off bends or following the bases of the triangles described in its course.

"All this day we came to no open fire. The first overflowing had stiffened and solidified in contact with the atmosphere, forming a broad open pall.

"Under this self-made counterpane the continuous stream has formed a vast duct; and in this subterranean pyroduct it now flows like oil, at the depth of from twenty to one hundred feet, unexposed to the stiffening action of the air.

"At night we slept on the higher regions of the mountains, beyond

the line of vegetation, with the slag for our pillow, the heavens for our canopy, the stars for our watch-fires, and Israel's Shepherd for our guardian.

"We were astir early on Saturday morning, climbing over indescribable hills, cones, ridges, and masses of hot and smoking debris and scoria, scattered wild and wide over those Plutonic regions. We soon came to a line of jagged cones with open orifices of from twenty to one hundreed feet in diameter, standing over the molten river and furnishing vents for its steam and gases.

"We approached the vents with awe, and, looking down their fiery throats, we heard the infernal surgings and saw the mad rushings of the great molten stream, fused to a white heat. The angle of descent was from 3° to 25°, and we judged the velocity to be forty miles an hour.

"The maddening stream seemed to be hurrying on, as if on swift commission from the Eternal to execute a work of wrath and desolation in the realms below. Upward and onward we went, climbing ridge after ridge, parched with thirst, panting in a rare atmosphere, blinded by smoke, almost scathed by heat and excoriated by sulphurous gases.

"All the rest of the way we saw frequent openings into the fiery canal, on whose arched ceiling we walked for miles, with the fearful stream rushing madly beneath our feet. At 1h. p.m. we found ourselves at the terminal crater and standing on its craggy and smoking crest.

"This was the high fountain of eruption,—the great chimney which goes down immeasurable depths into those fearful realms where man's eye never penetrated, and where he cannot look and live. For nearly five days we had struggled to gain this point; and now we were here —specks, atoms in creation—obscured by smoke, startled by infernal hissings, amid these wild wonders, these awful displays of power which had scattered such a tempest of fiery hail and raised such a raging sea of molten rocks on these everlasting hills.

"The grandeur, the sublimity, the terror of the scene were unutterable. A vast chasm had opened horizontally on the top of the mountain, and along this yawning fissure stood a series of elongated, jagged, and burning cones, about one hundred feet high, rent through this larger diameter and throwing up dense columns of blue and white smoke, which, covering the mountain's summit, rolled in fleecy masses down its sides and spread out like the wings of chaos over unmeasured regions. Still no fire could be seen in this fountain crater. We could feel it everywhere, and we could see and hear its escaping gases; but the throats of the cones were clogged with hot masses of cinders, pumice, and ashes, with cracks, crevices, &c., for the escaping smoke. The fusion had long since found vent in a lateral subterranean duct several hundred feet below the rim of the crater, and in this covered way it flows off until it makes its appearance, as described, some two miles down the side of the mountain."

This eruption, which in the quantity of lava thrown out has prob-

ably never been surpassed during the residence of foreigners on these islands, continued for about thirteen months, and stopped when within six or seven miles of Hilo. The stream was more than sixty miles long, and the area covered by the eruption probably exceeded 300 square miles. It finally ceased and became quiet during September or October 1856.

(To be completed in our next.)

A Glance at Early Portuguese Navigation—*as it was nearly Three Centuries ago.*

The Voyage into the East or Portingale Indies.

(Continued from page 229.)

The 15 of Aprill we espied the Island of Madera and Porto Sancto, where the ships use to separate themselves, each ship keeping on his course, that they may get before each other into India for their most commodities and to dispatch the sooner; whereby in the night, and by tides, they leave each others company, each following his own way.

The 24 of Aprill we fell upon the coast of Guinea, which beginneth at nine degrees and stretcheth untill wee come under the Equinoctiall, where we have much thunder, lightning, and many showers of raine, with stormes of wind, which passe swiftly over, and yet fall with such force, that at every shower we are forced to strike sayle, and let the main yeard fall to the middle of the mast, and many times cleane down, sometimes ten or twelve times every day: there wee find a most extreme heate, so that all the water in the ship stinketh, whereby men are forced to stop their noses when they drinke, but when we are past the Equinoctiall it is good againe, and the nearer we are unto the land, the more it stormeth, raineth, thundreth and calmeth; so that most commonly the shippes are at the least two monthes before they can passe the line.

Then they finde a winde which they name the generall winde, and it is a Southeast winde, but it is a side wind, and we must always lie side waies in the wind almost untill wee come to the cape de Bona Speranza, and because that upon the coast of Brasillia about 18 degrees, on the south side lieth great flakes or shallowes, which the Portingales call Abralhos, that reach 70 miles into the sea on the right side, to passe them, the ships hold up most to the coast of Guinea, and so passe the said flattes, otherwise if they fall too low and keepe inwardes, they are constrained to turne againe unto Portingale, and many times in danger to be lost, as it happened to our Admirall Saint Phillip, which in the yeare 1582 fell by night upon the flats, and was in great danger to be lost, yet recovered againe, and sayled backe to Portingale, and now this yeare to shunne the flats shee kept so neare the coast of Guinea, that by meanes of the great calmes and raynes,

she was forced to drive up and down two months together, before shee could passe the line, and came two months after the other ships into India. Therefore men must take heed, and keepe themselves from comming too neare the coast, to shun the calmes and stormes, and also not to hold too farre of thereby to passe the flats and shallowes wherein consisteth the whole Indian voyage.

The 15 of May being about fiftie miles beyond the Equinoctiall line northwardes, we espied a French ship, which put us all in great feare, by reason that most of our men were sicke, as it commonly hapneth in those countries through the exceeding heate: and further they are for the most part such as never have beene at sea before that time, so that they are not able to do much, yet we discharged certaine great shot at him, wherewith he left us (after he had played with us a little time) and presently lost the sight of him, wherewith our men were in better comfort. The same day about evening we descried a great ship, which we judged to bee of our fleet, as after we perceived, for it made towards us, and it was the *Saint Francesco*, wherwith we were glad.

The 26 of May wee passed the Equinoctiall line which runneth through the middle of the Island of St. Thomas, by the coast of Guinea, and then we began to see the South Star, and to lose the North Star, and found the Sunne at twelve of the clocke at noone to be in the North, and after that we had a South east wind, called a general wind, which in those parts bloweth all the year through.

The 29 of May being Whit Sonday, the ships of an ancient custome, doe use to chuse an Emperour among themselves, and to change all the officers in the ship, and to hold a great feast, which continueth three or foure dayes together, which wee observing chose an Emperour, and being at our banket, by meanes of certaine words that passed out of some of their mouthes, there fell a great strife and contention among us, which proceeded so farre, that the tables were throwne downe and lay on the ground, and at the least a hundred rapiers drawne, without respecting the Captaine or any other, for he lay under foote, and they trod upon him, and had killed each other, and thereby had cast the ship away, if the Archbishop had not come out of his chamber among them, willing them to cease, wherwith they stayed their hands, who presently commanded every man on paine of death, that all their Rapiers, Poynyardes, and other weapons should bee brought into his chamber, which was done, whereby all thinges were pacified, the first and principal beginners being punished aud lay in irons, by which means they were quiet.

The 12 of June we passed beyond the aforesaid flats and shallowes of Brasillia, whereof all our men were exceeding glad, for thereby we were assured that we should not for that time put back to Portingale againe, as many doe, and then the generall wind served us, untill we came to the river of Rio de Plata, where we got before the wind, to the cape de Bona Speranza.

The 20 of the same month, the *S. Franciscus* that so long had kept us company was again out of sight: and the eleaventh of July after, our Master judged us to be about 50 miles from the cape de

Bona Speranza: wherefore he was desired by the Archbishop to keep in with the land, that we might see the cape. It was then mistie weather so that as we had made with the land about one hour more, wee perceived land right before us and were within two miles thereof, which by reason of the dark and misty weather we could no sooner perceive, which put us in great feare for our judgement was clean contrarie.

But the weather beginning to cleare up, we knew the land, for it was a part or bank of the point called Cabo Falso, which is about fifteen miles on this side the Cape de Bona Speranza, towards Mossambique the Cape de Bona Speranza lieth under 34 degrees Southward, there we had a calme and faire weather, which continuing about halfe a day, in the meane time with our lines we got a great store of fishes upon the same land at ten or twelve fadoms water, it is an excellent fish much like to haddocks, the Portingales call them Pescados.

The twenty of the same month wee met againe with *Saint Francisco*, and spake with her, and so kept company together till the 24 of June, when we lost her againe. The same day we stroke all our sayles, because we had a contrarie wind, and lay two days still driving up and downe, not to loose any way, meane time we were against the high land of Tarradonatal, which beginneth in 32 degrees, and endeth in 30, and is distant from Capo de Bona Speranza 150 miles.

In this place they commonly use to tak a counsell of all the officers of the ship, whether for to sayle through within the land of S. Laurenso, or without it, for that within the land they sayle to Mossambique, and from thence to Goa, and sailing without it they cannot come at Goa by reason they fal down by meanes of the streame and so must sail unto Cochin which lieth 100 miles lower than Goa, and as the ships leave the Cape, then it is not good to make towards Mossambique, because they cannot come in time Goa by reason of the great calmes that are within the land.

But they that pass the Cape in the month of July, may well go to Mossambique, because they have time inough there to refresh themselves, and to take in fresh water and other victuals, and so to lie at anker ten or twelve days together, but such as passe the cape in the month of August, doe come too late, and must sayle about towardes Cochin, thereby to lose no time, yet it is dangerous and much more cambersome for that commonly they are sicke of swolen legs, sore bellies, and other diseases.

The 30 of July, wee were against the point of the cape called Das Corentes, which are 130 miles distant from Terra Do natal, and lieth under 24 degrees Southwarde, there they begin to passe between the Islands.

From S. Laurenso to Mossambique, which lieth from the firm land of Das Correntes 120 miles, and is an island 220 miles long, stretching North and South and in breadth 70 miles, beginning from the first point, untill you come at the Cape in 26 degrees and endeth in the North in 11 degrees. The people of the Iland are blacke, like those

of Mossambique, and goe naked, but the haire of their heades is not so much curled as theirs of Mossambique, and not full so blacke. The Portingales have no speciall traffique there because there is not much to be had, for as yet it is not very well known.

The 1 of August we passed the flats called os Baixos de Judea, that is the flats of the Jewes, which are distant from the cape das Corentes, 30 miles, and lie between the Iland of S. Laurence and the firme land seaventy miles, which flats begin under 22 degrees and a halfe, and continue to twentie one degrees: there is great care to be taken lest men fall upon them, for they are very dangerous, and many ships have bin lost there, and of late in Anno 1585 a ship comming from Portingale called *S. Jago* beeing Admirall of the fleet, and was the same that the first voiage went with us from Lisbone, for vice Admirall, as in another place we shall declare.

The fourth of August we descried the land of Mossambique, which is distant from the flattes of the Jewes nineteen miles under fifteene degrees southwardes. The next day we entered into the road of Mossambique and as we entered we espied the foresaid ship called *S. Jago* which entered with us, and it was not above one houre after we had descried it, being the first time we had seene it since it left us at the Iland of Madera, where we separated ourselves.

There we found likewise two more of our shippes *Saint Lourenzo* and *Saint Francisco*, which the day before were come thether with a small ship that was to sayle to Malacca, which commonly setteth out of Portingale a month before any of the ships do set sayle for India, only because they have a longer voyage to make, yet doe they ordinarily sayle to Mossambique to take in sweete water and fresh victuals, as their voiage falleth out or their victuals scanteth.

Being at Mossambique wee were foure of our fleete in company together, only wanting the *S. Phillip*, which had holden her course so nere the coast of Guinea, (the better to shun the flats of Brazillia that are called Abrollios, whereon the yere before we had once fallen) that she was so much becalmed that she could not passe the Equinoctiall line in long time after us, neyther yet the Cape de Bona Speranza without great storms and foul weather as it ordinarilie happeneth to such as come late thether, whereby shee was compelled to compasse about and came to Cochin about two months after we al arrived at Goa, having passed and endured much misery and foule weather, with sicknesse and diseases, as swellings of the legs, and the scorbuicke, and paine in their bellies, &c.

The 4 Chapter.

The description of Mossambique which lieth under 15 degrees on the South side of the Equinoctiall line uppon the coast of Mulinde, otherwise called Abex or Abexim.

Mossambique is a Towne in the Iland of Prasio with a safe, (although a small) haven on the right side: towardes the cape they have

the golden mines called Sofala, on the left side the rich towne of Quiloa: and by reason of the foggie mistes incident to the same the place is both barren and unwholsome, yet the people are rich by reason of the situation. In time past it was inhabited by people that beleeved in Mahomet, being overcome and kept in subiect.on by the tirant of Quiloa, and his lieftenant (which the Arabiens called Zequen) that governed them.

Mossambique is a little Iland, distant about halfe a mile from the firme land, in a corner of the said firme land, for that y^e^ firme land on the north side stretcheth further into y^e^ sea than it doth, and before it there lie two smal Ilands named S. George and S. Jacob, which are even with the corner of the firme land, and betweene those two Ilands not inhabited and the firme land the ships doe sayle to Mossambique leaving the Ilands southward, on the left hand, and the firme lande on the North, and so without a Pilot compasse about a mile into the sea to Mossambique, for it is deepe enough, and men may easily shun the sands that lie upon the firme land because they are openly seene.

The ships harbour so neare to the Iland and fortresse of Mossambique, that they may throw a stone out of their ship uppon the land, and sometimes further, and lie betweene the Iland and the firme land. which are distant half a mile from each other, so that the ships lie there as safely as in a river or haven. The island of Mossambique is about halfe a mile in compasse, flat land and bordered about with a white sand. Therein growe many Indian palmes or nut trees, and some orange, apple, Lemmon, Citron, and Indian figge trees: but other kindes of fruit which are common in India are there verie scarce. Corne and other graine with Rice and such necessarie marchandizes are brought thether out of India, but for beasts and foule, as oxen, sheep, goats, swine, hennes, &c., there are a great aboundance and very good and cheape.

In the same Iland are found sheep of five quarters in quantitie, for that their tayles are so broad and thicke, that there is as much flesh upon them, as upon a quarter of their body, and they are so fatte that men can hardlie brooke them. There are certaine hennes that are so blacke both of feathers, flesh, and bones, that being sodden they seeme as black as inke, yet of very sweet taste, and are accounted better then the other: whereof some are likewise found in India but not so many as in Mossambique. Porke is there a very costly dish, and excellent faire and sweete flesh, and as by experience it is found it farre surpasseth all other flesh: so that the sicke are forbidden to any kinde of flesh but only Porke, because of the excellency thereof.

This Iland being first discovered by the Portingales, was the onely meanes that they found the Indies; for that from thence they used to take Pilots, which taught them the way:

They have no sweet water in this Iland to drinke, but they fetch it from the firm land, out of a place called by the Portingales Cabaser, and they use in their houses great pots which come out of India to keepe their water in.

The Portingales have therein a verie faire and strong castle which now about 10 or 12 yeares past was fullie finished, and standeth right against the first of the unhabited little Ilands, where the ships must come in. and is one of the best and strongest built of all the Castles throughout the whole Indies, yet have they but small store of ordnance or munition, as also not any souldiers more then the Captaine and his men that dwel therein. But when occasion serveth, the married Portingales that dwel in the Iland, which are about 40 or 50 at the most, are all bound to keepe the Castle, for that the Iland hath no other defence then onely that Castle, the rest lieth open and is a flat sand.

Round about within the castle are certaine cesterns made which are alwaies ful of water, so that they have water continuallie in the same for the space of one whole yeare or more, as necessitie requireth, although they take no great care for their necessitie, neither Captaine, officers, nor other inhabitants of the Iland, for that they doe it orderly one by one, each house after the other specially those 40 or 50 Portingales and Mesticos, which are Portingales offspring, but borne in India, which are called Mesticos, that is as much to say, as halfe their countrie men, which are also esteemed and accounted for Portingales.

There are at this time in the Iland of Mossambique about 3 or 400 straw houses and cottages, which belong to the natural born people of the countrie. being all blacke like those of Capo Verde, Saint Thomas and all Ethiopia, and under the subiection of the Portingales, some of them believing in Mahomet: for before the Portingales held that Iland by traffique and dailie conference with the Moores and Mahometanes as far as the red Sea they held the law of Mahomet, as there are yet many that hold the same law, even unto the red Sea, but from Mossambique upwardes to Cape de Bona Speranza, they never received that law: so that there the Moors and natural borne people of the countrie, doe as yet live like beastes, without knowledge cyther of God or of his lawes: Some of the Moores of the Iland are likewise Christians, and some heathens.

The Portingales deale and traffique with such as dwell on the firme land in some villages nearest unto them, as Sena, Macuwa, Sofala, Cuama, &c., which for the most part differ both in behaviour, speech, and manner of life, each village by itself, and fight one against the other, taking each other prisoners and sell them, some of them eating mans flesh, as the Macuwen and others. Their chiefest living is by hunting, and by flesh of elephants, which is the cause that so many elephantes teeth are brought from thence.

(To be continued.)

Currents of the Pacific Ocean.

(Continued from page 293.)

Northern Equatorial Current.—About the meridian of 126° W. long., and on the parallel of 29° N., the North Equatorial Current becomes apparent. Its northern limit continues nearly along this parallel to Loo Choo Island in 127° E. But as soon as it reaches West of the Sandwich Islands, it diverges so considerably towards the South, as to be found in this part near the parallel of 19° N.; sometimes it is found still further South.

The temperature of the Northern Equatorial Current is about 74° at its northern limit, 77° on the parallel of 20° N., 82° on that of 10° N.; near the equator in the East part of the Pacific Ocean, it is 82°, at the middle 84°, to the West and North of New Guinea 89°, the maximum temperature of the Pacific.

In this northern division of the Equatorial Current some remarkable anomalies are found. Thus, between the parallels of 10° and 5° N. lat., and particularly between the meridians of 115° and 150° W. long., is found the eastern part of a counter-current, called the Equatorial counter-current, flowing eastward. This current is sometimes further East, according to Johnstone. In the voyage of the *Bonite*, in 1836 and 1837, it appears that from the 21st to the 30th of August, 1836, between the parallels of 4° 55′ and 11° 8′ N., and between the meridians of 100° and 107° W., currents were found varying from N.N.E. to E.N.E. from three to thirty-four miles in twenty-four hours. This current, perhaps, is not always found in this zone. Commander Hanet-Clery, on the 9th of April, 1846, in lat. 10° 21′ N., and long. 150¾° W., found a current running S. 42° W., at a rate of 25·4 miles per day. On the 11th of April, in lat. 6° 7′ N., and 146¼° W. long., the current was running N. 61° W., at a rate of 20 miles per day; and on the 13th of April, in 1° 17′ N., and 146¼° W., the current was setting S. 58° W., 38 miles per day.

Capt. Wilkes shows that the origin of the Equatorial counter-current is found in the Indian Ocean. According to his views, the current which flows along the western coast of Australia, in the Indian Ocean, is a detached branch of this current. After it has turned the western coast of Australia it makes for the Pacific Ocean by the straits formed by New Guinea and Mindanao.

The eastern equatorial current, traces of which are found near Marshall and Gilbert Islands, separates, according to Capt. Wilkes, the northern from the southern equatorial current, and traverses the whole breadth of the Pacific Ocean. The following statements seem to confirm this opinion of Wilkes, and are of importance to ships making a passage from West to East in the Pacific.

Capt. Hunter shows that a ship can make her way to the eastward in the Pacific without going round South of Australia. He says, the whalers generally follow this route while the S.E. monsoon prevails

South of the equator; that is to say, from the end of March or the commencement of April to December or January, they keep North of the South equatorial current and on the limit of the general winds and monsoons. We may refer the navigator to Capt. Hunter's own words on this subject in our May number, p. 250.

These facts amply confirm the existence of a counter-current more or less considerable separating the North equatorial from the South equatorial current. But it has been found over nearly the whole extent of the Pacific by different navigators, as the following extracts will show.

Lutké, in the East part of the Pacific, found currents flowing East, N.E., and S.E., principally in this last direction, between the equator and the parallels of 8° and 10° N. The mean direction of these currents was E. 6° S., and the rate twelve miles per day.

In the West part of the Pacific Ocean, near the Carolines, in spite of the strong winds from N.E., the same captain found a S.E. current in 8° N. and 163° E. To the West of this the easterly current does not extend beyond 7° N., and its southern limit was in 5° 30′ N. Between these two parallels to the meridian of 152° E., during a voyage of twenty-one days, (in January,) he did not meet once with a westerly current; but, on the contrary, often met with an easterly current with a tendency to the southward. North of lat. 6° 30′, on the meridian of 152° E., he found a strong current setting West: to the West of this, in 144° E. and to the southward of 7° N. lat., he again found an easterly current. South of the parallel of 5° N., and on the meridian of the island of Ualan, the current was setting strong to S.W.; but on the parallel of 3° N., it was again found flowing East at a rate of thirteen miles a day.

Other seamen have also mentioned an eastern equatorial current both in the West and the eastern part of the Pacific. Wilson found it in the Caroline Archipelago, extending more to the southward than described by Lutké. Duperry, between the parallels of 2° and 6° N., being from 7° to 10° East of the meridian of the island of Oualan, found a S.E. current, as well as another to the N.E. But in nearing this island he found it setting strongly to S.W. Again, between the equator and the parallel of 8° 30′ N., and the meridians of 148° and 133° E. he found it running East.

Krusenstern places the southern limit of the eastern current near the equator, and its northern limit near the parallel of 6° N. Freycinet met with strong easterly currents between the parallels of 9° 20′ and 4° N., and the meridians of 149° and 144° W. long. Beechey found between the equator and the parallel of 4° N., on his way from Tahiti to Sandwich Islands, a current setting N.N.E. at a mean rate of eighteen miles per day.

Capt. Wendt, of the *Princess Louisa*, between the parallels of 6° 30′ and 10° 30′ N. and the meridians of 125° and 131° W., found a N.E. current flowing from seventeen to twenty-five miles per day. All these currents flowing East are necessarily connected with each

other, and enable us to trace the eastern or counter equatorial current on the chart.

Krusenstern says, in speaking of this current, flowing from West to East, that it extends over the West part of the Pacific Ocean in a zone between the equator and the parallel of 6° N., and that it sometimes attains a rate of sixty miles per day. Ships returning from China in the S.W. monsoon, and entering the Pacific Ocean by the straits of Yamen, generally pass no further East than the Pellew Islands; but if they do not pay great attention to this eastern current they are carried several degrees by it in this direction. They should therefore cross it rapidly from North to South, so as to reach the S.E. Trades as soon as possible, and get into South latitude, where, near New Guinea, a westerly current will be found, sometimes W.N.W., at a rate of fifteen to forty miles per day. This important counter-current should receive the attention of navigators, with a view to add their observations to the foregoing, so that its limits may be traced where they are yet unknown, for it may extend across the entire Pacific, which as yet is not absolutely determined.

Easterly Currents West of the Sandwich Islands.—To the West of the Sandwich Islands, and nearly in their parallel, easterly currents are found, which Johnstone calls "the entanglement of the eastern current."

This fact is clearly shown by the observations of some Prussian navigators. Besides, Freycinet speaks of it, Beechey mentions it, and Lutké has collected numerous observations which prove the existence of these easterly currents in a zone where the Trade winds blow with the greatest force. Savans have endeavoured to find the reason of this anomaly in the North equatorial current. We shall see from observations on temperature that what has been considered as a disturbance of the equatorial current, is in reality only the Japan Current, similar to the Gulf Stream of the Atlantic Ocean. We shall first refer to the currents produced by the monsoons of the Caroline Islands while we are in this part of the Pacific Ocean; but it is worthy of remark that the *Bonite*, in 1836, from the Sandwich Islands to Manila, and running between the parallels of 18° and 19° N. lat. to Luconia, found no easterly current here, from which we conclude that in this part of the Pacific, West of the archipelago of Hawaii, the northern limit of the equatorial current is nearly on the parallel of 19° N., and that it is North of this parallel that easterly currents are found.

Currents of the Caroline Islands in the Monsoons.—In the zone of the North equatorial current, and near the western limit of the Pacific, a remarkable independent current is found, known by the name of the monsoon current of the Carolines.

The monsoons of the China Sea, as already observed, exert their influence as far as the meridian of the Marianne Islands and over that of the Carolines. In this part of the sea the Trade and S.W. monsoon alternately prevail. The result is a corresponding current, which especially in the West part of the Caroline Archipelago attains a very considerable velocity.

These monsoon currents of the Carolines appear to occupy a zone comprised between the meridian of Bonnebey on the East and Gilolo Island on the West, extending from the parallel of 10° or 8° N. to the equator.

From June to October the current runs N.E., varying to E.N.E. From October to May it runs S.W. and W.S.W. The mean rate, however, is not more than two or three miles a day. The temperature of their waters varies from 85° to 89°, which last temperature is found very near the equator, in 135° E., the maximum of the waters of the Pacific Ocean. Notwithstanding these monsoon currents, the equatorial current prevails West of the Marianne Islands, a little South of the South parallel of the Carolines, and does not appear to be influenced by the monsoons.

In this part of the Pacific, its southern limit, which flows W.N.W., passes about 120 miles South of Guam, (one of the Marianne Isles,) and at the same distance North of Ouluthi Island, (one of the Carolines,) from thence the equatorial current, the northern limit of which is near the parallel of 26° N., becomes narrower in proportion as the strait of Formosa is approached. At 120 leagues East of this island it suddenly turns northward, and then N.E., and forms the great Japan Current.

Japan Current.—From the island of Loo-Choo, 140 leagues off the eastern coast of China, a continual warm current flows along the East coast of Japan, in an E.N.E. and N.E. direction, often with considerable velocity. It would appear to be occasioned by the accumulated waters of the equatorial current returning to eastward. Its influence is felt as far as the N.W. coast of America, thus, nearly crossing the whole ocean from West to East, it appears to form the Gulf Stream of the Pacific.

The western part of the northern equatorial current having passed from the eastward South of the Loo-Choo Islands, curving round to the N.E. then becomes the Japan Current, continuing its easterly course to the eastward of the Japanese Islands to the meridian of 180°. From thence it runs E.N.E., crossing the parallel of 30° N., on the meridian of the Sandwich Islands; and again running N.E., crosses the meridian of 150° W. in 40° N.

From thence it takes a S.E. direction, curving to the South and S.W. on the parallel of 32° N. lat., and on the meridian of 133° W., where we fail in tracing it further.

The Japan Current, after flowing along the eastern coasts of these islands, and only as one current, gradually spreads itself, and in the latitude nearly of the middle of Niphon Island, forms into two branches, one flowing North-eastward in the direction of Behring Strait, is called the Kamtschatka Current, to which we shall allude presently; the other continuing East, as abovementioned, preserves its name of the Japan Current; its northern limit appears first to continue to the eastward, and is found in 160° E. and 41° N., and in 165° W. and 44° N. From thence turning to the North-eastward, it becomes lost near the N.W. coast of America.

The rate of the Japan Current varies very much. On the parallel of 36½° N., its direction has been found N.E.b.E., with a mean rate of ten miles a day. From 36° N. to that of 35° N., at seventy leagues from the coast, its direction is E.N.E., and its rate forty-eight miles. At twenty-five leagues from the coast, in the same latitude, its rate is seventy-two miles. King also assures us that in these latitudes he found it running at the rate of five miles an hour.

However, according to these observations, as well as those of Broughton, it may be said that generally the rate of the Japan Current near the coast of those islands is a mile and a half to two miles an hour in July, August, and September, and that its rate depends on the distance from the coast. It is also of course influenced by the monsoons which prevail in those latitudes, and it must be observed that in those parts in November it becomes more northerly, and in July more easterly.

Between the lat. of 21° and 42° N., and the meridians of 178° and 163° E., its direction has been found principally East and E.N.E., its rate varying from ten to seventeen miles a day. But between 40½° and 37° N. lat. and the meridians of 162° and 133° W., its general direction was N. 50° E., and its rate from sixteen to eighteen miles a day.

In 21° 20′ N. lat. and 163° W. long., on its southern limit, where it comes in contact with the North equatorial current, the temperature of the Japan current was 77° to 79°, that is, about 4° above the temperature of the equatorial current at its northern limit in this part of the Pacific Ocean. In 27½° N., and 177° E., the temperature of the current was 81°. It then gradually decreased to the northern limit of the current, and in 43° N., and 162° E., was 55°. On leaving this current the temperature falls to 56°, and as far as Kamtschatka is between 51° and 49°. This shows that the sea near the coast of Asia is comparatively warmer; and confirms the assertion that in those parts it never freezes, notwithstanding the cold that is found there.

On a return voyage to Monterey, in again crossing this current the following observations are made:—In 45° N. lat. ,and 164° W. long., beyond the current at its northern limit, the temperature is found to be 52° and 54°; on the northern limit of the current 50°. In 43° 30′ N., and 161° W., it is found to be 64°.

The temperature of the current gradually falls to the eastward. In 36° N., on the parallel of Monterey, and 128° W., the temperature of the current almost mingled with the waters of the current of California, and found to be 61°. Thus in a space of 55° of longitude the falling of the temperature of the waters of this current is nearly 20°, as it flows towards the American coast, between the parallels of 27° and 36° N.

By the foregoing it appears that the warm Japan Current crosses the whole of the North part of the Pacific Ocean, and is felt as far as the N.W. coast of America. This fact is mentioned by all navigators who have crossed this part of the Pacific. They speak of a current

flowing East and E.N.E., and attribute it to the prevailing winds varying from N.W. to S.W. These winds without doubt partly contribute to form this current; but its temperature above that of the adjacent sea does not admit of their being the cause of it. Besides, this current clears up the well known fact of the easterly currents, which many navigators have mentioned, to the westward and in the latitude of the Sandwich Islands, a fact which has not been accounted for until now. Moreover, it explains the cause of Fleurieu's whirlpool, to which we shall shortly allude.

Current of the Coast of Kamtschatska.—The Kamtschatka Current, as before said, is a branch of the Japan Current, flowing N.E. and N.N.E. along the Asiatic coast towards Behring Straits. It separates from the Japan Current on the meridian of 150° E., and on the parallel of 38° N. Its eastern limit passes West of the Aleutian Islands, and also West of St. Matthew and St. Lawrence. From there it continues up through Behring Straits into the Frozen Ocean, in a N.W. direction, N.E. on the coast of America, and North in the middle of the strait.

Kotzebue, in Behring Straits, found the rate of this current from one mile and a half to two miles an hour. M. de Tessan found in the latitudes of Petropaulovski a rate varying from seven to ten miles a day in an E.N.E. and N.E. direction.

Behring Current.—Behring Current appears to be formed by the surplus waters carried to this strait by the Kamtschatka Current not finding a sufficient outlet by this strait. It may also originate from other causes besides, and sufficient observations are not yet collected to show whether this is a warm or a cold current.

This current flows from the straits of the same name principally in a S.S.W. direction. In proportion as it reaches to the southward it increases so as to envelope the whole chain of the Aleutian Islands, and is found very strong in the channels formed by them. Its eastern limit follows the N.W. coast of America; its western limit from Behring Strait passes East of the Isles St. Lawrence and St. Matthew; and to the southward a little West of the most western of the Aleutian Islands.

Southward of Behring Strait the temperature of this current is 47°; N.E. of the Aleutian Islands, 47° also; S.E. of the same islands, 51°; near the Aleutian Isles and S.W. of them it was 49°. The maximum of its rate in the same part was nineteen, its minimum five miles, and its mean rate was about fourteen miles a day.

Fleurieu Whirlpool.—"In the eastern part of the Pacific Ocean," says Johnstone, "there is a singular phenomenon, which I have named Fleurieu Whirlpool, because this learned hydrographer was the first who mentioned it in his account of Marchand's voyage. It sets from East to West, and appears to turn in a direction similar to that of the hands of a watch, from left to right, or as the course of the sun appears in our hemisphere. The radius of the irregular figure which it describes, approaching that of a circle, is nearly 240 miles.

"It occupies the space comprised between the parallel of 25° and that of 40° N. lat., and the meridians of 133° and 155° W. long. It is found near the North limit of the Equatorial Current, and also near the commencement of this current, in the eastern part of the Pacific Ocean.

"As Lutké crossed it and did not deny its existence, it may be regarded as probable."

It is sufficient to glance at the accompanying chart of the currents to perceive that the supposed whirlpool is no more than that apparent rotatory movement produced by the South limit of the Japan Current at its eastern end and the northern limit there of the Equatorial Current.

Cold Current of the American and Californian Coast.—Along the N.W. coast of America South of Cape Tshirikoff, and along the coast of California, a cold current is found, setting principally to the southward and along the indentations of the coast. It varies in its distance from the coast, but may be generally considered as 300 miles across. When it reaches the coast of Lower California it turns more westerly in proportion as it reaches further South. At Cape San Lucas it runs nearly W.S.W. and loses itself in the North Equatorial Current.

The temperature of this current appears to increase rapidly in proportion as it is found near the equator. On the parallel of Monterey it was 57°; on that of 30° it was 59°; and on that of Cape San Lucas, 72°. The rate of it is about fourteen or fifteen miles a day. The maximum is twenty-two miles, and its rate is greater near the coast than out at sea, and it is most at the entrance of the Gulf of California.

Current of the West Coast of Mexico.—In concluding this view of the general currents of the Pacific Ocean we have only to allude to the periodical current of the Mexican coast,—an occasional current caused by the monsoon which prevails there. Humboldt is the first who mentions it, and Basil Hall and Beechy have since contributed observations on it.

The Mexican Current extends from Cape Corrientes northward of Acapulco to the Cocos Islands. Its outer or western limit is about twenty leagues East of those islands, which are in the counter-current found near this limit. This current follows along the coast of Mexico, with a breadth of nearly 360 miles, and has a counter-current in the opposite direction at its inner limit, close in shore. From December to April the course of the Mexican Current varies from S.E. to E.S.E. From May to December its direction is changed, being from N.W. to W.N.W., and its rate depends on the strength of the monsoon by which it is occasioned. Its importance to the navigation of the coast will be readily perceived.

The following table gives a general view of the currents of the Pacific, showing the mean rate of each from different voyagers.

Comparative Table of the Mean Rates of the Currents in Twenty-Four Hours.

South Pacific Ocean.

South Equatorial Current		24 miles.
Counter-Current of the Pacific Ocean		20 ,,
Current of Cape Horn		18 ,,
Humboldt Current		15 ,,
Mentor Current		16 ,,
General Current of Australia		12 ,,
Periodical Current of Australia	off the coast	6 ,,
	out at sea	16 ,,

North Pacific Ocean.

North Equatorial Current	30 miles.
Counter Equatorial Current	15 ,,
Monsoon Current of the Carolines	3 ,,
Japan Current	31 ,,
Cold Current of the American and Californian Coast	16 ,,
Kamtschatka Current	8 ,,
Behring Current	14 ,,

(To be continued.)

THE SHIPPING INTEREST.

A work entitled the *Wrongs of Shipping*, by Mr. Digby Seymour, has just gone into its second edition, but we much doubt if a more important piece of information is to be found in it than the following, on which a volume of commentary might be produced, but which we consider better for our readers in its plain brief state, as being more likely to obtain that attention which it deserves.

A fact has recently been brought under our notice which betrays a state of things in the building of merchant shipping that we could not have believed had not the proofs of it been actually in our possession. And it so deeply affects the character of our shipping that for obvious reasons we must be content with stating general particulars that have come before us, for the sake of placing the captains of those ships, with their crews, on their guard that such things are, and that they may provide against them *as they can.*

A British merchant ship was recently cast away on the coast of India, and as a matter of course she soon went to pieces. The sea did its work, but that was facilitated by her builders having done *theirs.* One would suppose that theirs was to be particular about her fastenings, &c., on which, of course, the safety of her crew and cargo so much depends, especially if she happens to get on shore, as was the case in the present instance.

When a Lloyds' Surveyor looks at a bolt—such, for instance, as those which secure the knees to the timbers and beams for carrying the decks—he, good man, supposes that it is of the proper length and goes through all into the timber and beam as it should do, and is secured with a ring at its outer as well as its inner end. But, unfortunately, ships will get cast away, and thus not only auger holes in the bottom admit the daylight, as several cases have proved, but also bolts for the purposes abovementioned are found to be not more than *three inches* or so in length, instead of some eighteen or twenty! and these terminated in a pointed end and barbed, so as to hold in the wood!

It is scarcely possible to conceive anything more monstrous than a ship thus put together, with just a sufficient number of bolts to keep her timbers together and the rest of the full complement of these articles made up by sham! This is bad enough, but this is not all.

As if this were not sufficient in the way of business, even these bolts will be made to pass off for copper (!) by simply having a copper ring round their heads, with a bit of the same material beat down upon it, as is usual in securing the end of the bolt; so that to all appearance the ship, advertised as "well built and copper-fastened," will turn out not to have more than half her complement of bolts, and these of iron with copper rings round their heads, with plenty of sham ones. Certainly we do meet sometimes with an acknowledgment that a ship is advertized as "*appearing* to be copper-fastened and *said* to have been recently sheathed, &c.," but these are very scarce, and generally the "well-built and copper-fastened good ship," unblushingly appears as the character of the specimen above described.

What will the Shipping Interest say to this, or will that Interest content itself with sitting still and trusting to insurance to cover all. Whatever course that Interest may take there is the evil, and for the sake of the character of British shipping it is the duty of that Interest to root it out. Of what use is their Lloyds' character after this? The Surveyor knows perhaps the age of the ship, and he sees the ends of sham bolts, which appear to be copper and in proper number, and he of course confirms the character of the ship.

The owner has bought the ship and secures himself from loss by insurance,—What matters to him what becomes of her? The merchant freights her and he of course does the same: so that neither of these parties loses by her. But a seaman takes command of her and, with his crew, embarks. She touches the ground somewhere in the course of her voyage, and, like the ship to which we have been alluding, she falls to pieces with marvellous ease. All is put down to sea risk—all lost, and perhaps he and his crew along with her; for a total loss is well known to be best for all parties,—documents are produced and there is an end of the matter,—but partial losses are troublesome things.

Can seamen be blamed for not trusting themselves in some of our merchant shipping? They not only are, but also imprisoned. The pump sometimes tells a true tale, but how such ships are built may be seen in some of our mercantile yards, which ought to be open *at all*

times to the inspection of a Government Surveyor; and of these there should be plenty of honest men and true, to prevent, by day or night, sham fastenings, in the way of short bolts and copper rings round iron to make them pass for copper, for such things, we assert, have been brought to light.

Again we must acknowledge our primitive ignorance of facts in which we have been initiated since the foregoing was committed to paper. When we commenced this journal we were not aware that ships were lost on rocks moved far out of their places for that particular purpose; we did not then know that certain ships were *purposely* lost; and we had yet to be informed that there were such things as *Devil's bolts!* (what an appropriate name) in yards where merchant ships are built; After these specimens of man's handiwork, who can have confidence in *his* works while *insurance* is allowed to flourish.

Let us hope that the following gunboats, to be built at merchant yards by contract, will be turned out of hand without Devil's bolts in them.

The papers state that the number of new gunboats for which the Government have just made a contract is eighteen. They are understood to have been taken by six builders at the following prices:—Green, two at £24 15s. per ton; Wigram, four at £21 10s.; Mare, three, at £21 10s.; Russell, four at £20 10s.; Miller (Liverpool), two, price not stated; Langley, one at £24; Pitcher, one at £25; and White (Cowes), one at £25.

ITALIAN PORTS,—*Ancona and Leghorn.*

The port of Ancona, one of the most interesting places of this part of Italy, belongs to the States of the Church. It is the chief place of the province af the same name, having a population of 165,000 inhabitants,—three cities, seventeen towns, and forty villages and hamlets.

The town is seated at the foot and to the West of a mountain, remarkable for its white appearance, and forming a kind of elbow on the coast. It is bordered by handsome jetties, forming an arc of a circle, with a pier at each end, in the same position as those which had been constructed by Trajan in marble. In acknowledgment of this a triumphal arch was erected by the inhabitants in white marble on the northern pier. Another building of the same kind has been erected in honour of Pope Benoit XIV., who had been Bishop of Ancona, and who had contributed much to its prosperity.

The town is indeed an offshoot of Syracuse, and has been successively in the possession of the Romans, the Goths, the Lombards, and the Saracens; since which, it has emerged from its lost condition, and has constituted itself into a republic. After having remained for

many years under the protection of the Pope, it was incorporated, in 1532, with the States of the Church, and has ever since formed a part of them. In 1732 the port was declared free by Pope Clement XII., since which time its commerce has continued to improve. It is governed by liberal laws, and its excellent and generous system is highly favourable to navigation, which forms its principal source of industry.

The port is protected from the sea to the northward by a large pier of 600 yards in length, which is again joined at right angles by a smaller interior one, which for a long time formed its only shelter from the sea. There are some rocks to the North of the molehead outside of a rocky point, and it is between this point and the old mole or the commencement of the new one which was the old lazaret; but ships being badly sheltered there by the rocks off the point, could not lie in safety. It is in the middle of this old mole that the beautiful triumphal arch of Trajan is situated.

The harbour is about five cables' length from North to South from the northern pierhead (on which stands a revolving light) to the lesser mole, and encloses the harbour in a manner approaching a circular form, it also encloses a large islet, which is entirely occupied by the establishment of the new lazaret, a magnificent building enclosed by a pentagon with a bastion to the N.W. Communication is maintained between the lazaretto and the southern part of the town by a bridge. The new lazaretto is to the West of the fort, terminating the line of fortifications which surround Ancona.

There is a little bank, about sixty yards long from N.N.W. to S.S.E., and about thirty yards wide, lying parallel to the little mole, and small vessels and boats can only enter this part of the port, in which there is not above 7 or 8 feet water, as well as in the channel which surrounds the lazaretto. There is also another small bank very close and nearly within the molehead. The port of Ancona is not very large, but it is safe. The greatest depth is in the direction from one mole to the other. There is a depth of 24 feet in the middle of the entrance, 28 near the lighthouse, and 16 feet at the head of the little mole.

Inside the great pier there are from 14 to 16 feet, but it is near the head of it off the lighthouse that the deepest water is found, and which is about 30 feet. Within the smaller pier, which runs at right angles to the larger one, there is not more than 11 to 12 feet water. In the middle of the port there is 14 to 16 feet, and at a short distance from the quays there is from 10 to 12 feet. The town is handsome, abounding in all kinds of supplies, and a vessel arriving in the port anchors as soon as she has passed the molehead.

It will be seen from the foregoing that large ships of war or frigates cannot use the port, but are obliged to anchor outside off the coast about a mile or a mile and a half North of the lighthouse, in 10 to 15 fathoms. The town of Loretto, seated on an eminence, Mount Conero and that of Ancona, the buildings and citadel, and the change in the direction of the coast (next to the light) with the latitude, are the best means of finding Ancona.

The population of the town has more than doubled since the commencement of this century, and now amounts to 45,000. Among the public buildings the most remarkable are the cathedral, the bank, and the theatre. The citadel and arsenal are also worthy of notice. Ancona exports corn, timber for shipbuilding, hemp and cordage, leather and cured hides, skins, wool of all kinds, saffron, raw silk, tallow, tobacco, and other articles of secondary importance.

Eight miles N.W. of Ancona is the town of Sinigaglia, not large, but celebrated for its commerce, and known in Italy for its important mart. It has also a port at the mouth of the little river Nigola. In the district of Ancona there are two places which should be mentioned; one of which is Osimo, on the Musone, with 7,000 inhabitants, and the other Jesi, a manufacturing and commercial town.

The town of Leghorn belongs to the province of Pisa, one of the five districts of Tuscany, and possesses one of the busiest ports in the Mediterranean. It was declared free by Ferdinand the Third in 1817, a wise measure, which contributed much to its development. In 1120 Leghorn was nothing more than a village of fishermen, the traces of its limits at that period being still visible: but three centuries later it became a port of commerce, and assumed some importance of a military character.

The celebrated Knight of Florence, Jean the Banker, in 1423 founded a bank there, which became highly prosperous from large connections in the Levant. The example was extensively followed, and in 1630 Leghorn had risen to become a port of the first order, with a population of 18,000: in another century it had 30,000: in 1800 it was 50,000, and at present it amounts to 85,000, including the inhabitants of its three suburbs. The Jews suburb is the most considerable, with its straight streets and well build edifices, besides a superb synagogue. Leghorn has several churches and handsome cemeteries, among which that of the English is worthy of notice,—and also a goodly collection of funeral monuments. Among these is a marble statue of Ferdinand the First, who died in 1608, and whose reign is justly esteemed: the lazaret of Leopold is also one of the largest and handsomest in all Europe.

The English seem indeed to have long had a strong predilection for Tuscany, owing, perhaps, to the excellence of its climate as well as the mildness of its government.

Besides a small mercantile harbour, Leghorn has a noble safe roadstead along its shore, and also a considerable pier, constructed by a French engineer; a lighthouse built on a rocky islet outside and to the South of the town; the tower of Marzono to the North of it, surrounded by the sea. The monuments of the town and the masts of shipping in the roads, indicate to an observer from the sea how much such difficult sites are esteemed, and that the shipping find them excellent shelter.

The roadstead is between the Meloria Bank and the town, ships anchoring to the N.W. of the lighthouse and East of the Meloria Tower; the light is intermitting, being alternately red and white,

separated by dark intervals, and is seen about twenty miles off. The lighthouse is surrounded by rocks and shoals, and the Meloria Tower has been erected to point out the rocky bank which bears its name. It is a most convenient anchorage, and requires only that ships using it should have good ground tackle.

The port within the roads is nearly rectangular, protected from the sea by a long pier, which extends from the bastion of the lighthouse for about 650 yards N.N.W., and is terminated by a double-tier battery. A handsome quay, 430 yards long, perpendicular to the pier, forms the interior of the port, and is connected with the quay by another at right angles, that is also of the same extent, terminating at its entrance. There are also two basins, with an entrance, 300 yards across, common to both, but they can only receive vessels of a moderate size; they are to the N.W. of the town, and will receive ships not drawing more than 15 or 16 feet water. The western part of the port is much obstructed by a bank of sand, scattered with rocks, some of which are uncovered,—it occupies about half the port, with notmore than 3 or 4 feet generally over it,—it lies parallel to the direction of the mole, and between them is a depth of 12 to 15 feet in half of its length, and 8 to 12 feet in the other half. But there is a depth of 18 feet towards the molehead.

To the North of the port and the two basins, a long wall separates these from the town. In the middle of it a handsome fountain may be observed, over which is a group of four colossal bronze statues, called the four giants. A branch of the Pisa Canal passes by the fortifications to the North, and at a short distance to the S.E. of the town is Cape Montenegro, which forms a good landmark for mariners.

The island of Elba belongs to the same province as Leghorn, with its principal town of Port Ferrajo, the population of which at present amounts to five thousand.

Nautical Notices.

Position of Roe Bank, *off the West Coast of the Malay Peninsula.*

Roe Bank (of 8½ fathoms) appears by Horsburgh to have been discovered by Captain Roe, in the ship *Henry*, on the 31st July, 1822, while on her way from Penang to Calcutta, and placed by him in 9° 59′ N. and 96° 50′ E., by reckoning.

In 1825 (25th July) the same commander, on his way from Rangoon to Madras, we are informed by the same authority, "again got on this bank," and "from this day's observation made the bank in 10° 2′ N. and 96° 46′ E., by chronometer," which would place it, as

stated, "about West seventy-five miles from the southernmost islands of the St. Andrew group."

Now it is unfortunate that this part of the Malay coast does not yet seem to have undergone the examination of the able surveyors of the East India Company's Service, and is therefore in an unsatisfactory condition as far as regards navigation. At least we have seen no large scale chart of it, as we have of the coast a little North of it. We are not surprised therefore at Captain Heckford stating in a letter, "From my long experience on this coast I am led to believe that Barren Island, Narcondam, Elephant Point, Amherst Point, and the Torres and Seyar Islands, are placed five miles too far to the westward, and which future observations I have no doubt will confirm."

But Captain Heckford's experience of the coast has enabled him to send us an important extract from his log, which will go far to establish the position of this bank in the unsatisfactory condition of the charts. On the 17th June we received the following from him, with the copy of the day's log of the brig *R. A. Maria*, from Calcutta to Singapore, from which we make the extract:—

Forest Gate, Essex, 16th June, 1859.

Sir,—With reference to my letter dated 21st March, I have now the pleasure to forward you enclosed a copy of the day's log, dated 10th May, 1849, relative to the discovery of a shoal in lat. 10° 20′ N. and 97° 10′ E., as also copy of the log dated 6th May, 1849, having received the same by the mail of the 10th inst. from Calcutta.

I have, &c.,

N. Heckford.

To the Editor of the Nautical Magazine.

Thursday, May 10th, 1849.—At 5h. 30m. a.m., daylight, standing E.S.E., with a light wind from South and smooth sea. Observed rocks under the bottom; took a cast of the lead and found 11 fms.; kept the lead constantly going, and had overfalls from 13 to 18 fms. At 8h. 30m., 30 fms.; next cast, no ground with 50 fms. Whilst passing over the shoal observed the bottom to be very uneven, and some of the pyramidical rocks apparently with much less water on them. Land in sight from the mast-head, bearing E.½S. Long., by chronometer, 97° 10′ E.; latitude, reduced from noon, 10° 21′ N.; and as Roe Bank is in 96° 45′ E. and 10° 2′ N., and 95 miles West of St. Matthew, I consider that shoal *out* 35 miles of its true position, or the shoal passed over by me to be a discovery. The portion passed over appeared to extend E.S.E. and W.N.W. about five miles; but as I was on the shoal at daylight, I am unable to state its full extent. At 8h., tacked to the W.S.W. At 8h. 30m., got the galley boat out to try the current, and found it setting slightly to the northwestward. In galley boat at 11h.; shoaled again to 17 fms., the rocks plainly visible, and a light breeze sprung up; braced on the starboard tack, and at noon had 28 fms., well 5 miles, lat. 10° 20′ N.

With the foregoing before us, it was evident that there were either two banks, one found by him and the other by Captain Roe, for, as Captain Heckford says, there is a difference of eighteen miles of latitude between them, and there appears also a difference of longitude amounting to thirty minutes. In order to reason from admitted facts of the subject, we addressed a few queries to Captain Heckford, to which we have received the following replies:—

18th June, 1859.

Sir,—In replying to your inquiries, I beg to state that the eye of the observer was elevated eighty-two feet above the level of the sea (from the main royal yard), and that in my opinion then (as now) the land seen was the peak of St. Matthew. The bearing was taken from a compass on the rail near the gangway, with a long batten placed across the compass-box, for the observer (aloft) to give a bearing as near as possible, which is magnetic, and not corrected for deviation. The distance I considered to be about twenty-one leagues.

I would here beg to add that the position assigned to the bank is in accordance with the longitude of the Seyer Islands. But from my long experience on this coast, I am led to believe that Barren Island, Narcondam, Elephant Point, Amherst Point, and the Torres and Seyer Islands are placed five miles too far to the westward, and which future observations I have no doubt will confirm.

I would also beg to state that I am fully convinced there is eighteen miles difference of latitude between Roe Bank and the one discovered by me, whatever may be the relative positions of these banks as to their true longitude.

I have, &c.,

N. HECKFORD.

To the Editor of the Nautical Magazine.

With the foregoing data we are inclined to conclude that Captain Roe's chronometer was likely to be about thirty minutes too far West, because Captain Heckford's distance of the bank from the land is checked by the sight of St. Matthew's Peak from the mast-head, and which he concludes to be about twenty-one leagues.—(The chart makes it sixty-two miles.) But the bearing of St. Matthew's Peak (if the latitude of this peak be correct, and as we believe with him it is that which he saw) by no means agrees with that so carefully taken by Captain Heckford. From Captain Heckford's latitude and longitude of the bank, the peak would really bear E. 19° S., or about E.b.S.$\frac{3}{4}$S., and not "E.$\frac{1}{2}$S." For, with the peak on this bearing of "E.$\frac{1}{2}$S.," Captain Heckford's position must have been in about 10° 6′ N. lat., assuming his longitude to be nearly right, and which we consider it to have been; while at the same time that position agrees better with Captain Roe's position in latitude, although differing largely from it in longitude. And we consider this difference in longitude to be more probable than that Captain Heckford should have been deceived in his view of the peak from his ship, that enabled him thus to render an important service to the chart in fixing it by

his bearing and distance, as we know the peak to be 3,000 feet high, and therefore clearly within the horizon of Captain Heckford's masthead.*

We thus leave Captain Roe's bank in the lat. of 10° 6′ N., on the authority of Captain Heckford's bearing and distance of St. Matthew Peak, with the longitude assigned by him of 97° 10′ E.; and are inclined to believe that one bank only will hereafter be found to have given rise to the question.

Since the foregoing conclusion we have discovered that it is not unlikely Captain Heckford may have an old edition of Horsburgh's chart, in which the coast in question may not have been corrected.

Turkish Lights.

The following appears in the *Moniteur de la Flotte*:—

Tariff of Lights in the Ottoman Empire for Vessels Sailing between the under-mentioned Ports.

Art. 1.—Vessels from the Archipelago, or from any other intermediate point in the Archipelago, touching at Constantinople, the Turkish ton,—40 paras; for every ton over 800 tons, 20 paras.

Art. 2.—Vessels from the Archipelago to the Black Sea, and *vice versâ*, passing the Dardanelles and Bosphorus,—the ton, 60 paras; for every ton over 800, 30 paras.

Art. 3.—Vessels from Constantinople or any intermediate point to the Black Sea, and *vice versâ*,—the ton, 12 paras; for every ton above 800, 6 paras.

Local Coasting Vessels.

Art. 5.—Between the entrance to the Dardanelles and Constantinople,—for every ton, 20 paras.

Art. 6.—Between Gallipoli and Constantinople,—the ton, 15 paras.

Art. 7.—From Kara Bornou or Kili (Black Sea) to Constantinople,—the ton, 15 paras.

Art. 8.—Between Tinee Ragtehee and St. Stephano, at the entrance of the Black Sea,—from 5 to 49 tons, and from 50 to 99 tons, by the ton.

Art. 9.—Tugs pay the annual sum of 1,826 piastres.

Art. 10.—Steamers with passengers from the Bosphorus to Prince Island and St. Stephano pay 50 piastres a year.

* That horizon was about 12 miles and that of the peak is 59 miles, making 71; while by the chart he was 62 miles from it, and therefore 9 miles within the distance he would be from it if seen *on* the horizon from his masthead.

General Observations.

Vessels under five tons are free from all duties.

Lighthouse rates are compulsory both going and returning.

As there will be thirty-six lights, half the duty will be charged when half (that is eighteen) of the lights are in use. The whole duty will be charged when the lighting is complete.

The Ottoman Government are at present employed in constructing lights, which will still remain to be finished after the channel lights are completed. The following is a description of them, and this will hereafter be published in the form of books, as soon as the works are finished.

Archipelago.

Cape Sigri.—A revolving light of the first order, range 24 miles, on the small island of Sigri, West coast of Myteline.

Point Ponente.—Fixed light of the third order, range 14 miles, on the West point of Tenedos.

Gadaro.—Light of the fourth order, varied with an alternate red light, range 12 miles: Gadaro Isle one mile E. 23° N. of the tower.

These three lights are yet intended.

Dardanelles.

Cape Helles.—A revolving light of the second order, range 18 miles, on Cape Helles on the European side, southern entrance to the Dardanelles.

Seddul Bahr.—Two fixed green lights, range 4 miles, on point Seddul Bahr, first castle of Europe, two-thirds of a mile East of Cape Helles.

Koum Kaleh.—Two fixed red lights, range 4 miles, in the western battery of the Koum Kaleh.

Point Kefis or Barbers Point.—Light of the fourth order, varied with red flashes, range 12 miles, on a ruined battery one mile S.W. of Barbers Point, coast of Asia.

Chanak Kaleh Si.—Two fixed red lights, in the lower battery of the second castle of Asia, range 4 miles. A single red light is provisionally placed on this castle about six feet above the water, but this will shortly be changed.

Namasieh.—Near Kilid Bahr. Two fixed green lights, range 4 miles, placed in the battery of Namasieh (coast of Europe), three-quarters of a mile to W. 8° S. and opposite Chanak Kaleh Si.

Nagara Kaleh Si.—Light of the fourth order, varied by red flashes, range 12 miles. On the tower of the castle of Nagara, coast of Asia.

Bovali Kaleh Si.—Two fixed green lights, range 4 miles, the same as the two following, on the battery of Bovali (coast of Europe), opposite and N. 37° W. of the castle of Nagara.

Point Bourgas or Peskieri.—Two fixed red lights on the point Peskieri (coast of Asia), N. 25° W. of the town of Bourgas.

Point Galata.—Two fixed green lights on Point Galata (coast of Europe), opposite and North of Point Peskieri.

Gallipoli.—Revolving light of the second order, range 18 miles, on the tower nearest to Gallipoli, on the West coast of the northern entrance to the Dardanelles.

Point Tcherdakh.—Two fixed red lights, range 4 miles, on Point Tcherdakh, eastern coast of the northern entrance to the Dardanelles.

With the exception of those of Seddul Bahr, Point Kefis, and Point Bourgas, all these lights are in use.

Sea of Marmora.

Cape Khoraz.—Revolving light of the second order, range 8 miles, on Cape Khoraz, a mile and two-thirds from the village of the same name.

Erekli.—Fixed light of fifth order on the South point of the coast of Erekli, range 8 miles.

Off Marmora Island.—Light of fourth order, with red flashes, range 12 miles. Placed on Beacon Island, about half a mile East of Marmora.

Koutaly.—Fixed light of sixth order, range 8 miles, on an island on the western side of the entrance between Koutaly and Rabby.

Point Palaia.—Two fixed red lights, range 4 miles. On the West point of the peninsula of Cyzique, in the channel of Tarrodia.

Cape San Stephano.—Flashing light of the third order, range 4 miles. On the point San Stephano, 722 yards E. 22° 30″ N. of the Sultan's mosque.

None of these are yet in use, excepting those of Beacon Island and Cape San Stephano.

Bosphorus.

Seraglio Point.—Flashing light of the third order, range 14 miles.

Fener Bagtchi.—Fixed light of fourth class, range 10 miles. On the point of the same name South of Scutari.

Leander Tower.—(Coast of Asia). Two fixed red lights, range 4 miles.

This light and the two preceding are in use; the eight following fixed lights, the range of which is 4 miles, are not yet in use.

Point Defterdar.—Two fixed green lights in the village of Orta Keni, coast of Europe.

Kandib-li.—Two red lights on the point of the same name (coast of Asia).

Roumeli Hissar.—Two green lights on the point of the same name (coast of Europe).

Kanlizeh.—Two red lights on the point of the same name (coast of Asia).

Yeni Keni.—Three green lights in a vessel moored off the end of the bank of Yeni Keni (coast of Europe).

Therapia.—Two green lights placed on the battery of Kefeli Keni (coast of Europe), one mile N. 55° W. of Therapia.

Oumour or English Bank.—Three floating red lights in a vessel moored off the end of the English Bank (coast of Asia).

Fort Kavak.—On Point Jeron (coast of Asia); two red lights.

The two following lights, of the third order,—range of the former 15 miles, and the latter 14,—are in use.

Anatoli Fanar.—A flashing light (a red flash, succeeded by two white flashes) is placed on the tower of Anatoli, on the East side of the northern entrance of the Bosphorus.

Roumili Fanar.—A fixed light on the tower of Roumelia, West coast of the northern entrance to the Bosphorus.

Black Sea.

There are as yet only two revolving lights of the first class, range of both 24 miles: the first having an interval of ten seconds, and the second an interval of one minute; but the first is as yet the only one in use.

Cape Bouroun.—On the cape of this name, twenty-two miles W.b.N. of the entrance to the Bosphorus.

Cape Kili.—Twenty-two miles E.b.S. of the entrance to the Bosphorus.

[In our vol. for 1857, p. 382, and for 1858, p. 209, will be found former mention of these lights.—ED.]

PASSAGES OF H.M.S. "HIMALAYA."

From England to St. Vincent.

1857.					1859.				
Dates.	Miles made good.	Coals used. Tons.	Wind and Force.	Remarks.	Dates.	Miles made good	Coals used. Tons.	Wind and Force.	Remarks.
Apr.					Feb.				
17	79	34	S.S.E. 7	It appears by the log there was only one day's foul wind in this passage, then very light.	25	136	48	W.N.W. 3	Light winds and fine weather the whole way.
18	152	45	South. 5		26	235	60	S.W. 2	
19	178	46	S.W.½S. 2		27	237	55	W.N.W. 3	
20	215	46	N.b.E. 2		28	250	50	N.E. 1	
21	177	13	N.E. 4		Mar				
22	172	..	,, 4		1	249	50	S.W. 1	
23	172	..	,, 4		2	237	53	S.E. 2	
24	127	6	,, 2		3	256	49	East. 4	
25	170	25	East. 4		4	229	32	E.b.N. 4	
26	159	..	S.E. 2		5	234	32	E.b.N. 2	
27	151	23	N.E. 1		6	200	30	East. 2	
28	223	42	,, 1						
29	235	46	,, 1		9 d. 22 h.	2263	459		
	56								
13 d. 4½ h.	2266	326							

From St. Vincent to the Cape of Good Hope.

1857.					1859.				
Dates.	Miles made good.	Coals used. Tons.	Course steered.	Wind and Force.	Dates.	Miles made good.	Coals used. Tons	Course steered.	Wind and Force.
May					Mar				
3	123	8	South.	E.N.E. 4	9	134	10	South.	N.E. 3
4	144	4	S.b.E.	E.b.S. 4	10	181	23	S.b.E.	E.N.E. 3
5	173	3	,,	East. 4	11	183	19	,,	,, 2
6	136	10	S.S.E.	E.b.N. 4	12	222	46	,,	East. 2
7	189	28	,,	Var. 1	13	217	46	,,	,, 1
8	150	35	S.b.E.	S.W. 1	14	210	50	South.	E S.E. 4
9	139	35	S.b.W.	S.E. 3	15	201	49	Sb.W.$\frac{1}{2}$W.	S.S.E. 5–7
10	171	32	,,	S.E.b.S. 4	16	218	50	,,	SEb.S. 5–7
11	168	34	S.S.E.	East. 4	17	204	49	South.	S.S.E. 3
12	140	45	S.b.W.	S.E. 4	18	209	50	S.S.E.	,, 3
13	186	34	S.S.W.	S.S.E. 4	19	232	52	,,	,, 2
14	191	40	S.b.W.	S.E.b.E. 3	20	242	56	S.b.E.$\frac{1}{4}$E.	,, 2
15	187	40	S.S.E.	E.b.S. 2	21	232	50	,,	,, 3
16	194	37	S.E.b.S.	E.S.E. 2	22	235	52	,,	,, 2
17	200	42	S.S.E.	Var. 1	23	245	52	,,	,, 2
18	201	42	S.b.W.	S.E. 1	24	244	55	,,	,, 2
19	191	41	S.S.E	E S.E. 3	25	261	56	,,	E.S.E. 2
20	220	48	,,	East. 2	26	261	56	,,	Var. 1
21	219	53	,,	E.N.E. 3	27	250	56	S.S.E.	S.W. 4
22	248	50	,,	S.E. 2					
23	259	51	,,	East. 2	19	4181	877		
24	257	51	S.E.	E.b.N. 2					
25	168	40	,,	,, 4					
23	4254	803							

1857.

England to St. Vincent	13d.	4h.	30m.
St. Vincent to the Cape.....	22	23	40
Whole time of voyage	39	1	50
At sea	36	4	10

1859.

England to St. Vincent	9	22
St. Vincent to the Cape.....	18	21
Whole time of voyage	30	20
At sea	28	19

In making a passage to the Cape in H.M.S. *Himalaya,* or any *powerful steamer,* I should say take the inshore passage and coal at Sierra Leone. Then I would keep a little inside the straight line, so as to make the land in 26° or 27° S. By doing so you will avoid the S.E. Trades, as it is well known the prevailing winds in the Bights of Benin and Biafra are from W.S.W. to W.N.W. By taking this

route instead of the St. Vincent one you will save nearly 1,000 miles; and I am of opinion you will have the fore and aft sails set as many days on the inside passage as on the outside one, provided the ship is on her course; and my experience has taught me, in a ship like this, if you want to make a passage you must not go looking for winds, take every advantage of what you find in your track, but do not go out of your way to look for them, you cannot spare the time.

I find we make from 200 to 240 miles a day facing the Trade, force from 2 to 5. Three boilers expending from 45 to 52 tons of coal per diem, so there is no fear of being short of coal, and I feel sure this ship will make the passage from Sierra Leone to the Cape nine times out of ten in fifteen days.

From the Cape to St. Helena, St. Vincent, and England.

Date. 1859. May.	Miles made good.	Coals used Tons.	Courses steered.	Winds.	Force	Remarks.
1	136	40	NN.W.½ W.	N.b.W.	2	Engines stopped for twelve hours, being obliged to take off the cylinder cover of the after engine, the junk-ring having become loose.
2	179	38	,,	N.b.E.	2	
3	218	50	,,	N.N.W.	4	
4	198	52	NN.W.¼ W.	,,	5—8	
5	232	52	,,	South.	2	
6	251	50	,,	S S.E.	3	
7	251	50	,,	S.E.b.S.	2	
8	245	48	,,	,,	2	Stopped at St. Helena seven hours.
9	163	30	N.b.W.¼ W.	S E.	2	
10	240	50	,,	,,	2	
11	226	46	N. ¼ W.	,,	3	Stopped five hours to take off brass of trunk bearings.
12	236	50	North.	,,	2	
13	221	49	,,	E.S.E.	3	
14	214	50	,,	Variable.	2	
15	241	52	,,	Calm.	0	
16	208	50	N.b.W.	N.N.E.	4	
17	209	52	N.b.W.½ W.	North.	5	
18	207	52	N.b.W.¼ W.	,,	5	
19	143	40	N.b.W.	N.E.	3	
20						Stopped at St. Vincent to coal,—thirty-six hours.
21	109	30	N.N.E.	N.E.	5	
22	176	55	,,	N.E.b.E.	7	
23	252	55	,,	,,	7—3	
24	217	55	N.E b.E.½ E.	N.E.	3	
25	220	55	,,	East.	2	
26	222	55	,,	,,	1	
27	218	55	,,	,,	3	Whole time of voyage 31d. 6h.
28	233	55	,,	South.	1	At sea 28 8
29	217	50	,,	S.W.	1	
30	237	55	,,	South.	3	
31	233	55	N.E.b.E.	S.E.	5	
	95	30				
	6397	1506				

Start Point to Sierra Leone . .	S. 11° W.	2,551 miles.
Sierra Leone to the Cape . . .	S. 35° E.	3,141 „
		5,692 „
Start Point to St. Vincent . . .	S. 27° W.	2,255 miles.
St. Vincent to the Cape . .	S. 39° E.	3,958 „
		6,213 „

A reference to the foregoing tables will give the results of two voyages, both on the outside track.

Remarks on the Current from the Cape of Good Hope to Algoa Bay and Port Natal.

April 5th, 1859.—From Simon Bay to Algoa Bay thirty-six hours. Wind S.S.E., force 2. Ship to the eastward of her reckoning, 14 miles, which might or might not be current.

8th.—Left Algoa Bay for Port Natal. Wind S.E., force 4. Found the ship set in twenty-four hours S. 28° W. 102 miles.

10th.—Wind S.E., force 2 to 4. Found the ship set in the last twenty-four hours S. 41° W. 114 miles.

Passed H.M.S. *Hermes* on her way to Algoa Bay, and on our return there on the 23rd compared notes with the Admiralty Surveyor, Mr. Skead, and found both ships had the same amount of current to a mile.

21st.—Left Port Natal for Algoa Bay, and arrived on the 23rd; did not perceive any current.

24th.—Left Algoa Bay for the Cape; arrived on the 26th; did not find any current.

JOHN SECCOMBE, *Commander.*

I beg to call attention to the compasses. We found when approaching the Cape, and whilst on that coast, the deviation altered on some points as as much 13°.

CHARTS, *&c., Published by the Hydrographic Office, Admiralty, in June, 1859, and Sold by the Agent, J. D. Potter,* 31, *Poultry, and* 11, *King Street, Tower Hill.*

English Channel, 3 sheets, various authorities, 1859, (9s.)
Scotland, West coast, Loch Tuadh, Comdr. Bedford, R.N., 1857, (3s. 6d.)
Scotland, West coast, Sound of Harris, Capt. Otter, R.N., 1858, (5s.)
Nova Scotia, Beaver Harbour and view, Comdr. Orlebar, R.N., 1857, (3s.)
East Indies, Ports in Macassar Strait, various authorities, 1859, (2s. 6d.)
British Lights, corrected by Comdr. Dunsterville, R.N., to July, 1859, (1s 6d.)
French, Spanish, and Portuguese Lights in the Atlantic Ocean, corrected by Comdr. Dunsterville, R.N., to July, 1859, (1s.)
Admiralty, 20th June, 1859.

New Books.

EXPLANATIONS AND SAILING DIRECTIONS—*to accompany the Wind and Current Charts, &c. By M. F. Maury, LL.D., U.S.N., Superintendent of the U.S. Observatory and Hydrographical Office, Washington.* 2 vols. 4to., Eighth Edition.

The former of these volumes runs to 383, and the latter to 874 pages, with a proportionate supply of well engraved illustrations. No one can deny after this that Mr. Maury is not a painstaking man.

And well he may be so when he is laying the foundation year by year of a national compendium of hydrography,—one that is to be consulted by the ships of a large maritime nation, whose people are enterprising to the last degree, whose sea board embraces some thousands of miles in two oceans, and whose seamen are well known for their enterprising, enduring, and daring character.

We must not pretend to enter into any discussion on the subjects of these two important volumes, and weighty ones they will be found by those who have to use them, but the reference to which is much facilitated by "contents." For the present our readers will be satisfied to obtain an idea of those contents, which we may enable them to form by running down the subjects of the several chapters.

Thus volume i. contains chapters severally on these subjects,—the atmosphere, red fogs and sea dust, the winds, the geological (?) agency of the winds, the equatorial cloud ring, the salts of the sea, currents of the sea, the Gulf Stream, influence of the Gulf Stream upon climates, the depths of the ocean, the basin of the Atlantic, submarine telegraphy, the climates of the ocean, the drift of the ocean a new field (appertaining apparently to zoology), the specific gravity of the sea, gales, typhoons, and tornadoes; description of the charts; the Brussels conference. These form the subjects of the first volume, on each of which probably a volume might be written of what we do know, and another perhaps of what we do not know.

The second volume is less speculative, and we come direct to the plain straight forward requirements of the seaman. He may wander in amazement through the pages of the first volume, and wonder as he goes on at what he may learn, and see how much he has to learn of the stupendous works of the Great Creator of the universe, and admire the perfection of them and the beautiful manner in which he has poised the equilibrium by which Nature keeps Nature in her proper place everywhere. But in the second volume, is he destined for any part of the world, he has nothing to do but refer to the route and he sees at once how to shape his course. He may visit the four quarters of the globe, including Australia and the many shores of Polynesia, and he will be told by Maury the best way of doing so. All this to him is most important, and great credit is due to Maury for the elaborate pains he has bestowed on all these subjects. Yet we sometimes think that the duty of the hydrographer is to generalize, to make up his mind with reasons, for, as Pope observes,—

"From what can we reason but from what we know,"—

and then he might say which is the best made of doing anything and why it is so, and seamen, we believe, would thankfully follow his advice. Maury has collected a large mass of material,—the work of condensation should come next, and the size of these volumes seems to hint that it is necessary.

We perceive on the Australian route Maury differs from our directions; but he does it with so much grace and good feeling that one is glad to see the occasion which has given rise to it, and rejoice at the circumstance. There is

much in the great circle course doubtless, and there is much, too, in securing a good, strong, steady fair breeze,—this is certain in one case, but is it so in another. Will not light breezes, inconvenient clusters of small islands, and perhaps icebergs, lie in the seaman's way in the other. *Laissez allez—nous verrons—experientia docet*—one of these will decide the road. But our space warns us that we must stop.

LIGHTS IN LYRICS,—*or a Glance at the Channel Lights on a Run from Scilly to the Nore.* Potter, Poultry.

These Lyrics, reprinted from our own pages, with an addenda about the Compass, some highly interesting notes, a useful little chart, and a neat view of the dangerous Casquets, are here thrown together and form a useful companion at least for the Navigator or the Yachtsman who is fond of salt water and channel cruizing. There is something damaging to the character when our merchant captains lose their ships on the coast of France, and sail by a chart some twenty years old without its proper complement of lights, when such a chart as that with the Lyrics would give correct information which ought to be found in every ship, not only of the state of the lights, but channel soundings also. As it is expressly meant to assist the navigator, the lights being alluded to as leading marks, these appear all to be unexceptionable, saving in one, that of the Lizard Lights, which are E.b.S. and W.b.N. of each other, and not E.b.N. and W.b.S. as stated, the former being the channel course. They are well worthy of the attention of our seamen and carry with them their own recommendation.

PRESERVATION OF THE BOTTOMS OF IRON SHIPS.

We have long ago given our opinion of the great importance of Peacock and Buchan's composition for the preservation of iron and copper of ship's bottoms, and which by the unprecedented voyage of the *Himalaya* to the Cape and back has evidently contributed to her speed. It is not equalled by any yet invented, not only for its preserving qualities, but for adding, by its peculiar property of slipping through the water, the great advantage of speed. There was one tried once on the bottom of the *Industry*. The composition on one side of that vessel was the old-established preparation of Peacock and Buchan; the other side was overlaid by a preparation about four times as costly, the invention of a German Count. The result of the experiment proved that the new was not equal to Peacock and Buchan's composition.

About nine months since the *Himalaya* received a coat of Peacock and Buchan's composition, which seems to have contributed in a great degree to the rapidity of her movements. On her late remarkable voyage to and from the Cape of Good Hope *fifty-eight days only* were occupied at sea. Since the application of the composition the *Himalaya* has traversed 26,000 miles, and the authorities at Keyham are well satisfied with the result. Usually with such an amount of service a coat is given every six months. In the present case, notwithstanding the lengthened interval, the plates and rivet heads continue in excellent preservation, and the bottom presents a very smooth appearance, being merely covered with a dark thin slimy substance. It is, however, remarkable that grass has grown on the "pressure" part of the screw, on a portion of the rudder, and those parts of the bow and waterline where the composition seems to have been rubbed off, and that encouragement has been thus given to vegetation by the exposure of the under coating of red lead. To prevent a repetition of this evil, red lead will not be used now, but two coats of the composition will be applied, the under one direct against the bottom.

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

AUGUST, 1859.

LAKE LA GUARDA,—VERONA,—*and the Promontory of Sermione.*

This lake, known to the ancients by the name of Benacus, is the largest in Italy; it is thirty-three miles long from Riva in the North to Peschiera in the South, and one league broad in its upper (northern) part, two leagues between Torri and Maderno, and further South four leagues near the peninsula of Sermione. It lies N.E. and S.W., and is 328 feet above the Adriatic. Its depth in some places is above 160 fathoms, particularly between Gargnata and Casteletta. The principal stream which it receives is the Sarca, flowing into it from the North, and appearing again at Peschiera under the name of the Mincio. Numerous other streams appear to supply it, for its limpid waters, near the bottom, are cold in summer and warm in winter, even when the surface is nearly frozen. Its regular winds are the *Sobero* (North) and the *Ora* (South). It is exposed to strong winds, which occasionally very much disturb its surface.

This lake is celebrated for the enormous quantity of different kinds of fish which it contains, some of which are remarkable for their delicate flavour, while others are no less so on account of their size. The most important are: sardines, which in the spring and autumn frequent the southern shore in great numbers; salmon trout are the best fish in the lake; eels, pike, carp, tench, barbel, *ombres-chevaliers*, and especially young carp, which, it is said, are only found in this lake and that of Posta in the Abruzzes; the *tencolos*, which are rare; and another kind found on its extensive banks. Its shores also contain

several kinds of shells, distinguished by the variety of their colours. It affords an abundance of good fishing at all seasons, and thus supplies an important trade.

Numerous and thickly peopled towns and villages line the shores of Lake La Guarda, and afford safe and commodious ports, favourable to navigation, from whence results a flourishing trade. The principal of these ports is Desenzano, renowned for its *vino santo*, and from whence corn from Mantua and Brescia is exported to the Tyrol. The other most frequented ports are: Salo, with 5,000 inhabitants, several remarkable edifices, and situated in the midst of a country abounding in olive trees, oranges, lemons, mulberry trees, and vines; Tolosano, the inhabitants of which have a numerous variety of paper manufactures; Torri, Garde, Limone, Torbole, Peschiera, from whence fish is sent to Venice, Milan, and even to Genoa; the other ports are, Toscolana, Maderno, and Bardolino, which export manufactures of iron, lace, &c.

Among the beauties of Lake La Guarda are its terraced gardens on the borders of it, wherein the orange tree is cultivated. Amongst their ever green foliage are seen the white pillars of masonry supporting cross pieces of wood, which serve to support the roofs and fences beneath the shelter of which the trees are preserved from the effects of severe weather.

The Lake La Guarda, which is now one of the great channels of communication between Italy and the Tyrol, has been celebrated by Virgil and Catullus, as well as by several modern poets. Catullus lived on its shores, on the promontory of Sermione. Some ruins, which are still standing, are supposed to have formed part of his habitation.

On the subject before us we find in an interesting work published a few years ago, entitled "Sketches Descriptive of Italy," the following, including some account of Verona. Speaking of this place the author says,—

We found the whole city involved in confusion. A tremendous thunderstorm and water-spout had passed over about an hour before our arrival. Half the houses were inundated and the people were baling the water out of their doors as we passed through the streets. At the Albergo della due Torra matters were even worse, for the house had been struck, though not seriously injured, by the lightning and the servant of an English gentleman, who had got in just before the storm, had been thrown down by the shock, but fortunately not much hurt. Many hours afterwards we saw hailstones of a most uncommon size, which, from their excessive hardness, had not melted.

The situation of Verona is very fine, the ancient walls and towers sweeping across a hill surmounted by the gothic turrets of the castle, give it a noble appearance at a little distance, and the city itself is large and handsome, with the River Adige running through it, and watering the surrounding country, which is beautifully broken into

hill and dale. The fortifications were till lately very strong; having been repaired or rather indeed rebuilt by the Venetians—when Verona, in common with Eastern Lombardy, owned the sway of the republic: but they are now nearly in ruins, for they were destroyed by the French after the fruitless rising of the inhabitants against the government in 1797.

Verona is a city of very high antiquity, and, under its ancient Gaulic name of Brennia, was the scene of many important events. But its chief glory in these later days is the almost perfect interior of the Roman amphitheatre, which has been regularly repaired by the public spirited citizens, and even yet exhibits some resemblance to that ancient scene of barbarous amusement. The arena appears more circular than that of the Coliseum at Rome, or the uncovered, rather than recovered amphitheatre of Pompeii. The entrances and all the vomitories are perfect; but the seats are modern, and are supplied only as high as forty-five grades, for those of the upper story all round the building are gone, with the exception of one small fragment of the outer wall, which has four arches in length, and rises to the height of three stories, of which the upper range only overtops the present interior rows of seats. This exterior wall is built of large blocks of red marble (Veronese); and is of the Tuscan order. It was erected in the reign of Domitian; and the bad taste of the little ornament that remains does not give us a very high notion of the state of provincial workmanship in that age. The venerable appearance of the ruins is much injured on the exterior by shops and modern habitations with glass windows. The interior only has been preserved with care; and even there a little mean theatre has been permitted to be erected, apparently for the purpose of disfiguring it, as the trifling tax of twenty-five centimes, which it draws from those who wish to see the amphitheatre, can scarcely be accounted any object of profit. To have had the power of witnessing any dramatic entertainment for two pence halfpenny, however, is reward enough for the payment of the sum.

Among the less interesting Roman antiquities, the arch of Galienus, supposed to have been one of the gates of the city, is one of the most remarkable. It consists of two arches abreast, both very wide, and surmounted with small pediments, topped by arched windows.

The arch of Flavius, or the Foro Giudiziale, as it is variously termed, is a most interesting object. But long and difficult was our search after it, for a few only of our large party had any curiosity about it, and we who did go upon the quest left the lacquais de place with those who did not,—for we parted in the middle of the town, and they could not otherwise have found their way back to the inn. It was in vain we inquired after this ruin among all ranks and sexes, calling it by every name we could think of, and describing with as much minuteness as we could possibly do, a thing we had never seen; —no one seemed to know anything about it, nc one, either high or low, appeared aware of the existence of any such ruin: and it was rather by chance than direction we stumbled at last upon it. It is

indeed only a fragment of a building, and even this is converted into a private dwelling-house. One large arch, with an inscription, and some small broken twisted columns above it, are all that remain in front; but there is a Doric frieze in the interior which is of a very chaste design, and has been imitated by Palladio in the ornaments of the galleries or arcades near the modern theatre.

With the Ionic portico of the theatre itself, these galleries form three sides of a square; and in them the celebrated Marquis Maffei placed a vast number of ancient inscriptions, bassi relievos, and broken statues.

Verona has many collections of paintings and antiquities, and some museums of fossils. We visited several of these; and in particular that of Count Gozzola, where are some remarkably fine specimens of the petrified fish and plants of the neighbouring mountains. This is the second collection the Count has made, the first having been carried away by the French in consequence of its owner taking an active part in the insurrection of 1797. From the inscription which occupies a distinguished place in the present museum,—"Si *Cesare* mi approve, altro non chero," this loss, which he suffered in consequence of his exertions in its favour appears to have had no effect in weakening his attachment to the house of Austria.

The Saracenic bridge over the Adige is considered so frail, that foot passengers only are permitted to cross it. The pointed battlements which distinguished this style of architecture form a curious contrast to the Gothic tombs of the Scaligers,—where the profusion of highly decorated columns of pinnacles, niches, and ribbed arches, presents the richest miniature models of the later or florid era of that striking order. These tombs stand in a small enclosure in the public streets. They are six in number; and each has the bird and scaling ladder, the remarkable insignia of the Scaligers.

We were so hurried at Verona that we had scarcely time to visit any of its churches, and even omitted that which contains the reputed ashes of King Pepin. But with all our haste we did not forget that it was in fair Verona Shakespeare laid his scenes. And if we fancied we saw the "Two Gentlemen" in every pair of male passengers we encountered, still more did we remember that the "brawls" of the "Capulets and Montagues had disturbed the quiet" of these very streets we traversed; and among all the monuments which Verona contains, even those of warlike kings and knights, none was so interesting as that of Juliet.

"To us, Verona by that name was known."

Did it not possess an extensive claim on the notice of strangers, this tomb would certainly be mistaken for a common water trough; for it is formed of the coarsest red marble, and has no ornament whatever. If therefore it had any connexion with Juliet it was most probably her coffin. The garden in which it now stands occupies the site of a church belonging to an old monastery, which was destroyed by the explosion of a powder-mill moored in the neighbouring Adige. The

old woman who has the care of it tells the tale of Juliet's death, as it is related in the Italian novel from which Shakespeare drew the materials of his matchless drama. Every English visitor, she says, carries away a bit of the marble, a circumstance she greatly deplores, —not considering that her telling them all so, is the very way to effect the continuance of the custom.

In the afternoon of the 27th of June we left Verona. Our road now turned more westward. After traversing some miles of a beautiful and fertile country, with the mountains of Bassano stretching off to the right we descended to the Lago di Guarda and stopped at Peschiera,* a village and fortress built on its margin, at the precise spot where the Mincio, the native stream of Virgil, flows deep and clear from the lake. This village, under the name of Ardelia, was the scene of the celebrated interview between Attila and St. Leo.

Here we procured a crazy old boat and rowed to the promontory of Sermione. The lake was rough, and our leaky vessel soon became

* PESCHIERA AND MANTUA.—Peschiera is a small fortress seated on an island in the Mincio at its commencement from the Lake La Guarda. Under the Venetians it was simply a pentagon, to which the French during their occupation added three lunettes, forming a kind of crown work round a hill called Mundella, which commands the left bank of the river. These works have been strengthened by a covered way, which follows a natural dyke, and by which they are protected. On the left bank of the Mincio there is a large fort named Salvi, which protects the immediate approaches of the river. Since 1848 the fortifications have been carried by the Austrians beyond the island, and they have placed eight lunettes, similar to those of Mundella, on the neighbouring heights. These works form an intrenched camp capable of containing a large number of troops. Their great importance consists in menacing the flank of an army attempting to pass the Mincio near Goito or Valeggio. There is also the flotilla on Lake La Guarda, protected by the guns of Peschiera, which has well provided magazines, and this flotilla could soon transport a large number of troops to any part of the lake shore. There is also a system of sluices at Peschiera, by means of which the water of the lake may be kept in and at any moment opened again, so as to considerably increase the strength of the current in the Mincio, which would then be strong enough to carry away any pontoons placed on it by an enemy.

Mantua, like Peschiera, is also on an island in the Mincio, but far more important than the other, although it may have a surface of 124 acres. There is also another islet, called the Tencar, which is likewise covered with fortifications. They are both in the middle of the river, which is enlarged by them, and are 850 yards from the banks. The fortifications of Mantua would be insignificant without the natural defence afforded by the river. They may be attacked by drains made in the ground, as was attempted last century, but the only result obtained was the formation of a fetid mud more difficult to get clear of than the river itself. The military roads are defended by three forts: St. George to the East, and those of Radella and Pretoli to the West; the last being built by Napoleon I.

Mantua, which is always considerd the key of Italy, is too unhealthy and too far from the passes of the Alps, from whence supplies of all kinds are received, to be independent any time without them. And on these accounts it was that Verona was selected as the grand central depot of the Austrian forces.

half full of water,—which, combining with the cross influence of the wind and the weight of our numerous party, rendered its progress so slow, that I began to fear night and storms would overtake us before we reached Sermione, for the sky, which was threatening enough when we left Peschiera, every moment assumed a more portentous aspect. Delightful as it may seem to be tempest-tossed on the stormy Lake Benacus, I would willingly have relinquished this classic prospect for the comfort and safety of the neighbouring shore. But, as was usual in aquatic cases, my fears were out of all proportion to the reality of the danger, and deprived me of the enjoyment I should otherwise have had from the striking contrast of the Alpine scenery which closes round the head of this beautiful and extensive sheet of water and the flat fertile plain which forms its lower boundary.

It is from this part of its margin the promontory of Sermione stretches up the lake. At a distance it looks like an island, being connected with the shore only by a very low tongue of land. At all points it forms a beautiful feature in the scenery; and the more so the nearer we approach it, when the bold broken rock shaded with olives, which forms the extremity of the peninsula, rises more boldly from the water, and overtops the village and Gothic castle situated at its base. Our boat carried us among the picturesque walls of this decaying fortress and landed us below a shattered tower, which reminded me very strongly of the Eagle's tower in the castle of Caernarvon.

Though our voyage had been safe, it had been also slow. The sun was now setting, with every sign of an approaching storm, and we had a seven miles' course to retrace in a wretched old boat, so that we dared not linger so long on this beautiful spot or wander among the broken walls that are believed to mark the site of Catullus's rural retreat so leisurely as we could have wished. These remains lie principally on the verge of a cliff at the extremity of the promontory. Through the ruined arches the view up the lake appeared to so much advantage that, notwithstanding our haste, I contrived to sketch it while we were all engaged in recalling Virgil's description of the lake under an aspect not much dissimiler to its present one, and while a gentleman of the party repeated Catullus's account of his return hither, and an English translation he had made of it in the morning.

When we entered our boat we found the wind had died away. As we steered across the now placid lake, the surface, hushed into a deceitful calm, reflected the still glowing lights of the western sky, where the sun had sunk in stormy splendour, while the moon occasionally burst forth, pouring a long line of fitful radiance over the waters, and tinging the edges of the congregating clouds through which she was struggling with a silvery hue. All nature seemed hushed to silence. No movement but that of our own boat. No sounds saving those of our own oars broke on the stillness. It was that fearful calm which frequently precedes the bursting of a storm, when

"The waves scarce heave; the face of ocean sleeps,
And a dim horror saddens all the deeps."

The moon soon withdrew her light, and sheets, rather than flashes, of lightning broke from every part of the sky at the same moment, disclosing the fantastic forms of the clouds, which were now rapidly accumulating, and illuminating the whole surface of the water, which still retained its glassy calmness. Though we saw Lake Benacus in a storm, we did not see the lake stormy: but we were well content to resign the dangerous delight, and rejoiced to reach Peschiera just as the rain began to descend in torrents. During the whole night the lightning continued to pour in at every window on every side of the house in a flood of dazzling and incessant light, which taught us to think ourselves lucky even in the crowded shelter afforded us by the little inn, where we had agreed to pass the night, in order to enjoy to the last the society of the friends in whose company we had now travelled so long and so happily, and whose road here separated from ours. A spirit of good will does wonders. There it appeared to make room and to sweeten the oil and garlic of the nauseous repast, and it certainly did soften very hard couches; but it only increased the melancholy of the parting breakfast the next morning and the mutual adieus which succeeded it, as well as the sorrowful feelings which assailed us when, after seeing our friends off in the direction of the Tyrol, we bent our lonely course along the shores of the lake.

The morning was clear and beautiful after the storm, and the water shone bright in the early sunshine. We passed the promontory of Sermione on the landward side and stopped to rest the horses at Desenzano, a busy little town on the margin of the lake, with a port and a fortress, commanding a beautiful view of the upper part of the waters, where, suddenly narrowing at the point of Minerbo, three or four miles above Desenzano, they are gradually lost among the windings of the mountains between which they are enclosed.

Here we quitted the lake Benacus, and after ascending its steep banks traversed the Brescian plains, which are everywhere cultivated like a garden, varied by artificial irrigation and bounded to the North by a broken chain of hills containing several copper and iron mines and extensive quarries of that beautiful spotted marble for which this district is famed.

[We commend to our readers Arrowsmith's *Map of the Seat of War* for a clear display of the position of all the places mentioned in the despatches.—Ed.]

The French in Madagascar.—1642 *to* 1672.

Before describing the various reverses experienced by those companies which had establishments in Madagascar, or referring to the temporary existence of the unfortunate Fort Dauphin and the final drama of its establishment, let us take a rapid survey of the history of that island,—a temporary French possession, claimed by them for two centuries, never completely established, sometimes partially occupied, and for which France has so often shed her blood and wasted her treasure. Perhaps in the series of events that form that history some facts may be found sufficiently prominent by their influence on succeeding generations and the excitement which they produced to make a more lasting impression than others. Certainly there are enough of them to flatter the national vanity. But if it be true that the errors of the past may serve as lessons for the future, since history which tells of deeds that constitute a nation's glory, that depict the mind of a people, that proclaim the efforts and progress, the happy attempts to attain an advanced state of civilization,—why should history pass over in silence those fruitless efforts, those abortive attempts that do not tarnish this glory although they were aimed at contributing towards it;—and why should historians who have spoken of the maritime greatness of France in the seventeenth and eighteenth centuries seem to have forgotten that France ever occupied Madagascar, that she had governors and viceroys there and a supreme council, that she has contended there not only with man, but with wild nature in a fatal clime, in the face of deadly sickness, famine, and dissension.

Even if such facts have no useful purpose, their recital will at least be a tribute to the memory of the fallen,—those who have left behind them but a faint trace of themselves,—the hardy pioneers of civilization, who, in the midst of those unamiable passions inseparable from our nature, have at least displayed an indomitable energy seldom surpassed.

Whether Madagascar was known to Greek and Roman antiquity by the name of Memuthias or Cerné, as Flacourt considers, is of little importance, as his opinion is not sufficient proof of the fact. His archeological research is too much at fault for us to be satisfied with his assertions in such matters. One proof will be sufficient: the Arabic term Serendib, which he applies to Madagascar, is an Arabic word, when it had the name of Konvri and Kaledj according to Edrisi. However, although subsequent discoveries in astronomy have proved that Herodotus was right when he related, without believing it, that the Phœnicians sent by Necho, of the seventh century, from the Red Sea into the Mediterranean, to make the tour of Lybia, and when returning by the Pillars of Hercules had the sun on the right hand, it is certain that the ancients have not fixed precisely the position of Cape Prasuin; and that is so true that geographers (and among them the most learned, such as Strabo) have believed that the

coast of Africa joined that of India, and made the Indian Ocean a great interior sea.

The art of navigation, however, is not new in these seas, for, if we are to credit Eusebius, the descendants of Chus, the eldest of the sons of Ham, passed from Arabia to Ethiopia by the strait of Bab-el-Mandeb. From the time of Jacob, the Midianites and the Ishmaelites traded with the Egyptians, whom Euripides called the masters of the Greeks in the art of navigation. Sesostris, towards the year 1500 built a fleet of four hundred vessels for his expedition to the South. Philostratus relates that Eurytas or Edom, who was master of the Red Sea, prevented the Egyptian ships of war from navigating there. Scripture tells us that Solomon, after having taken the two ports of Eloth and Esiongeber, which belonged to Edom, sent his vessels from thence for gold to Ophir. In fact, it was under Darius that Syclan of Caryandre embarked at Caspatyre, on the Indus, for the Red Sea, and that he accomplished his coasting voyage in three months; and the discoveries of geography are ready to support the testimony of Herodotus.

All these facts, and more that we might quote, certainly do not prove that Madagascar was known to the Greeks and Romans; but it is difficult to imagine that in the midst of so great a maritime movement a land so extensive could remain unknown to a people who sailed round the Indian seas, when we frequently find in these days that small vessels in following the coast of Africa make this navigation by small steps, as Syclan had already done, the Phœnicians of Necho, the vessels of Solomon, and followed the wind and the currents on the coast of Madagascar.

At the end of the sixteenth century of our era, the Arab Hassan went and settled on the African coast a little to the North of Mombas. His children, tired of the wars which they had there, terminated them by abandoning the country to go to Komri, where they received the name of Antalaots, "People from beyond the sea." The Antalaots found there traces of former successive imigrations. Every year a flotilla of pirogues crossed the Mozambique Channel to the African coast and returned. The habits and language of their people denoted a different origin; in fact, the northern portion of the central part of the island was already occupied by that race of original Malays established there long before the year 1100, and which is now in possession of the whole island. The Hovas have taken their language there, and have given it the name of Malécassi, which Marco Polo has corrupted, and of which, according to the accounts of the Arabs, he has converted into Madagascar.

Marco Polo is the first European traveller who, in 1272, has spoken of Madagascar: not that he was there, but according to what he had been told, he also made of this island what it had long been, a land of wonders. Comerson, after saying that the natives have always received Europeans in a friendly way but have often cut their throats, seriously relates that a people half men and half beast dwell among the mountains called in the native language Kimosse. Legentil says

"it is likely that this traveller has only seen these creatures from a distance, who would not venture to show themselves. He should adopt the opinion of Flacourt, who says that there are neither giants nor pigmies at Madagascar. I am credibly informed that such tales are merely the jokes of Herravoon." The gravity of Legentil is no less amusing than the seriousness of Comerson.

Here is another wonderful tale, but for once no less true. Every one knows and has been amused by the stories of Sinbad the Sailor and his account of the Rock, the huge bird which he met with and which flew away with an ox. Well, Marco Polo, who is accused of dealing in the marvellous, speaks of it. It is true he also speaks of lions, giraffes, camels, elephants, and many other animals which no one has seen since. But Owen has not only seen the Rock, but an egg capable of containing it. Flacourt knows the Vorou Patra, which inhabits the mountains. Nevertheless, to perceive the existence of this merely fabulous animal, it is only necessary to refer to the Academy of Sciences, where there are three eggs, each containing very nearly two gallons, and about six times the size of the ostrich's egg. But as it is evident from the fragments of bones found with the eggs that the bird in question is not carnivorous, and consequently, in spite of its dimensions, it could not lift an ox, it was clear that the fragments found could not be those of the Rock; and M. Geoffrey St. Hilaire in a scientific paper gave them the pompous name of Epiornis, and considered them to be a modern discovery.

The spirit of enterprise which prevailed about the end of the fifteenth century incited Europeans to the discovery of unknown countries, and especially the Genoese, Spaniards, and the Portuguese. The French even did not remain inactive, for it was in the reign of Louis XII that Gonneville (a native of Normandy) accomplished a journey as remarkable as it is unknown, in which he, having been driven about by a long and severe storm, was wrecked on an unknown coast which he describes in glowing terms and calls Southern India. This might be Madagascar, for he was no doubt wrong in placing this land in 44° lat. Whatever it might have been, as the sea was covered by an infinite number of vessels, managed by as good sailors as Columbus, Diaz, or Magellan, this great island could not long remain unknown. At any rate it was only ten years after Vasco da Gama found the way to India by the Cape, fourteen years before Sebastian de Eleano first sailed round the world, that it was discovered, and nearly simultaneously by two navigators.

In 1506 Francis d'Almeyda, Count of Abrantes, was viceroy of India. His son Lawrence was the first who touched at Madagascar. This discovery remained unknown in Europe when a little later a fleet sailed from Portugal, on the 6th March, 1508, under the orders of Tristan d'Acunha, with Francis d'Albuquerque on board to protect the Christians at Socotra. The fleet was dispersed by a severe storm in passing the Cape, and one of the ships, commanded by Ruy Pereira, fell in with the coast of Madagascar about the Matatahas country on the 10th of August, St. Lawrence's day. He soon found the

coast of Mozambique and made known his discovery (a country rich in spices) to Tristan d'Acunha, and he very shortly anchored with all his ships in the bay of Concepcion, and the island was named St. Lawrence.

On the 29th January, 1642, Cardinal Richelieu, about a year before his death, desirous of promoting commerce and extending it to India in a regular manner, granted to Captain Rigault, of St. Maloes, the exclusive right of trade for ten years to Madagascar and the adjacent islands. This permission was confirmed on the 15th February following, which constituted the first East India Company, and divided into twenty-four parts or shares the profits to be derived by Rigault and his associates. And, finally, a patent, dated the 24th June following, contained, says an English historian, "everything that might be considered advantageous by a society which was under the protection of so powerful a minister."

After some delays, arising principally from want of funds, this company, formed under the auspices of Cardinal Richelieu, with Louis Berryer for director, and the father and uncle of the superintendent, Fouquet, as principals interested with Flacourt and others, determined to commence operations, and Captain Cocquet sailed in the *Saint Louis*, which he commanded, with the two-fold object of obtaining at Madagascar a cargo of ebony and establishing in the new colony the Sieurs Pronis and Fouquembourg to represent the company there, taking possession of the island in the name of his most Christian Majesty and laying the foundation of an establishment.

It was not until the month of November, and after having taken possession of the isle of Mascarenhas, that Pronis arrived at Madagascar, in the latitude of Antongil Bay. The *St. Louis* directed her course to the southward, following the shore of St. Mary and the Mangabi country, and came to an anchor in the bay between the little island of St. Lucia and the main island. Pronis landed in a place called Mangafia, followed by about a dozen companions and not more, and obtained from Dian Ramach, the King of the Carcanossi country, permission to establish himself. This was not effected without opposition from some Dieppe seamen who had been wrecked there and left on the coast by their Captain, Goubert, and who were trading on their own account, obtaining wax, skins, and other produce, which the country supplied in abundance. These men at once proved hostile and excited the country people of Anossi against the new comers; and it was not until presents were offered them by Ramach, abovementioned, and with his assistance that Pronis was enabled to do away this hostility, which had threatened to strangle his colony in its birth. In the mean time Captain Coquet obtained his cargo of ebony from the Matatanes country and Anossi.

In the month of May following, the *St. Lawrence*, commanded by Giles Rezimont, arrived at Mangafia with sixty new colonists, a third

of whom died from fever, but the rest formed a reinforcement to the colony. Pronis was thus enabled to commence operations. He sent twelve men to the Matatanes country; others among Antavares, on the borders of the Mananzari, one of the largest rivers of the country; two others were established at St. Mary, where Rezimont conducted them on his way to the North in search of his cargo; and, lastly, Fouquembourg himself went west, to the country of the Machicores, where he obtained supplies of provisions.

The Anossi country is one of the richest and most fertile in Madagascar, especially in the part about the valley of Amboule, which crosses the Manampari or Manantengha. It was there, a little to the southward of the mouth of the river Mangafia at the head of the bay of Itapoce, that Goubert had come to repair, and where Pronis had established the colony of St. Claire. Here an extensive plain afforded a rich pasture, sufficiently extensive for a large establishment. The Manampari from the mountains of the Ampaatres intersected its whole extent, but unfortunately the bay of St. Lucia afforded no security for ships, and the capital of the colony was shifted to the South extremity of the island, on the peninsula of Tolongar, which, by curving to the East, formed the safe shelter required by a harbour.

The foregoing events took place previous to the 17th of January, 1644, the day when Rezimont sailed from Fort Dauphin. He arrived in France on the 17th of June, with a cargo of ebony, and brought with him the news about the new colony. The sailors left by Goubert, a small number of colonists who had gone out with Pronis and Fouquembourg, and the French settled by Rezimont formed the nucleus of the settlement, which, although seated in a fertile valley, was not yet in a condition to provide for itself. The two years which followed the departure of Rezimont were devoted to visiting the Matatanes and the Antavares for the sake of obtaining provisions. Fouquembourg at one time obtained 500 head of cattle and a large quantity of rice. But this supply was insufficient, and forgotten by the capital the colony could not subsist. The company, in fact, failed in their means. All that they had was employed in freighting their ships, which transported a contingent of colonists and returned with a cargo of ebony. But the colony, without resources, without employment, and receiving no assistance, could with difficulty maintain itself. It fell into a state of languor which seemed likely to end in total ruin, and this crisis seemed to be imminent. In this state of things it was decided that Fouquembourg should go to France and declare the sad condition of the colony. He embarked in the *Ormeuil* and, arriving at St. Maloes in May, 1646, hastened to tell his story and give an account of his mission.

No sooner had he arranged to set out for Paris than he met with a man named Lièvre, who had just been selected to go out to Martinique in command of a detachment of a hundred men, who, suddenly changing his intention, proposed to accompany him to Paris. Fouquembourg without suspicion accepted the offer of his new friend, and they set out together on their journey. But in crossing the

forest of Dreux, Lièvre, who imagined that his companion had returned from India with plenty of gold, shot him and robbed him, hid his corpse in the bushes, and leading his horse to the border of the wood, met a boy, whom he desired to mount it, promising to reward him if he would follow him to Paris. He took a retired lodging in the Rue St. Martin, at the Hotel de la Croix-de-Fer, which was then only frequented by Germans and Flemings. After having examined the papers and effects of his victim he burnt them, disappointed at not having found what he expected, but satisfied that he had removed all traces of his crime. Notwithstanding this, a guard of the forest, who had heard the report of the pistol with which Fouquembourg had been shot, discovered the body. The judge of the adjacent village came and took down his statement, directing the body to be removed; but the judge of Dreux claimed it and a conflict of authority ensued; in consequence of which the king's advocate of Dreux went to Paris to obtain an arrest of process.

The advocate in passing the Rue St. Martin met the peasant whom Lièvre had employed to bring home the horse, who related to him all he knew about the transaction,—how he had come to Paris with a gentleman who had promised him money if he would follow him and keep silence. At that moment Lièvre passed by and the lad pointed him out to the advocate, who, being struck by the coincidence and suspecting the assassin, followed him to the Palais Royal, where he had gone to make some purchases. The advocate had just time to find an officer, who arrested him, and Lièvre at first conducted himself in a violent manner at being charged with crime. Nevertheless, he declared in the end that his pistol went off by accident, and that Fouquembourg was his friend; but after a useless attempt to evade justice he was executed at the Place de la Greve.

This event was most injurious to the colony, contributing much to aggravate its calamities. The noise which it made did not rouse the company from their apathy. The loss of papers, letters, accounts, and documents, which Pronis had sent home and which perhaps he regretted, formed an excuse for doing nothing, although no one was ignorant of the cause which had brought Fouquembourg home. Pronis therefore had good reason for complaining of the manner in which he was left. He had been reproached for not doing his best, and in justice to himself he should not have permitted the effects of the company to have been wasted. Again, it was by his severe exactions that he had incurred the hatred both of the colonists and natives,—that he increased instead of putting down, or at least endeavouring to allay, the dissensions which had appeared among the colonists themselves; and by his licentious proceedings that he seriously compromised the existence of the colony as well as his own.

It has been shown that the colonists could only obtain provisions under numerous difficulties. It was necessary to seek from a considerable distance, and at the risk of much danger to life, the rice and cattle necessary for the colonists, for they had adopted the bad system established by custom, and which had become attended with fatal

consequences, that of making forays among the natives—the neighbouring Matatanes, the Machicous, and others—to carry off cattle, rather than endeavouring by cultivating the ground about the fort to command always a supply of resources; but in this they failed in their foresight.

The colonists being compelled to reduce their means of subsistence whilst their crops were coming forward, found themselves in a straightened condition, and it became in consequence necessary to employ the utmost care in the use of provisions obtained in so dangerous a manner, and the strictest economy was enjoined. But this did not suit Pronis. He had formed a connection with a native female named Dian Ravel, and often sent her rice and meat obtained from the general stock at the fort. The colonists could not witness this without murmuring, but their observations only obtained from him threats of retaliation. The result was that a league was formed against him, headed by Beaumont and Jean Le Clerc; who, suddenly entering his house, carried him off a prisoner and placed the administration of government in the hands of Claude Leroi, who had succeeded Fouquembourg in his office when he left them.

(To be continued.)

TEMPERATURE OF THE SEA AROUND THE COASTS OF SCOTLAND IN 1857 AND 1858.—*By James Stark, M.D., F.R.S.E., &c., &c.*

(Continued from page 352).

Now, facts and theories must not be mixed up together; and in so far as I have been able to ascertain, no facts have been recorded, which prove that *a current* of Gulf Stream water, flowing to the N.E. or East, has been detected higher than North latitude 42°. Ture it is, that over the Great Newfoundland Bank, more especially during summer and autumn, when the Gulf Stream and Arctic current are largest, a kind of whirling motion is imparted, to what might be styled the Great Still Pool of waters, which lies over the great bank; and that warm water from the Gulf Stream may often be met with at this point, so high as North latitude 45° or 46°. Ships, therefore, sailing from Britain to America, when passing over that Bank, sail through heated waters for many miles; and if they sail South of the Bank, must sail over a loop of the Gulf Stream itself. Again, no facts known to me trace the heated waters of the Gulf Stream further East than West longitude 30°; and here they are only met with as heated water, spreading out without almost any perceptible current, or if a current at all can be traced, it is towards the S.E. or South, as if the waters were turning round and losing themselves in that Great Still Pool, the Sargasso Sea. True it is, that Franklin once met with surface water warmer than the surrounding ocean, in the bay of Biscay in 1776; and that General Sabine, in January, 1822, passed through

warm water when sailing between the parallels of latitude of Cape St. Vincent and Cape Cantin; but the very rarity with which such occurrences have been recorded, prove them to be the exceptional and not the normal case, and such occurrences will be presently explained.

After giving the most serious attention to the facts which have been ascertained, the following are my views of the course of the Arctic and Gulf Stream currents:—

Two opposing currents meet at the Newfoundland Banks—the Great Arctic Current and the Great Stream. The Great Arctic Current flows southwards, along the East coast of Greenland, and having passed its southern point, meets, and unites with, another broad current, which comes down from Davis and Hudson Straits. A small branch of this current flows between Newfoundland and the Labrador coast, through the gulf of St. Lawrence. Another portion of this current, deflected to the S.W. by the Great Bank of Newfoundland, washes the eastern and southern shores of Newfoundland, and the south-eastern shores of Nova Scotia, and may be traced down the American coast nearly as far as Cape Hatteras. By far the greater portion of this current, however, passes to the East of the Great Bank of Newfoundland, overflowing, however, that bank.

These various portions of the Great Arctic Current encounter the Gulf Stream near the southern margin of the Great Bank; and, as the cold waters on that bank are comparatively at rest, the icebergs ground here, and, on melting, deposit the rocks and debris they have brought down with them from the Arctic regions, and thus continue to enlarge these banks.

The Gulf Stream, after encountering the Arctic Current, is no longer able to retain its eastward direction; but, in obedience to the law which regulates the meeting of currents from opposite directions, takes a mean course, proportioned to the velocities and breadths of the two currents which meet. The Gulf Stream is, therefore, deflected gradually more and more to the S.E. and South; so that its upper margin describes a kind of circle round Corvo and Flores, the most western of the Azores. Here all traces of the Gulf Stream are lost in that immense pool or seaweed bed, the Sargasso or Grassy Sea, which exists in the centre of the Atlantic.

To carry out Mr. Maury's theory, and that of those who, with him, trace the Gulf Stream continuously to the shores of Britain, it is necessary to prove that, when the two streams meet, the difference in the densities of the water is such, that the waters of the Arctic current, in consequence of their greater specific gravity, shall sink to the bottom, and allow the Gulf Stream waters to flow over them in consequence of their lesser specific gravity. The facts, however, so far as yet investigated, are entirely opposed to this view; and even Mr. Maury's statement of facts on this point, is entirely opposed to his theory. Thus, he states, that the "waters of the Gulf Stream are salter than the waters of the sea through which they flow;" and, in another passage, he states, that the waters of the North Sea "are lighter than those of the Mexican Gulf." The experiments of Thomassy confirm

this statement; for he found that the waters of the Gulf Stream off Charlestown, contained one-eighth part more salt than did the waters of the Bay of Biscay. But the fact is, that the waters of the Arctic current, instead of containing their due proportion of salt, are fresher than those of the ocean, so long as ice is melting in the polar regions, so that their density or specific gravity is less than that of the waters of the Gulf Stream. The waters of the Gulf Stream, on the other hand, from the great evaporations from their surface, are known to be much salter and denser than those of the general ocean; so that, when these two currents meet, notwithstandig that the density of the Arctic Current is somewhat increased by its lower temperature, its absolute density is not so great as that of the warm saline waters of the Gulf Stream. The waters of the Gulf Stream, therefore, though higher in temperature, are of greater specific gravity than those of the Arctic Current, which they encounter, and, therefore, cannot flow over that current. If the Gulf Stream, therefore, crossed the Arctic current at all, seeing it is of greater specific gravity, it must pass it as an under-current. It is universally agreed, however, that these two currents do not commingle their waters, so long as either current can be traced; so that it is gratuitous assumption to hold that, notwithstanding these facts, and the known laws of nature with regard to the meeting of currents, the Gulf Stream crosses the Arctic Current, and flows onwards towards Britain and the arctic seas.

But Mr. Maury endeavours to get over part of this difficulty, by assuming that the Arctic Current is split by the Gulf Stream (by what agency he does not venture to state) into two parts, one of which dips under the Gulf Stream; while the other, taking a S.W. direction, flows down the side of the Gulf Stream, along the shores of Nova Scotia and the United States. This assumption appears to be made for the purpose of bearing out his theory, that currents of water from the North must assume a course to the West, in consequence of the rotation of the earth on its axis; while currents from the South must assume a course to the East. Every fact known regarding the course of the currents in the North Atlantic Ocean, disproves the truth of Mr. Maury's assumption. The great mass of the Arctic current, by virtue of the known configuration of the straits and coasts down which it runs, is thrown to the *East* of the Great Newfoundland Banks; and the icebergs, which are floated down with it, though a great many are grounded on the banks, are often met with hundreds of miles to the East of these banks, and still floating in the cold waters of the Arctic current. It is quite true, as has been already stated, that one small portion of the Arctic Current takes the course assigned to it by Mr. Maury. But the great mass of the current takes the opposite direction, and runs to the eastward towards the western shores of Europe and Africa. The idea, therefore, of the supposed rotation of the earth on its axis having anything to do with the course of the Atlantic Currents, is, to say the least, still unproved.

Besides, is it not a known fact that every ship now avoids as much as possible getting into the waters of the Gulf Stream, both because

storms are more frequent over its course, and also because, in consequence of its containing such a much larger quantity of salt, combined with its high temperature, it has a corrosive action on the ship's copper, as ascertained by inquiries, made for a period of ten years, by the Secretary of the United States Navy. Yet, according to Mr. Maury's theory, and that of those who hold with him that the Gulf Stream flows northwards, every ship leaving Britain for America would be sailing in these corrosive waters until she landed at Halifax or New York; whereas, we know for a fact, that unless it be when passing to the South of the Great Bank of Newfoundland, where they cross a small portion of its upper arc or bend, vessels in their passage from Great Britain to Halifax and New York never touch the heated waters of the Gulf Stream. All the ships' logs which give the temperature of the sea, exhibit a gradual increase of temperature as they sail from this into lower latitudes. In the voyage to America, so long as they sail in nearly the same latitude, the temperature of the sea is pretty uniform till they approach the Banks of Newfoundland, when, if icebergs be present in any quantity, the temperature of the water is found to be considerably lower. If, however, the ship is sailing to New York, and passes South of the Great Bank, it suddenly passes from this cold water into the hot waters of the Gulf Stream, and this increased temperature is met with so long as the ship is sailing through the loop or bend of the Gulf Stream met with at this point, and shown in the accompanying chart. It is, in fact, the passing of the vessel through this loop or bend of hot water which has given rise to the notion that a branch of the Gulf Stream flows northwards.

The Arctic Current, after encountering the Gulf Stream, instead of its southern or south-south-eastern direction, is, by virtue of the known laws regarding the meeting of currents, forced to assume a course more to the East; so that if a line were drawn from Cape Chudleigh, in Labrador, to the Straits of Gibraltar, it would represent in a general way, the direction of the current. Like the oceanic currents, however, when not confined by other currents, or by the peculiar configuration of the land through or over which they pass, this current spreads out considerably as it approaches the western shores of Europe and Africa, so that its northern margin is met with many miles to the North of Cape Finisterre, in Spain. I suspect it is this current to which mariners have given the name of the *Western Drift* Current—that current which retards the voyage to America, but quickens that to Britain.

The northern margin then of this Arctic Current, as it crosses the Atlantic, follows very closely the line of the southern edge of that great elevated Telegraphic Plateau, which has a general direction from the Banks of Newfoundland to Ireland. It is part of this northern portion of the Arctic Current which enters the South of the Bay of Biscay on the North of Spain, and, washing round the coasts of Spain and of France, gives rise to that current so well known as Rennell's Current, which, washing round the Bay of Biscay, crosses the mouth of the English Channel, and sends a stream up both sides

of Ireland, and continues its course to Norway and the Northern Arctic Seas. It is this great current flowing round the Bay of Biscay which gives to that sea its restless turbulence. Blow the wind from what quarter it may, it meets with a current opposed to it, and hence raises those waves so much dreaded by the mariner; and the continuance of the current across the mouth of the English Channel is the cause of numerous wrecks in stormy weather, by carrying vessels against the Scilly Isles.

It is a known fact that, along the Portuguese coast, there is a current, part of which flows northward, part southward. This is part of the Arctic Current, which, as it encounters the shores of Portugal, is deflected either to the North or South, by the peculiar configuration of the coast. For instance, Lord Gifford, in 1856, found this current, even so far South as the latitude of Oporto, setting northwards, but from this point the direction of the current was to the South.

It is a well known fact that, from opposite Cape St. Vincent, in Portugal, to nearly opposite Cape Cantin, in Africa, and on to at least 25° West longitude, the whole Atlantic has a slow movement to the East, so that a current from the Atlantic flows through that strait at the rate of about two or three miles an hour. Admiral Smyth, in his recent work on the Mediterranean, mentions the fact, that the mean temperature of the waters of the Mediterranean "average about 3·5° Fahrenheit more heat than those of the western part of the Atlantic Ocean;" and that around the coast of Sicily the waters of the Mediterranean are "from 10° to 12° warmer than the water is stated to be outside the Strait of Gibraltar." Lord Gifford, who visited the Mediterranean in his yacht the *Fair Rosamond*, during the winter 1856–7, in the interesting Meteorological Register which he has published, confirms to the full the statements of Admiral Smyth. For instance, he found, from a three-hourly register, that the temperature of the current flowing through the Strait of Gibraltar, on the 8th November, was 61·3°, and off Gibraltar 61·4°; whereas, as soon as he got rid of the current, and sailed over the waters proper of the Mediterranean, their temperature averaged 64°, though a fortnight later in the year.

From the observations which Admiral Smyth has published, though they are by no means complete on this point, it would appear that the density of the surface water entering the Mediterranean Sea from the Atlantic is less than that of the general waters of the ocean; all which facts go to prove that the current which sets through the Strait of Gibraltar, to supply in part what is lost by evaporation from its surface, is part of the Arctic Current, which is both colder and fresher than the general waters of the ocean,—colder, because coming from the Arctic regions; fresher, because diluted with the melted water from the ice. If this current, however, had been supplied by the Gulf Stream, as the ordinary Gulf Stream theories necessitate, it ought to have been both warmer and salter than the general waters of the ocean, and than those of the Mediterranean.

From opposite Cape Cantin, in Africa, to Cape Blanco, and out to

sea at least as far West as Madeira, a cold current is met with, having a strong easterly, or, more properly speaking, a south-easterly, set towards the western shores of Africa. This is part of the Arctic Current, which, having deflected the Gulf Stream, is now rushing towards the western coasts of Africa; and its low temperature—from 6° to 10° Fahrenheit, according to the period of the year, lower than that of the surrounding ocean—and south-easterly set, clearly point it out to be the Arctic Current, which had crossed the Atlantic from the Banks of Newfoundland. This current is well known to, and is greatly dreaded by, mariners, as it carries them to the East, out of their reckoning, and throws them on the dangerous African coast.

The further course of this current it is unnecessary to trace, farther than to say that the peculiar configuration of the African coast causes a considerable portion of this current to be deflected from the African shores, so that it sweeps through and to the South of the Cape de Verd Islands, round the southern portion of the Great Grassy Sea, and joins or accompanies the Equatorial Current in its course to the N.W. The other portion of the current continues its course down the African coast to form the Guinea Current.

Let us return, therefore, to the Gulf Stream. Mr. Maury tells us that this stream originates in the Gulf of Mexico, and, as it issues from the Straits of Bemini, takes the nearest and shortest course it can for the British Islands. If, however, this stream assumed a given direction, either because that direction was given to it by the supposed effect of the rotation of the earth on its axis, or in consequence of a *vis a tergo* in the Gulf of Mexico, then the moment it issued from that gulf, it ought either to flow along the northern shores of Cuba and St. Domingo, or cross the Grassy Sea in a straight line for Cape Blanco, in Africa. By neither theory could it pursue the course it is known to take. Instead of this, however, the Gulf Stream, on its leaving the gulf, *turns back on itself*, bending round the peninsula of Florida, and following the hollow curved line of coast which Florida, Georgia, and the two Carolinas present. This fact is of itself quite fatal to Mr. Maury's theory of the causes of the course of the Gulf Stream. Were its course influenced or caused by the rotation of the earth on its axis, as the stream issues from the gulf with a due easterly set, it would seek the direct route to Cape Blanco, in Africa. On the other hand, had it even a north-easterly set when it issued from the gulf, the rotation of the earth, according to Mr. Maury's theory, would increase its easting, so that instead of passing, as it does, far to the North of Bermuda, and entirely clear of it, it would pass it far to the South.

Were no counter agent at work, the Gulf Stream, as it issues from the Gulf of Mexico, would, from the peculiar configuration of the land, and from its leaving the gulf with a current flowing due East, or, rather, S.E.b.E., wash the northern shores of St. Domingo and Cuba. There must, therefore, be some powerful agency at work to cause the Gulf Stream to *round* the point of Florida, and bending back on itself to the extent of nearly half a circle, force it round the

hollowed coasts of Florida and Georgia. No one can look at the map without seeing that that agent is the Equatorial Current, which, uniting with no small portion of the North African Current, sends the much greater portion of its waters to the northward of Porto Rico, St. Domingo, and Cuba. This large and powerful current, meeting the much smaller current which issues from the Gulf of Mexico, forces it back on the hollow coasts of Florida,—indeed, there can be no doubt that this, or an analogous current, has been the agent which hollowed out these shores. The Gulf Stream, therefore, follows the line of that coast, and it is unquestionably the line of that coast which imparts to the Gulf Stream its easterly direction. As to the rotation of the earth on its axis having anything to do with the direction of that current, or of any of the other currents in the North Atlantic, I am quite sceptical, and have not, as yet, met with any fact which lends countenance to such a theory.

If the views now given of the currents in the Atlantic be accepted, how, it may be asked, do they accord with the known facts regarding West India seeds, and wrecks of vessels on the American shores, being stranded on the western shores of Ireland, Scotland, and Norway, or with the tracks of bottles thrown into the Atlantic?

Let us first take Captain Becher's Bottle Chart (not Admiral Beechey's, as Mr. Maury styles it), and see whether Mr. Maury's theory of the course of the Gulf Stream, or the views just propounded of the currents in the Atlantic, will best account for the track which bottles have taken when thrown into different parts of the Atlantic Ocean.

A bottle was thrown from the *Hecla* in Davis Straits, in lat. 53° 13′, and was thrown ashore at Tenerife. By the usual Gulf Stream theory, that bottle must not only have travelled against the current, but also against the prevalent winds, for thousands of miles. By my theory, it floated along with, and in, the Arctic Current, which naturally landed it at Tenerife, as it happened to be in that part of the current which flowed past that island.

A bottle was thrown out in North lat. 46°, West long. 34°, that is, somewhat to the East of the Newfoundland Bank, and was landed on Porto Rico, one of the West India Islands. By the Gulf Stream theory, that bottle ought to have landed in Norway or the North of Britain. By my theory it was thrown out in the Arctic Current, was with it carried round by the coast of Africa, and joining the Equatorial Current off, or to the South of, the Cape de Verd Islands, was naturally landed at Porto Rico.

Several bottles thrown out in Davis Straits were stranded at the West coast of Ireland. All such bottles, by the Gulf Stream theory, should have passed Great Britain, and been carried to Norway or the Arctic Ocean.

Many bottles were thrown out over or near the Great Newfoundland Banks. One of these was stranded at Andros Island, one of the Bahama Group. Another was stranded at Cape Finisterre, in Spain. One was carried to the West coast of Ireland, but the most of them were stranded at the Scilly Isles and West coast of England. In fact,

all were carried by the Arctic Current, as I have described it, whereas by the Gulf Stream theory the one carried to the Bahamas must have been going against wind and current in its whole course; while by that theory, all the other bottles ought to have been carried past Britain, as all were on the North side of the assumed northward course of the Gulf Stream.

A bottle was thrown into the sea off Cape Sable, in Nova Scotia, and was picked up at Fuerte Ventura, one of the Canary Islands. By the usual Gulf Stream theory, that bottle must have crossed the whole breadth of the Gulf Stream, and gone against the prevalent winds for thousands of miles. By my theory, it was carried by the northern margin of the Gulf Stream, till that stream was deflected South by the Arctic Current, and being then borne onwards by that current on its southern margin, was naturally deposited at the Canaries.

Bottles thrown out between latitudes 45° and 50° North, and so far West as West longitude 25°, were almost all stranded on the North coast of Spain, on the French coast, or on the western shores of England and Ireland. A very few only reached Scotland. By the usual Gulf Stream theory, most of these ought to have been carried past Britain; but if the currents flow as I have endeavoured to show they do, then they were stranded at the very places where they might, *à priori*, have been expected to be cast ashore.

In a word, this valuable chart is the strongest possible confirmation of the truth of the theory of the currents now proposed, but records many facts quite irreconcilable with Mr. Maury's on the usual theories, which hold that the Gulf Stream flows N.E. to the Arctic Ocean. This bottle chart also appears to me conclusively to prove that it is the conjoined current from the African coast and the Equatorial Current, flowing to the North of St. Domingo and Cuba, which forces back the Gulf Stream on the curved coasts of Florida.

But this valuable chart proves much more than the direction of the currents in the ocean. It proves also that floating bodies are amenable to the prevalent winds which blow. It was stated above, that during the winter months more especially, the prevalent winds over the whole Sargasso Sea, are the S.W. or anti-trade winds. This valuable chart then shows that several bottles thrown out even in the middle of that mass of still water, where it is universally acknowledged there are no currents, were thrown ashore at places bearing nearly due N.E. from the spot where they were thrown out; thus clearly proving that they had been carried by the wind alone. Thus, one of these bottles was stranded at St. Miguel, one of the Azores; another at Flores, another of the Azores, while others were blown also in the direct line of the S.W. wind, and stranded on the shores of Ireland or England. As all these bottles were thrown into the sea at places where all acknowledge there is no current whatever, they illustrate the effect of the prevalent wind on floating bodies, and show how a prevalent wind may even drive floating bodies against or across a current. It is this S.W. wind which appears to be a main agent in driving West India

seeds and floating pieces of wreck to our western shores, after they have been carried so far on their way by the Gulf Stream or other currents. But the influence of the wind in impelling a floating body in its direction was never better illustrated than in the case of a bottle thrown out into the Gulf Stream in the latitude of Charlestown. This bottle, instead of being borne along with that stream, was stranded at Bermuda, which is to the West and South of that stream, and quite clear of its waters.

(To be continued.)

Historical Sketch of Eruptions of the Volcano of Mauna Loa, Hawaii.

(Concluded from p. 363.)

The Eruption of January 23rd, 1859.

In grandeur and beauty, no eruption within the memory of men now living, can compare with the present, which broke out on the afternoon of Sunday the 23rd of January. It differed from most previous ones in its beautiful fountain-like ejection of the lava from the crater, to a height varying continually from 200 to 500 feet. It is seldom that eruptions occur, combining an extensive flow of lava with such a lofty spouting. That of 1852 is the only previous one we remember. This fountain continued from the 23rd of January till the 7th of February, when the spouting ceased, but the large flow of lava has continued to run in a great many streams up to our latest advices from that island, which was about the 20th of March. At that date there appeared to be no cessation in it.

The commencement of this great eruption is described by the Rev. Mr. Lyons, of Waimea, Hawaii, in a letter to us dated February 4th. Mr. Lyons' dwelling was in full view of the crater from its commencement, and seated in his verandah, so bright was the light of the eruption that he could read a newspaper without difficulty, and during its height candles were unnecessary in the evenings. This will give to our readers abroad some idea of the splendour of the scene. Mr. L. says:—

"Had I the ability I should like to give a description of the present volcanic eruption; but I am fearful of a failure should the attempt be made. When one has seen the real thing itself, there is no room for the play of the imagination or poetry. You may exhaust language of its most impressive and descriptive terms, and yet fail to reach the reality. I shall attempt no more than to give a few facts.

On Sabbath, January 23rd, volcanic smoke was seen gathering on Mauna Loa. In the evening the mountain presented a grand, yet

fearful, spectacle. Two streams of fire were issuing from two different sources, and flowing, apparently, in two different directions. The whole region, earth and heaven, were lighted up, and even the interior of our houses received the lurid volcanic light direct from its source.

In the morning of the second day, we could discern where the eruptions were. One appeared to be very near the top of the mountain, but its stream and smoke soon disappeared. The other was on the North side, further below the top, and was sending out its fires in a North-westerly direction. On the second and third nights, the dense smoke and clouds prevented us from having a fair view of Pele's doings; but on the four following nights we had a view,—and such a scene! It seemed as though the eye could never weary in gazing at it. The burning crater seemed to be constantly enlarging and throwing up its volumes of liquid fire above the mouth of the crater—I will not venture to say how high,—and the fiery stream rolled onward and onward, still adding grandeur and terror as it proceeded, till on the morning of the 31st, about sunrise, the stream was compelled, though reluctantly, to stop, by meeting the waters of the ocean. Even then its resistless and opposing energy carried it on some distance into the sea."

Immediately after the fact of a new volcanic eruption was known in Honolulu, the publisher of this paper left by the first packet for the scene, and from the following account of his visit, which appeared in the *Advertiser* of the 17th of February, we copy the following:—

"Our camping ground is located on the elevated table land lying between the three great mountains of Hualalai, Mauna Kea, and Mauna Loa, sixteen miles from Kailua, and some ten miles in an air line from the crater, which lies over against us on the side of Mauna Loa, distinctly in view. This plain is some 5,000 feet above the sea, and is covered with small shrubs and trees, growing from ten to twenty feet high. In some places it is level and covered with a coarse black sand, similar to that found on the sides of the Punch Bowl, only much coarser, while the shrubs are so sparse as to allow a horse to travel across it on a full gallop. In others it consists of a dense jungle with numerous pits or caves, concealed by overgrowing shrubs. This part of the plain is almost impenetrable. In still other localities it is covered with coarse lava stones or clinkers, over which travelling is next to impossible. The nights are extremely cold, frost covering the ground every morning. The days are, however, warm and pleasant, and the air, both night and day, is cool and invigorating.

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

around. As night advanced, and every little stream and light became more and more distinct, the scene was grand.

This new crater is located on the northern slope of Mauna Loa, at an elevation of, say 8,500 feet above the sea. It is some ten or more miles westward and about 4,000 feet lower than the last eruption of 1855, known as that of Mokuaweoweo. The course of the stream, from its source to the sea, we judge to be nearly N.W.b.N. The crater bears due East from Kailua by the compass, and is about twenty-four miles from the harbour in a straight line. Its latitude, as near as we are able to determine without instruments, is 16° 37′, long. 155° 49′. By referring to a map or chart, its position on the island can readily be noted. Our figures are only estimates, and accurate observations may prove that we are in error in some of them.

The actual size and form of the crater can only be determined by visiting its immediate vicinity, which we were not prepared to do. From the distance at which we observed it, about ten miles, and from various points of observation, it *appeared* to be circular, its width being about equal to its breadth, and perhaps 200 feet across the mouth. This may be too moderate an estimate, and it may prove to be 300 or even 400 feet across it. The rim of the crater is surrounded or made up of cones formed from the stones and scoria thrown out, these cones constantly varying in extent, now growing in size and again all tumbling down. The lava does not simply run out from the side of the crater like water from the side of a bowl, but is thrown up in continuous columns, very much like the Geyser springs, as represented in school geographies.

A dense heavy column of smoke continually rose out from the crater, but always on the North side, and took a North-easterly direction, rising in one continuous column far above the mountain, to a height of perhaps 10,000 feet above the crater. This smoke hovers over that island, and indeed all the islands, and must at times, when the Trade wind lulls, obstruct the view. During our stay, however, it passed off from the mountain, leaving the lower atmosphere quite clear. We watched closely to observe whether any steam could be seen issuing, either from the crater or from any of the streams of lava, but could not see anything that could be called steam or vapour, unless occasionally very slight indications along some of the lava streams. Considerable smoke rose along the stream, as the molten lava came in contact with trees and vegetable masses, but the mass of smoke came from the crater itself. Steam was noticed in various places on the plain, issuing from the rocks, and near one of the camps the heat was so intense that a teakettle could be boiled over it. But this steam was undoubtedly caused by the heat of the flowing lava, which was about a mile distant, coming in contact with pools of water in caves or pits.

At times the spouting appeared to be feeble, rising but little above the rim of the crater, but generally, as if eager to escape from the pent-up bowels of the earth, it rose to a height nearly equal to the base of the crater. But the columns and masses of lava thrown out

were ever varying in form and height. Sometimes, when very active, a spire or cone of lava would shoot up like a rocket or in the form of a huge pyramid to a height nearly double the base of the crater. The mouth of the crater being about 250 feet across, the perpendicular column must be 500 feet in height! Then, by watching with a spyglass, the columns could be seen to diverge and fall in all manner of shapes, like a beautiful fountain.

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

On leaving the crater, the lava stream does not appear for some distance, say an eighth of a mile, as it has cut its way through a deep ravine or gulch, 80 or 100 feet deep, which hides it from the eye. The first then that we see of the lava after being thrown up in the crater, is its branching out streams some distance below the fountain head. Instead of running in one large stream, it divides into a great number—perhaps as many as fifty—spreading out over a tract of five or six miles in width. For the first six miles from the crater, the descent is very rapid, and the flow of the lava varies from four to five miles an hour. But after it reaches the plain, where it is level, it moves slower. Here the streams are not so numerous as higher up, there being a principal one, which varies and is very tortuous,—from an eighth to a quarter of a mile in width, with frequent branches running off from it.

Some of the finest scenes of the flow were the cascades or falls formed in the stream as it flowed down the steep declivities below the crater, and before it reached the plain. There were several of them, and they appeared to be changing and new ones formed in different localities as new streams were made. One, however, which appeared without change for two days, was 80 to 100 feet in height. First, there was a fall, then below were cascades or rapids. To watch this fall during the night, when the bright cherry-red stream of lava was tumbling over it at the rate of ten miles an hour, like water, was a scene not often witnessed. and never to be forgotten. In fact, the lava near its source had all the characteristics of a river of water flowing rapidly along, and gurgling with cascades, rapids, currents, and falls.

On reaching the plain, where it is more level, the lava stream of

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

On the afternoon of our arrival at the camping ground, a new stream started some few miles below the crater, which had evidently been dammed up by some obstruction, and came rushing down with tremendous noise and fury through the thick jungle which lay in its track, burning the cracking trees, and sending up a thick smoke almost as dense as that from the crater. This stream, from the time it broke away from the embankment, moved along two miles an hour till it reached the vicinity of our camp, when its progress was checked, and it moved not more than a quarter of a mile an hour. But it formed a magnificent sight. Here was a stream of lava rolling over the plain, twenty to twenty-five feet in height, and an eighth of a mile in width, though its width varied a great deal, sometimes broader, sometimes narrower. It was, in fact, a mass or pile of red-hot stones, resembling a pile of coals of fire, borne along by the more liquid lava underneath. As it moved slowly along, large red boulders would roll down the sides, breaking into a thousand small stones, crushing and burning the trees, melting the rocks, and destroying everything which lay in the track. It is impossible to give a true conception of the immense force and power of this lava stream, bearing along as it does an almost inconceivable mass. It reminds us most vividly of the breaking up of the ice in a large river, only the imagination must stretch the comparison and suppose the ice piled up twenty-five feet, and thus borne along by the current beneath, the whole width of the river moving at the same time, crashing and breaking and piling up cones and irregular masses on top. But even this comparison is far below the reality. To be conceived it must be seen.

We visited the lava stream four or five times, both in the day and night. In the daytime, however, it appeared robbed of its peculiar beauty. Owing to the intense heat it could not be approached comfortably within a hundred feet, yet some of our party, anxious to outdo the rest, ventured to the stream itself, and with long sticks raked out small specimens of red-hot lava stones, which we brought away as mementoes. This stream is made up for the most part of the dross of the lava, called *aa*, which as it becomes cooled crumbles into stones and rocks, and is thus piled up to a height of twenty or twenty-five feet, and carried along by the more liquid lava beneath it. This dross lava, when moving along, is of a dark reddish colour and almost as heavy as iron; while the purer lava, called *pahoehoe*, is of a more brilliant cherry hue, and when it cools, becomes very porous and lighter than *aa*. It also forms the best specimens.

About three o'clock a.m. we started to visit the new stream which had been rushing down during the night, and was glowing with intense heat. It moved slowly over the plain within fifteen minutes' walk of our camp. On reaching it we stood by a small tree 100 feet distant, and as it advanced were forced to retreat before it. In fifteen minutes the tree was reached, burned, and the spot where we were covered by the irresistible stream. Once, while standing on a rock with several others, perhaps two hundred feet from the stream, a loud ringing noise was heard as if the rock had been struck by an immense sledge hammer. We started, not knowing but Pele herself was under and after us, but soon found our alarm groundless, though the noise was probably caused by the liquid lava running underground and suddenly filling up a cave beneath. A little while after, a singular scene presented itself,—the appearance of a man sitting on a rock and riding along on the top of the fiery lava stream. So deceptive was the illusion that several of the party, when it was first observed, looked around to see if one of their number had not by accident got on to the stream. The lifelike image moved slowly along, till suddenly his head tumbled off, and the whole soon disappeared.

The tract over which the lava is now flowing is a barren waste, uninhabited, except by wild hogs. Formerly wild cattle roamed over it, but they have been driven to the side of Mauna Kea, which furnishes better food. We are not aware that any valuable land has been overrun, except it be near the village of Wainanalii, where the stream entered the sea.

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

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

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

"When the torrent of fire precipitated itself into the ocean, the scene assumed a character of terrific and indescribable grandeur. The magnificence of destruction was never more perceptibly displayed than when these antagonistic elements met in deadly strife. The mightiest of earth's magazines of fire poured forth its burning billows to meet the mightiest of oceans. For two-score miles it came rolling, tumbling, swelling forward, an awful agent of death. Rocks melted like wax in its path; forests crackled and blazed before its fervent heat; the very hills were lifted from their primeval beds, and sank beneath its tide, or were borne onwards by its waves: the works of man were to it but as a scroll in the flames. Nature shrivelled and trembled before the irresistible flow. Imagine Niagara's stream, above the brink of the falls, with its dashing, whirling waves madly raging, and hurrying on to their plunge, instantaneously converted into fire, a gory-hued river of fused minerals; the wrecks of creative matter blazing and disappearing beneath its surface; volumes of hissing steam arising; smoke curling upwards from ten thousand vents, which give utterance to as many deep-toned mutterings, and sullen, confined, and ominous clamourings, as if the spirits of fallen demons were struggling against their final doom; gases detonating and shrieking as they burst from their hot prison-house; the heavens lurid with flame; the atmosphere dark, turgid, and oppressive; the horizon murky with vapours, and gleaming with the reflected contest; while cave and hollow, as the hot air swept along their heated walls, threw back the unearthly sounds, in a myriad of prolonged echoes. Such was the scene as the fiery cataract, leaping a precipice of fifty feet, poured its flood upon the ocean. The old line of coast, a mass of compact indurated lava, whitened, cracked, and fell. The waters recoiled, and sent forth a tempest of spray: they foamed and lashed around and over the melted rock; they boiled with the heat, and the roar of conflicting agencies grew fiercer and louder. The reports of the exploding gases were distinctly heard twenty-five miles distant. They were likened to discharges of whole broadsides of heavy artillery. Streaks of the intensest light glanced like lightning in all directions; the outskirts of the burning lava as it fell, cooled by the shock, was shivered into millions of fragments, and, borne aloft by strong breezes blowing towards the land, were scattered in scintillant showers far into the country. For three successive weeks the volcano disgorged an uninterrupted burning tide, with scarcely any diminution, into the ocean. On either side, for twenty miles, the sea became heated, and with such rapidity, that on the second day of the junction fishes came ashore dead in great numbers at Keaau, fifteen miles distant. Six weeks later, at the base of the hills, the water continued scalding hot, and sent forth steam at every wash of the waves."

Professor Alexander's Account.

Mr. Editor,—At a time when all information relating to the eruption is eagerly received, a brief sketch of what the company to which I belonged saw and did, may be interesting to your readers, particu-

larly as we reached the source by a route different from that taken by any other party, excepting perhaps Mr. Vaudry. Our party sailed from Honolulu in the *Kinoole*, on Tuesday, February 1st, and landed at Kealakekua Thursday noon. During the preceding night we had a distant view of the eruption, like a star, two-thirds up the mountain, with streaks of light branching out from below. Friday was spent in preparations for the jaunt, and on Saturday morning we set out for the crater, from Kuapehu, in a direction nearly East. * * *

As we began to emerge from the woods we had a fine view of the jet, playing at a distance of perhaps twenty-five miles, to the height, as we afterwards estimated, of 300 feet. It was of a deep red colour, in form and movement exactly like a fountain, and was accompanied by immense columns of steam. It was soon concealed from our view, however, by the flanks of Mauna Loa. About twelve miles from the coast road we reached a watering place called Waiio, which we found nearly dry.

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

During the afternoon, the party, being in want of water, pushed on six or eight miles S.S.E. to a well known watering-place called Puapuawai, where they encamped. At this point the cold was so intense at night, that a crust of ice half an inch thick was formed in our calabashes, and the berries around our camp were frozen hard. As far as we could judge by the horizon, we were about a thousand feet lower than the summit of Hualalai, and, accordingly, 8,000 feet above the sea. On account of the failure of this spring, as well as for other reasons, it was thought expedient to divide the party. Half of them, headed by President Beckwith, returned to Kaawaloa, and went out to the lava flow by Governor Adams's road.

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

About noon we crossed a recent flow, perhaps that of 1847, and at 4h. p.m. (Feb. 9th), after a march of about twenty miles N.E., we suddenly found the two active craters and the lava stream in its whole extent immediately below us. We encamped a mile and a half S.W. of the larger cone, on an eminence commanding a fine view of the whole eruption. Large banks of snow and ice were found within a quarter of a mile from our camp, so that all anxiety on the score of water was soon dissipated.

The sight which we enjoyed that night will not be forgotten by any

of the party. The jet had ceased to play, but the two craters were blowing off enormous columns of steam and showers of red-hot scoria with a noise like that of heavy surf, or occasionally like discharges of artillery. Half a mile below the lower crater appeared a cataract of fire, continued for several miles in a winding river of light, which then divided into a net work of branches, enclosing numerous islands. The branch towards Kawaihae still gave a dull red light in a few spots, but the force of the stream seemed to be directed West, towards Kona.

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

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

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

It was a subject of regret to the party that they did not have a barometer to measure the elevation of the source; but, taking all things into account, we think it cannot be less than 8,000 feet, and is probably nearer 10,000 feet, above the sea. The elevation of the "Heiau of Umi" is given by Wilkes at 5,000 feet, and we think the source of the eruption is certainly 3,000 or 4,000 feet higher.

We slept on the warm lava that night, and early next morning revisited the lower crater, and followed the central flow for half a mile, passing two or three small cones, till we reached the present outlet, to which the stream evidently has found its way from the crater by a subterranean channel. It was in appearance a pool of blood, a few rods in width, boiling up like a spring, and spouting up thick clotted masses to the height of ten or twenty feet. One of our party approached near enough to run his pole into it. On the lower side it poured in a cataract of molten metal, at a white heat, down a descent

of about fifty feet, with a roar like that of heavy surf. A strong South wind was blowing, which enabled us, by holding our hats before our faces, to get within a few feet of the brink. The lava appeared almost as fluid as water, and ran with a velocity which the eye could scarcely follow. The solid fragments which now and then fell in, disappeared almost instantly. For several miles the fiery river was a continuous series of rapids and cataracts. At length we reluctantly returned to our camp, a distance of two or three miles across the fresh lava, which in several places was hot enough to burn our sandals.

After taking our breakfast, and starting our natives over the old "pahoehoe" along the South bank of the stream, we returned to the great cataract. The action had greatly increased during the last three hours; the pool had become a fountain, playing to the height of thirty feet, and the falling pieces were fast forming a crater around it, the rim of which was already ten feet high, but open on the lower side to afford an outlet for the torrent. Two smaller jets were playing above it, which will probably unite with it to form one crater. The upper one threw up light pieces of pumice to the height of sixty feet, and was forming a very regular cone.

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

To describe the scene is impossible. No epithets in the English language are adequate to the task. For the first time we saw actual *waves* and actual *spray* of liquid lava. As its surges rolled back from the enclosing walls of rock, they curled over and broke like combers on the reef. Its forms, however, were bolder and more picturesque than those of running water, on account of its being a heavier and more tenacious fluid. There was, besides, an endless variety in its forms. Now we passed a cascade, then a whirlpool, then a smooth and majestic river, then a series of rapids, tossing their waves like a stormy sea; now rolling into lurid caverns, the roofs of which were hung with red-hot stalactites, and then under arches which it had thrown over itself in sportive triumph. The safety with which it could be approached was matter of astonishment to us all.

After following it six or eight miles, we halted for dinner on an island about a quarter of a mile from the largest fall, and then proceeded down the stream till 4h. p.m. As the descent became more gradual, the torrent changed its colour, first to rose-colour, then to a dark blood-red; its surface began to gather a greyish scum, and large drifting

masses became frequent. It now began to separate into numerous branches, and it became more unsafe to follow the central stream, as changes were constantly taking place, and our retreat was liable to be cut off at any moment. We therefore kept nearer the edge of the flow, and at length encamped on an island in the woods. During the night the craters were very active, and the whole plain seemed to be on fire below and above us.

The party was called out by four o'clock the next morning, and went up a short distance to observe a new stream which was pouring down through the woods to our camp. It was a shallow flow in a high state of fusion, and was forming smooth *pahoehoe*. Its mode of advance through the woods, girdling and slowly consuming the trees, the surface constantly cooling over and breaking up by turns, was exactly the same as that observed at Hilo, and needs no description. Here we were able to take out as many specimens in a liquid state as we wished, to insert coins into them, and if we had carried moulds with us, we might have forced the liquid into almost any required shape. We spent the forenoon in following the stream to the plain, partly crossing it in some places to reach the scene of a new overflow. We had been particularly curious to see how clinkers are formed, and our curiosity was now gratified. The difference between *pahoehoe* or smooth lava, and *aa* or clinkers, seems to be due more to a difference in their mode of cooling than to any other cause. The streams which form the pahoehoe are comparatively shallow, in a state of complete fusion, and cool suddenly in a mass. The *aa* streams, on the other hand, are deep, sometimes moving along in a mass twenty feet high, with solid walls; they are less fluid, being full of solid points or centres of cooling, as they may be called, and advance very slowly. That is, in cooling, the *aa* stream *grains* like sugar. At a distance it looks like an immense mass of half red-hot cinders and slag from a foundry, rolling along over and over itself, impelled by an irresistible power from behind and beneath. That power is the liquid stream, almost concealed by the pile of cinders, which has been formed from itself in cooling. We heard frequent explosions, caused by the lava penetrating caves and blowing them up. The principal stream of running lava which we saw on the plain, was three or four miles S.E. of the extremity of the Judd Road, and was moving W.b.N. At this we left the lava stream, and descended to Umi's temple by a short cut, through an open forest of pahoehoe. We reached the heiau about three p.m., and arrived at Mr. Johnson's about eight o'clock the same evening. The other division of our party had already visited the flow by way of Governor Adams' road and had returned. We sailed again from Keauhou the following Tuesday, and arrived in Honolulu Sunday morning.—*Pacific Commercial Advertiser.*

Currents of the Pacific Ocean.

(Continued from page 376.)

Currents in Behring Straits and the Arctic Coast of America.

The following remarks on the currents of Behring Strait and along the North coast of America, made by Mr. John Simpson, Surgeon of H.M.S. *Plover*, in the August of 1852, may not perhaps be deemed useless, as they will tend to correct the erroneous views given in some of the most authentic current charts of these regions lately published. The main streams only have been alluded to, without noticing the eddies and counter-currents of local and temporary existence.

Through the large opening between the American and Asiatic continents, occupied by the Aleutian Islands, there is an almost imperceptible set from the Pacific Ocean northwards, the waters of which, retaining the impulse given to them by the earth's rotation in a lower latitude, draw towards the American shores and throw themselves into Norton Bay. They are thence driven with increasing force along the coast line of America, opposite the island of St. Lawrence, diffusing themselves to the northward of that island to be carried with lessened speed through the strait of Behring,* after receiving in the latter part of their course the fresh water stream falling through Grantley Harbour into Port Clarence. Spreading again over a larger space they receive a further tribute from Kotzebue Sound, which is very palpable off Point Hope. Again, in the latitude of Icy Cape the earth's rotation gives them an easterly set, forming an almost constant current along the North coast of America to Point Barrow, whence it pursues a direction N.E. Throughout all this course the current is subject to retardations, and even surface drifts in an opposite direction, caused by northerly and north-easterly winds; but it is also occasionally accelerated by S.W. and westerly gales.

In the absence of actual observations for determining the currents in these seas, the proofs of the existence of such a one as that described are collected from other circumstances, the chief of which are as follow:—

In the beginning of summer the eastern side, South of the strait, is free from ice, and Norton Bay itself is usually cleared as early as April. After the middle of June not a particle of ice is to be seen between Point Spencer and King Island, whilst the comparatively still water North of St. Lawrence Island is hampered with large floes

* The strait of Behring is here understood, in its restricted sense, to be the interval between the East Cape of Asia, and the Cape Prince of Wales of America, in which are situated the Diomede Islands. Between these and the island of St. Lawrence is understood to be Behring Sea; and South of the last named island, with Norton Sound or Bay on the one side, and the gulf of Anadyr on the other, is the sea of Kamtschatka.

The compass points mentioned are true not magnetic.

until late in July. This can be satisfactorily accounted for by the existence of a northerly current of warmer water, partly driving and partly thawing the ice from the American shores.

There is scarcely a particle of driftwood to be had on the Asiatic coast from Kamtschatka to East Cape, whilst abundance is to be found in Port Clarence and Kotzebue Sound, as well as along the whole of the American shore from Norton Bay to Point Barrow. Although it has been found that pine trees sixty inches in girth grow here, on the banks of American rivers, within the sixty-seventh parallel of latitude, yet from the frequently larger size of the trunks and their great abundance, it is evident these northern regions, including Norton Bay, cannot supply the quantity; and more southern rivers, whether Asiatic or American, or both, must be looked to for the immense multitude of water-worn stems and roots strewed almost everywhere along the beach. Their southern origin would also seem to be indicated by the presence in many of them of the remains of the *teredo navalis*, which could hardly retain life throughout the rigour of eight or nine months' frost every year. Captain Wellesley mentions having picked up on the North side of the entrance to Port Clarence, a buoy which had been previously lost from the anchor of the *Dædalus* off the island of St. Lawrence.

It would seem that between St. Lawrence Island and the coast of Asia the current is variable and seldom entirely free from ice until late in July, hence the many disasters to whalers in 1851, and the difficulties the *Dædalus* and *Enterprise* encountered the same season by taking the western passage, whilst an open boat from the *Plover* was able, between the 17th of June and the 1st of July, to make the run to Michelowski, in Norton Bay, and back without her crew seeing any ice. The *Amphitrite*, in 1852, was able to reach Port Clarence on the 30th of June, by the eastern passage, without seeing but one floe, which had probably been recently released from some of the nooks of Norton Bay, although late in the same month the master of a whaling ship reported that the ice was still fast as low as latitude 58° and 60° between the longitude of Gore Island and the coast of Kamtschatka.

From the recorded observations beginning with Captain Cook, continued by Captain Beechey in the *Blossom*, Captain Kellett in the *Herald*, Captain Moore in the *Plover*, Commander Pullen in the *Plover's* boats, and again by Commander Maguire in boats this season, 1852, it appears that the coast from Icy Cape to Point Barrow is frequently packed with ice in the end of July and the beginning of August. The cause of this seems to be the occasional presence of westerly and north-westerly winds, which drive the pack upon the coast, again to be cleared away by the North-East current along shore as soon as these winds have spent their force; and southerly and S.E. winds will have the opposite effect of driving it in a more northerly direction and leave the navigation more open than usual.

At Icy Cape the current on Captain Beechey's chart is marked as

running both ways along shore, but not, it is presumed, with the regularity of a tidal ebb and flow. Duriug the continuance of an easterly gale, from the 29th of July to the 4th of August, and a fresh breeze for two days following, at that cape, floating substances were observed to drift slowly to leeward, whilst the waves were short, irregular, and much more broken than usual, to a distance of twelve miles off, as if caused by a weather current; this may, however, be partly owing, for half that distance, to the shoals extending four miles off the land. On the 3rd a whaling vessel stood in to within six miles of the shore, tacked, and stood out again, making such progress to windward as a sailing vessel could only do when favoured by a strong weather current.

From Icy Cape to the Seahorse Islands in addition to driftwood there is strewed along the beach a quantity of coal, which, though much water worn, may, in some of the indentations, be collected in sufficient abundance and bituminous enough to make an excellent fire for cooking. It is of the sort called glauer or candle coal, and some of the pieces are sound enough to be carved by the natives into lip ornaments. At the Seahorse Islands it is found as fine as small gravel, and on digging into the beach is seen to form thin alternate layers with the sand; but between Wainwright Inlet and Icy Cape it is gathered in knobs of a convenient size for fuel. This may be taken as a further evidence of the set of the current, as the nearest known point whence the coal is brought is that marked on the chart as Cape Beaufort.

The whole extent of coast from below Icy Cape to Point Barrow is bordered by a beach of gravel, which has likewise a southern origin, and determines the form of the continent, offering as it does an effectual barrier to the encroachments of the sea, which would otherwise speedily undermine the earth cliffs behind. All that can be seen from the seaboard, landward, is a flat alluvial plain, seldom exceeding twenty feet in elevation, and containing numerous pools or lagoons of fresh water; but without a tree or bush to relieve the view.

The tides are hardly appreciable and very irregular at Kotzebue Sound and Port Clarence. Then, the sea usually retains a very low level during the prevalence of northerly, north-easterly, and easterly winds; and the highest levels occur with southerly and south-westerly gales. During a stay of seven days at Icy Cape, with a prevailing gale at East and E.N.E., the same low-water level obtained as much as four feet and a half below the highest surf mark, the undeniable effects of westerly and S.W. winds. With the drifted material left on those marks where the shore has a westerly aspect were several varieties of dead shells, identical in species with those previously dredged from the bottom of the sea in deep water (twenty-five to thirty fathoms) in the straits and North of them. If, as is presumed, these were deep sea shells they would afford further proof of the easterly set of the current, as the waters of the sea are not agitated by the most violent storms to such a depth; and if their habitat be equally in shallow water, it is difficult to imagine why they are not

found in equal abundance on those parts of the shore exposed to North-easterly winds.

As far as Icy Cape this coast current is less than that sweeping thence to Point Barrow, and there is reason to believe the increase is derived from the waters on the North coast of Asia, where the loss may possibly be supplied from that portion of the Gulf Stream that flows towards the North cape of Europe. Standing on Point Barrow it may be seen that the body of moving water is broad, and soundings have shown it to be also deep. Its mean speed is certainly not less than one mile an hour in a direction nearly N.E., but it is of course a matter of mere conjecture to what distance it follows that course, though Davis Strait may be assumed as its probable outlet.

Navigation of the Pacific Ocean.

From the Atlantic the Pacific Ocean is entered either by the West after doubling Cape Horn, or by the East on doubling the Cape of Good Hope. In this latter case the Indian Ocean must be crossed to reach the Pacific, and one of the numerous straits adopted which connect the two seas; or the course South of Australia.

In continuation of the subject of the routes for crossing the Atlantic as well as the Indian Ocean, those for the Pacific by the East or West are here explained according as the ship is bound to the eastern coasts of Asia, Australia, or a port in the western Pacific, or whether that may be in its eastern part on the coast of America.

These remarks will be followed by those on the principal routes for crossing the Pacific Ocean, and from which others may be easily deduced.

It will be convenient to divide the subject into,—

1st.—Routes from the American ports to China and Australia and back; also routes from India or China to the East coast of Australia and back.

2nd.—Routes from India and China to Australia by Torres Strait, with instructions for its navigation, and the eastern coast of Australia and back by Torres or Pitt Straits.

3rd.—The navigation of the western coast of America.

First Part.

From the West Coast of America to Manila or Macao.—There are two great routes from the western coast of America to Manila or Macao, or any other point of the southern coast of Asia, that may be taken according to circumstances or the object of the voyage: they are called the great Southern and Northern Routes.

Great Southern Route.—The great southern route is taken only by ships from the southern ports of America. These also often prefer the northern route.

Vessels from Chiloe, Lima, or Guayaquil bound to China or Manila,

on leaving the coast generally run direct down the S.E. Trade for the archipelago of Nouka Hiva, and afterwards pass South of the Gilbert Archipelago and northward of the Pellew Islands. Beyond these islands the route then depends on the state of the monsoons in the China Sea.

In the S.W. monsoon the strait of San Bernandino is generally adopted. In the N.E. monsoon ships pass North of the Philippines, through the Bashees and between Formosa and Lucon.

An essential point when bound to Macao is that the coast must be made in a latitude according to the monsoon. If a ship make it only one degree too much North or South, or in other words, if she be 1° of latitude to leeward of the desired point only, the voyage may be delayed for several weeks.

It may be observed also respecting this route that it is most advantageous from March to October, the period when the S.E. Trade winds blow over the whole extent of the ocean; while from October to February variable winds from West and S.W. prevail, accompanied by bad weather. The most favourable time for leaving the American coast for this route is from February to July. The same route also will lead to Australia, if, after having passed West of the archipelago of Nouka Hiva, a course be steered so as to pass East or West of Samoa, Tonga, and the Fejee Islands, or between these different groups. From them a course for the desired port of Australia may be shaped.

Again, if bound to China, the above route may be modified thus:—The course will be followed South of the equator to the meridian of 164° West. From thence the course is changed to N.W. to pass North of the Gilbert Islands and then between the Mulgraves and the Ralick Islands, passing these last to the South, and attaining 13° or 14° N. lat., then steering West to pass South of the island of Guam, so as to make a straight course for the strait of San Bernardino. This strait must be entered cautiously, for its entrance is very narrow and beset by strong currents and eddies, the effect of the tides. Having cleared this strait, the China Sea is entered by the strait between Mindoro and Lucon, and the monsoon is then fair for the port. In this route should a vessel pass between the Marianne Islands, this may be done boldly, for all the channels between them are safe.

From North America to China.—The passage from the North American coast to China is made in the N.E. Trades, and is adopted by vessels from ports North of the equator, and very often by those also from ports South of it.

In this route those calms must be avoided, met with in the southern hemisphere near the numerous islands scattered about, and which calms considerably lengthen the voyage, and the difficulties also of the passage, occasioned by the uncertain position of islands, which are not yet well determined. This route, moreover, is always the best for vessels from ports North of the equator, and most favourable during the months from July to February.

Where to Cross the Line.—On leaving the American coast a vessel should make direct for the N.E. Trade. Coming from the southward she would cross the belt of the equatorial variables, and it would be best to do so between 117° and 132° W. By the table in chapter i. it will be seen that the zone of these variables is generally less in winter and spring in the northern hemisphere than in summer and autumn; and hence the course may be shaped so as to profit by this information to reach the N.E. Trade as soon as possible, for when they are well established they are stronger than those from the S.E.

In the passage from the southern to the northern hemisphere the vessel will have to cross the equatorial counter-current already mentioned, and which sets strongly to the East and E.S.E. in about 4° or 5° N. This must be crossed as quickly as possible, and the N.E. Trade will be generally found between the parallels of 5° or 6° N. when the sun has a South declination, or between those of 9° and 10° N. when it has a North declination.

Once in the N.E. Trades, should a ship intend touching at the Sandwich Islands, she would steer directly for them, making them on an East bearing on account of the current. From these islands she would steer West, keeping between the parallels of 13° and 15° N., where a fresh Trade is more certain than in a higher latitude, and she would keep this course until gaining the meridian of the Marianne Islands.

A vessel not touching at the Sandwich Islands should keep on the parallel of 12° or 13° N., profiting by current and wind. If the latter be weak she has only to run about half a degree more to the northward to find a fresher breeze, a measure she can always adopt when necessary. In this run a ship may keep her old sails bent, but from the meridian of those islands westward it will be prudent to change them, for now she will meet with strong northerly winds, varying to N.E., with a heavy sea.

From the Marianne Islands, according to the monsoon which prevails in the China Sea, a course more or less to the northward will be shaped according as necessary. While the N.E. monsoon prevails in the China Sea, and in the neighbourhood of the Marianne Islands strong northerly breezes are found, the current runs southward, for which allowance must be made in order to keep for the channel South of Formosa to enter the China Sea; so that in running between the Marianne Islands the channel between Assomption and Grigan should be taken; or even to pass northward of the archipelago in order to secure reaching the strait so as to round the Bashee Islands to the northward, allowing for the current, which in this strait often runs S.S.W. with northerly winds. As already observed, bad weather is frequently found in this channel.

At the time of the S.W. monsoon the strait of San Bernardino should be taken, and the course should be previously shaped for it.

The foregoing route is nearly that which was followed in former days by the Spanish galleons from Acapulco to Manila. Those ves-

sels left Acapulco so that they might reach the Philippines before the month of May, the time when the S.W. monsoon commences among these islands; and they returned from Manila in July. In going, they generally touched at the Sandwich Islands, and from them steered for the Mariannes, anchoring at the island of Guam; and from thence they steered for Samar.

Return Route from India or China to the American Coast.—To return from India or China to the coast of North America it is highly important to start while the S.W. monsoon prevails, as it extends so far over the Pacific as the environs of the Marianne Islands, affording thereby the means of making a quick passage. A vessel should therefore leave Manila or the ports of China towards July, and having gained the parallel of 34° N., should keep it, running East with the Japan Current and the general westerly winds of these parts, which appear to be nearly as constant as the Trade winds, and to which the name of the westerly Trades has been given. These winds will take her to the coast of California. If bound to a port more to the southward than California, a course should be shaped accordingly, taking care to cross the N.E. Trades obliquely.

China or Manila to South America.—Vessels from China bound for the coast of Peru or Chili should adopt the foregoing route. They should then cross the N.E. Trades obliquely till they reach the S.E. Trades, and should cross these, running well to the southward, so as to get South of the parallels of 28° or 30° S. as soon as possible, and reach the temperate zone of this hemisphere, where the prevailing winds are westerly; with which they may soon reach their destination.

With the N.E. monsoon, in the China Sea, it will be very difficult to follow the above route. It will be very trying to get North of the N.E. Trades into the westerly winds, and doing so will render their passage much longer than if they had sailed in the S.W. monsoon.

Vessels bound for South American ports, leaving the China Sea in the N.E. monsoon, make the voyage in southern latitude, where there is much danger, arising from the numerous islands and coral banks in that part of the Pacific.

In mentioning the equatorial counter-current we have shown the route taken by Captain Hunter from West to East in the Western Pacific, when he found the S.E. monsoon established there. Those remarks are applicable to return routes from China and Manila to ports situated in the Eastern Pacific, and consequently are applicable to the case before us.

It has also been shown, from the observations of Captain Hunter, that the South equatorial current seldom extends beyond the parallel of 2° N. Consequently, at the time when the easterly monsoon prevails in this part of the Pacific, a vessel can have no difficulty in getting to the eastward by keeping near the equator, and in finding near it the zone where there is no current, and where the counter-current is flowing eastward. Besides, near the equator, during the S.E. monsoon in the southern hemisphere (from March to December), there are variable winds, hanging to the westward. Thus, ships from

the Philippines, Timor, or islands West of the latter, in order to reach ports of the Pacific, when they leave those islands in the first part of December or January, should generally make a good quick passage if they reach North of the Moluccas Channel (Gilolo or Dampier) between the 15th of December and the 15th of March, when the S.W. monsoon is blowing in those parts.

At all other times the direct route for getting to the eastward will be available, provided, as above said, that the ship keep North of the South equatorial current and the zone of the monsoon, that is, by keeping near the equator.

(To be continued.)

The Panama Route and the Australian Line.

Sir,—The long looked-for tender has at last appeared (conveyance of mails to Sydney and Melbourne, *viâ* Panama and New Zealand). I trust you will find space in the columns of your valuable journal for these few lines, as they are penned by one who has not only travelled the Panama and Suez routes, but has visited thirty-seven islands in the South Pacific, and been a resident in New Zealand for upwards of twenty years. From experience it is my intention to suggest to the contractors of this line the names of two or three places suitable for their stations, as well as a few remarks upon the route generally, and my reasons for such suggestions.

The boon so long sought for and now about to be conferred upon the Australian colonies, will not only be of the greatest importance to the Australians, but to the company accepting the tender, providing the contractors display a liberal feeling towards the Australians, which feeling, they may rely upon will be responded to by the colonists. I am glad to find that the feelings of the Victorians are now in favour of this line. It is well known, at all events among ourselves, that our imports and exports are annually between fifty and sixty millions sterling; consequently, a fortnightly mail with the mother country is much required. Passengers from the Australian colonies will not (with few exceptions, and on emergencies) pay £120 to be transferred from there here, neither will they pay 7*d.* an ounce freight on gold dust when a sailing vessel will bring it home for 3*d.* per ounce.

I find that by the last Royal Mail steam-ship *Oneida*, from Australia here, her passengers were 114, gold on freight £77,000; rates of adult passengers, £90 each. In the last of the Peninsular and Oriental Company's vessels, the *Emu*, from Australia, there were only 14 passengers (excluding 6 from Adelaide): passage-money by the Peninsular and Oriental, £120 for adults; European servants, £60; gold on freight, about £3,000 (hardly worth mentioning). The last

departure of the Royal Mail Steam Packet Company's ship *Teviot* took out to Australia 31 passengers; the last departure of the Peninsular and Oriental Company's ship *Ceylon* took out only 9 passengers to Australia. The *Great Britain*, auxiliary screw steam-ship, from Australia to Liverpool, comes home round Cape Horn in 65 days, bringing 325 passengers (first, second, and third class); passage-money ranging from £15 to £70 a head per adult; and upwards of £100,000 worth of gold—the freight on gold I presume at a reasonable rate.

I maintain that any steam company, assisted with a large and handsome subsidy, can without loss to their shareholders (but with a good profit) carry backwards and forwards to the colonies passengers (first, second, and third class) for the same reasonable sum as auxiliary steam or sailing vessel companies who have no subsidy. This is not only a consideration for the directors of the fortunate contractors of the present line, but a very serious consideration for their shareholders. If the present contractors for the Panama line will consider their own interests combined with the interests of the colonists, they will do well, and the colonies will prosper under their contract; if not, they will shortly find a most determined and successful opposition with the auxiliary and sailing ship companies, especially from Liverpool, into which port the majority of the passengers and bulk of cargo and gold has for years been imported from the said colonies. Where one passenger comes home overland from the colonies, fifty come by sailing vessels; and for every ounce of gold imported here overland 5,000 come by sailing vessels. Freight on gold on £12,000,000 at 7*d.* comes to £350,000; but at 3*d.* the same comes to only £150,000: making a difference to the exporters of £200,000 annually.

The Panama line, when fairly established, will, without a doubt, be known as the Australian route, and be supported by the Australians liberally. The Suez line will as usually be called the Indian route. A second postal line between the colonies and England has long been sought for even by all the colonial governments, and the colonists generally appear to be of the same opinion. The geographical features of a colony cannot be changed, but the establishment of the Panama route, the advantages of the earliest point of departure, or the earliest arrival, may be shared by more than one colony, and thus the local existing jealousies of the Australian colonies will be brought to a termination, and all the colonists mutually benefited, as well as thousands of our merchants, by this fortnightly line. It must be borne in mind that the Panama route is much less liable to obstructions than the Suez route in case of European war.

Some people imagine that Panama is an unhealthy route,—such ideas are absurd. If passengers by that route are at all alarmed, they have only to walk from the steamer's deck in the Pacific Ocean into the railway carriage which will convey them across the isthmus and into the steamer in the Atlantic Ocean in the short space of time of about one hour and a half. The Panama route home from the

colonies is a pleasant route compared to the Suez route, where the hot wind and calms in the Red Sea for three or four months together make the slightest description of clothing almost intolerable to passengers. Not long after the fortnightly mail to these colonies is established we shall require a weekly mail, as our trade is increasing so rapidly.

Few, perhaps, will believe that the tonnage employed between New Zealand and Australia is greater than the tonnage employed between Australia and London, the former being 41,000 and the latter 40,500 tons annually. The Panama route will in all probability open up a new trade between the Australian colonies and South America, Central, and North America, as well as with many islands in the South Pacific, many of which are not far distant from Australia or New Zealand, especially the Fejee Islands, a most valuable group. Our government and our merchants here are in complete ignorance not only of the value of these islands, but of their exports, which annually amount to many hundreds of thousands of pounds sterling, some of which exports are pearls, pearl shell, beche le mer, sandal wood, cocoa nut and sperm oil, tortoise-shell, arrow-root, sugar, and a small quantity of coffee, cotton, &c., nearly the whole of which trade has for the last twenty years been carried on by Brother Jonathan in a very quiet manner. I firmly believe that small steamers will shortly be running from some of these groups of small islands North of Sydney and New Zealand, when the Panama route is fairly established, and that the time is not far distant when these islands will be to the Australasian colonies what the West India islands were to England before the emancipation of the slaves. Why should not Australia have its spice and sugar islands, when its imports and exports are between £54,000,000 and £60,000,000 sterling annually?

With regard to the steamers between Panama and Sydney, my opinion is that five should be employed. If Tahiti is to be the calling station, there is little doubt that the French government will allow a handsome subsidy to the contractors, for not only the conveyance of mails there, but to New Caledonia, which I shall presently refer to. If Tahiti is not to be a calling station I can name one or two other islands equally good; but wherever the midway station may be between Panama and Sydney, the fifth and a first class boat should be kept there in case of need. The two steamers to be employed between Panama and the half-way station should be built somewhat on the Gravesend boat model, large enough to carry 300 or 400 passengers, making every allowance for ventilation for tropical passages. It will be between Panama and the half-way station that the great daily runs will be made, from fourteen to seventeen miles an hour—mill-pond sailing. If proper boats are placed here in course of a reasonable time, the passage to New Zealand may be made in thirty-nine or forty days, and to Sydney in forty-four or forty-five days. The other two boats between Sydney and the half-way station should be powerful boats. Believing the Peninsular and Oriental Company are not under any penalty or fine for the non-fulfil-

ment of their contract for the Australian line *viâ* Suez, I do not see why the present contractors should be placed under heavy penalties *viâ* Panama. In place of the government munificence of allowing £50 per diem for any number of days under the contract time, they might increase this sum to £500, but in my humble opinion penalties and fines are all humbug.

Having made a few remarks on this route, I will now name two ports in New Zealand most likely to suit the contractors, viz., Mongonni and Auckland. Mongonni is a snug little harbour, sheltered from all winds and sea swell, with a safe entrance from Doubtless, or, as some call it, Loriston Bay, and is about three hours' sail from the North Cape of New Zealand. In this harbour I have seen twenty-seven ships at anchor at one and the same time. Should this port of entry be fixed on, a coaling wharf will have to be made, also conveniences for watering (of which there is a never failing supply). One objection to this port by the New Zealand government would be that they would be compelled to place a small steamer on the line between Auckland and Mongonni for the conveyance of the mails and passengers, which would cost from £4,000 to £5,000 a year. Any provisions may be obtained here.

Supposing this to be the calling port, the French government at New Caledonia could send one of their steamers here to be in readiness to receive their mails from France and Tahiti *viâ* Panama on the mail steamer's arrival. They could then return to New Caledonia, which would not take them a longer time than it would take the mail steamer to go from Mongonni to Sydney. Such being the case, the French at New Caledonia would have the same time to answer their letters by the homeward and same boat as the Sydney people, for which accommodation the French subsidy would naturally be expected; but should the mails be landed at Auckland, it would only make a day and a half or two days' difference to the French, but give them ample time to answer their letters.

Auckland, the seat of government, certainly has a prior claim to Mongonni, especially if the interest of the bulk of the population is to be considered. Being the seat of government, it is the headquarters of the military forces and commissariat department, and the province contains about 40,000 of the native population, the latter being very valuable to any steam company in the coaling department. The entrance to the harbour of Auckland is first-rate, with ample room for a large fleet to anchor. Its entrance being so very accessible, there is no lighthouse at present. No vessels have been lost there since the foundation of the colony, which says much for its harbour. About seven or eight years ago, anticipating that the Panama line of steamers would call there, a mercantile firm went to a great expense in building a coaling wharf, and for watering the steamers, which I have no doubt could now be purchased or leased at a reasonable price or rent. In fact, Auckland is already well prepared for the mail line, should its steamers call there. In that case I recommend the contractors of the Panama line to come to some ar-

rangement with Messrs. Coleman and Co., who are under contract with the New Zealand government to carry our mails to and fro between New Zealand and the colonies, with a subsidy of £24,000 a year. If an amicable arrangement could be made, the Panama boat could remain in Auckland for ten days, during the time the colonial boat took the mails and passengers to Sydney *viâ* Manakau, during which time she could coal, clean, and, if necessary, repair.

Manakau is a fine extensive bar harbour. The bar is of no inconvenience to a large steamer, there being sufficient water for a line-of-battle ship. The distance of this harbour from Auckland by land is five miles and a half: a tramroad is now being made between the two ports, and telegraph wires to the heads of Manakau from Auckland. One great advantage in the Manakau route will be the splendid and extensive coal fields which have lately been discovered there coming down to the edge of the Manakau waters; there has also been another coal field lately discovered at Wangaroe Harbour, about fifty miles North of Auckland, both of which samples of coals have been tested and reported on most favourably to the government by Dr. Hochstetter, who is the geographical and scientific officer of the Austrian frigate, *Novara*.

If a satisfactory arrangement cannot be made with Messrs. Coleman and Co., I recommend Mongonni the port for landing and taking on board the mails and passengers, as the detention there need not be more than a few hours, and the course from there towards Panama should be made in the variable latitudes. Some people fancy that Wellington, in Cook Strait, would suit to call at on the homeward voyage from Sydney, provided the steamers did not go to Auckland on their way out, but I consider it would not only be very unsatisfactory to the contractors, but to the Australian colonists, whom we may thank for being the originators of this line, and whom the public have to thank for the handsome subsidy, granted by their parliament, of £50,000 annually for ten years. The contractors would also also lose about three days on each voyage by going the extra distance. Another reason for not making Wellington one of the calling ports is that the insurances on ships and cargo are nearly half as much more to Wellington as they are to Auckland.

I am, &c.,

WALTER BRODIE.

[The importance of the foregoing, addressed to the *Daily News*, has induced us to preserve it here.—ED.]

THE LOWER DANUBE.

Sulina, July 1st.

The waters of the Lower Danube have at all times a powerful likeness to pea-soup, but at the present time they represent that par-

ticular version of the dish one meets with on board North country ships, where its whitey-brown surface is diversified by a copious addition of celery seeds. The celery seed is well imitated in the Danube by the countless locusts which cover the stream, sometimes in dense masses, sometimes in broad bands stretching obliquely across the river. For miles out at sea they are found floating in millions, both off the Sulina and St. George mouths, for their wings have not yet grown, and the North wind drives them into the stream, some reaching the opposite bank, to devastate the marshy plain, others being carried along by the force of the current. The long tents of the officers of the gunboats here, erected on the northern shore, were literally covered with them, and the brown ugly brutes were hopping into everything eatable and drinkable, and men slept, walked, and sat in locusts, crushing them at every step. In about six weeks their wings will have grown, and they will have increased vastly in size and voracity, so that serious apprehensions are entertained for every green thing. At present they have not made their appearance higher up than Tultscha, and there is little but reeds for them to devour at the mouths of the river; but should they extend their ravages further, the consequences will be serious.

The provisional works of the Danube commission are progressing here, both the northern and southern jetties being carried out some twelve or thirteen hundred feet, but only partially filled in, and the southern one still left in skeleton. The action on the bed of the river gives every encouragement to hope that the ultimate removal of the bar will be effected, the present depth of water on it being 8¾ feet. The narrowness of the Sulina branch, and the extremely tortuous course of the stream, will nevertheless always operate as a serious objection to selecting that channel as the chief road for the produce of the Danube. On the other hand, the St. George channel, the mouth of which is some miles to the South, is a broad and deep stream, having however the serious obstacle of a narrow and difficult entrance. This defect it is proposed to overcome by cutting a short canal through the marshy ground on the northern side of the river and constructing an *avant port* of masonry, the estimated cost of which is about £500,000, while the works in progress at Sulina will cost from £35,000 to £40,000. The cost of these works is a charge on the Moldavian tribute, but the money comes in very slowly and irregularly, and I believe the operations must have been suspended had not the commissioners rendered themselves personally responsible for the funds advanced from other sources.

Major Stokes, the British commissioner, is a capital representative of the English gentleman in his appearance and style of living, whilst the officers and crews of our gunboats are the puzzle and terror of the subaltern authorities of Galatz. The blue jackets hold the armed force of the Principalities in no manner of esteem, considering the orders of their officers superior to everything else, and being quite prepared to bring off the whole municipal guard, arms and baggage, on board the gunboat, should the necessity for so doing arise. I do

not know what the Rouman army may be elsewhere in the Principalities, but a more unsoldierlike collection of men and officers than figures at Galatz one could hardly meet. As regards the officers, there is nothing to complain of on the score of uniforms. The amount of moustachios and gold lace, long swords and wasp-like waists one encounters now-a-days in Galatz, is something fearful to contemplate. But as regards soldiers, there is a ha'porth of bread to an intolerable deal of sack, and as to their utility, my last sight of a Moldavian soldier was the sentinel guarding the gates of the steamboat wharf, over which two men were climbing, the eyes of the watchful functionary having been doubtless directed elsewhere by a judicious application of two or three coppers.

One encounters continually a set of tightly-buttoned epauletted officers, fastened to a heavy cavalry sword, and belted in at the waist within an inch of their lives. On inquiry I found they were only *employés* of the telegraph, and what they do with their swords I cannot imagine. Under the new *regime*, however, everything is arranged on the military and French system, and a wretched caricature it is, just what one might expect from the superficial *hobereaux* of the Principalities, who go to air their dirt and vices at Paris and other continental cities, dubbing themselves princes for the nonce. Galatz now rejoices in all the grandeur of prefet, sous prefet, &c., and, moreover, there is a prefet maritime, who entitles himself in Moldavian colonel-admiral, or something like it, in imitation, I suppose, of the Capoudan Pacha of Constantinople. But this exalted functionary must have an easy berth, as I cannot learn that the Moldavian fleet is even represented by a dummy, so the colonel-admiral having a sinecure, like a reasonable man takes his ease at the door of his official residence, smoking his pipe and sitting in his drawers, with not much coat or clean shirt to speak of, in consideration of the intensely hot weather. It is to be hoped that all these wearers of gay uniforms or great official titles have got their pay beforehand, for somehow the fashion of going a-borrowing has broken out in the Principalities in an alarming fashion.

Any capitalist having a few spare thousands, or rather hundreds of thousands, will find plenty of customers for them with any amount of landed property as security, and a liberal rate of interest, varying from 12 to 30 per cent., or a little more. Prince Couza and his boyars are not men to boggle at trifles like that, especially as the chances of their being able to repay the lender are most remote. The game of politics in the Principalities has almost come to a stale mate. Couza's election and the union of the provinces has answered no one's purpose, least of all that of the unlucky Hospodar, who finds himself utterly powerless, unable to carry out the views of those who placed him in his seat, whereat they are annoyed and disappointed; and worst of all, he is without funds to purchase the support of any influential party in the representative body. It is a dead lock, and matters are not improved by the folly of calling out the ragamuffin militia, withdrawing a multitude of hands from useful labour, and sad-

dling an empty treasury with the charge of a body of soldiers, a calamity second only to the locusts. It is a pity that a few honest and upright men cannot govern these rich provinces, which contain vast sources of wealth, requiring only development; but while everything is so unsettled, and all is postponed to the intrigues for place or power, it is not to be wondered at that commerce is dull and enterprise dormant. But, judging from the past, there is little to expect in the way of improvement from the Roumans themselves. When a Moldavian or Wallach can chatter French, play more or less on the piano, dance, get his feet into patent leather boots, and his hands into *gants glacés*, he thinks he has done all his country can require of him, and that he is thenceforth entitled to enjoy himself after his own fashion, and a sufficiently disreputable one it often is. Providence has given him a fertile soil, but he takes no care to turn it to the best account: it is the splendid cattle of Moldavia, rich in pasture, which furnish our army and navy, and indeed those of other countries, with their finest beef, and yet in all Galatz, a town of 40,000 inhabitants, not an ounce of butter is manufactured, the supply being drawn from Ibraila, where there is a colony of Germans.

Every branch of industry requiring energy and intelligence is conducted by foreigners and founded by them, and yet there is the raw material for abundant progress in the Moldo-Wallachian peasant, but it lacks the fostering care of an intelligent and high-minded proprietary. As it is, the bulk of those gentry have but one object in view, to screw the most they can out of the cultivators, and then rush off to Paris, Vienna, or some German baths to spend the money. It is difficult to decide as to which side of the Danube, the Turkish or the Moldo-Wallach, exhibits the most stupid negligence of the advantages Providence has showered upon it, although it must be admitted that, far behindhand as the Principalities are, they possess a semblance of order and justice which does not exist on the other side of the river. Nevertheless, foreign subjects manage occasionally to secure immunity from punishment through the interference, or rather non-interference, of their Consuls, as in the case of the riot last Easter. On inquiry I found that this "massacre of the Jews," which made so grand a paragraph in the foreign intelligence, reduced itself, when brought down to the level of sober fact, to a few broken heads, which the Jews might have repaid with interest had they not been a herd of arrant cowards. But the Jew of Galatz probably takes it for granted that he is a thing to be abused and kicked, and certainly the Greeks are not a race disposed to suffer any one who will endure it, to lack his full share of abuse and oppression. The disturbance over, the offenders were pointed out to the Greek Consul, who of course did nothing in the matter, so the little amusement will probably be repeated, unless the local authorities take the necessary precautions.

The Danube is very full of shipping, but there is a lull in the export trade, all parties seeming to await the prospects of the harvest, which are very promising, the buyers therefore offering prices which the holders of corn will not accept. Money, moreover, is very scarce;

borrowers being many and lenders few; but I hear that at Bucharest matters are infinitely worse, a mass of clamorous creditors being added to the other calamities, so that Prince Couza's post is anything but an enviable one. Of course the advocates of the old system point triumphantly to this as the result of the double election and the new constitution, while the patrons of the union attribute it to the debasing effects of the past state of things. For my own part, I believe the truth lies between the two, and that the venality of the former system and the intrigues and corruption which brought about the new one have an equal share in the difficulties, financial and political, under which the Principalities now suffer.—*Daily News.*

Nautical Notices.

Particulars of Lights Recently Established.

(Continued from page 332.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
18. Port Nicholson	41° 21·7′ S., 174° 52′ E.	New Zealand	F.	420	30	Est. 1st Sept., '59. Not revolving as in Notice No. 7, p. 104.
19. Cape Murro di Porco	37° 0·2′ N., 15° 19′ E.	Sicily, East coast	R.	108	20	Est. 1st July, '59. *Eclipsed* every half minute.
19. Cape Themistocles	West Point of Piræus	Gulf of Athens	F.	..	..	Est. 1st June, '59. Two lights vertical *on a mast*. Higher, 43 feet, white; lower, red.
20. Cape Dartuch	39° 54·6′ N., 9° 52·2′ E.	Minorca, S.W. point	Ffl.	70	16	Est. 10th July, '59. The flash once every three minutes.
21. Shell Cays, South end.	29° 20′ N., 91° 49′ W.	Atchafalaya Bay, Louisiana	F.	71	13	Est. 1st June, '59.
22. Hunting Isld. also a Beacon Light	32° 24·5′ N., 80°24·5′W.	St. Helena Sound	R.	108	17	Est. 1st July, '59. *Brightest* every half minute.
	.....	E.b.N. and W.b.S. of former	F.	39	..	Est. 1st July, '59. After which Light-vessel on bar will be removed.
23. Great Isaac Rock	26° 2′ N., 79° 6·5′ W.	Gt. Bahama Bank	R.	158	16	Est. 1st Aug., '59. *Visible* every half minute. Tower painted in red and white horizontal bands.
23. Gun Cay Lt.	.....	.....	..	..	..	Interval of revolution increased to one minute and a half.
24. Cape San Vito	38° 13·2′ N., 12° 45′ E.	Sicily, North coast	Ffl.	142	20	Est. 1st Aug., '59. The flash *red*, once every two minutes.

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

Discontinuance of Lights *on the Coast of the United States.*

The U.S. Government has directed that all the lights heremention ed, with the exception of the light at Shoalwater Bay, be discontinued on and after

the first day of August next, and that the last mentioned light be discontinued on and after the first day of September next:—

Maine.—St. Croix River, Prospect Harbour, Beauchamp Point, and Kennebunk Pier lighthouses.

Massachusetts.—Point Gammon lighthouse.

New York.—Prymes Hook, Catskill Reach, Barcelona, Salmon River, and Cattaraugus lighthouses.

New Jersey.—Tucker Beach lighthouse.

Delaware.—Mispillion lighthouse.

Virginia.—Smith Point lighthouse.

North Carolina.—Ocracoke Channel and Nine Feet Shoal lightvessels, and Beacon Island lighthouse.

South Carolina.—Mount Pleasant lighthouse.

Ohio.—Port Clinton lighthouse.

Michigan.—Clinton River, New Buffalo, Round Island, and Rock Harbour lighthouses.

Illinois.—Chicago, Taylorsport, and Port Clinton lighthouses.

Wisconsin.—South Beacon, Milwaukie, Twin Rivers and Menasha lighthouses.

Washington T.—Shoalwater Bay lighthouse.

TYNEMOUTH BANK,—*Torres Straits.*

Colonial Secretary's Office, Auckland, 8th Feb., 1859.

The following notification received from the Government of New South Wales, is published for general information.

W. GISBORNE, *Under Secretary.*

Singapore, 1st September, 1858.

Steam-ship *Tynemouth*, Saturday, 7th August, 1858, 1.20 p.m., in Torres Straits, about latitude 11° 50′ S., and longitude 143° 32′ 30″ E., passed over a coral patch of apparently about 100 yards diameter, with the following bearings, (true,) not laid down in any of the charts:—Sands of Middle Bank bearing E. ½ N.; East end of Cockburn, Spit S.W.b.W.; Cockburn Islands, W.S.W.; Sir C. Hardy's, North Island, S.W.b.S. ½ S. A clear passage appeared at the spit end of Cockburn Reef, carried four fathoms water on the North end of in the port chains, and in the starboard saw eight fathoms. The coral bunches were plainly visible under the ship's bottom, and about the centre of the patch were just under water.

It was not observed from the topsail yard nor the jibboom end, the sun being before the beam, and was only seen from alongside the ship; it was nearly low water at the time. I have named the bank "Tynemouth Bank," and consider it highly dangerous, being right in the track of ships, and should recommend all vessels after passing the Middle Banks to haul well to the southward and make the spit end of Cockburn Reef, and haul close round it to the North if they intend proceeding through that passage.

JOHN WAKE, Commander S.S. *Tynemouth.*

The American ship *Aleyai*, wrecked on the extreme East end of the N.W. reef in Prince of Wales Channel; she is well up on the reef, and will make an excellent mark for ships entering that channel if not broken up: mainmast and mizenmast standing and yards all across. The ship *Chesterholme* lies on the great detached barrier on her beam end, with mizenmast gone. The

wreck of a paddle steamer lies on the Spile Rocks in Prince of Wales Channel, paddle-wheel shaft, and cranks lying on the top of the rocks, all connected.

JOHN WAKE.

SAILING DIRECTIONS FOR THE MAURITIUS.

It is by no means generally known that the tides along the edge of the reef and between the islands to the North of Mauritius, run at times with a velocity of from five to six miles on the springs; they are equally strong off the Morne, and along the southern coast; their direction is from S.E. to N.W., the flood running to the S.E. and the ebb to the N.W., varying a point or two according to the wind.

Wherever the reefs extend to a distance from the land, the lead, if carefully attended to, will be a tolerably safe guide in the night; but should the lead be overhove when standing towards the shore, haul off immediately whilst preparing for a fresh cast, or you may run your ship aground. From 14 to 20 fathoms is generally a safe distance from the reef, but the soundings vary considerably. Of all the vessels that have been run on ashore or lost on the coast of Mauritius during the last few years, it is not too much to say that the neglect of the lead was without exception the principal cause. The strength of the currents had also something to do with these accidents, but the neglect of the lead was the most important fact elicited in each inquiry.

Where there is no coast reef marked on the chart, the shore is generally bold, having deep water to within a cable's length of it.

Vessels arriving from the eastward and south-eastward, should be careful not to bring the light on Flat Island to the northward of N.N.W. $\frac{1}{2}$ W. until Gunners Quoin bears West, when they may pass midway between it and Flat Island. This course will lead about two and a quarter miles clear of the reefs that extend from the N.E. end of Mauritius.

On passing Gabriel Island, be careful to give a good berth to a reef that extends about half a mile to the S.S.E. of it; this warning applies more particularly to Cooly ships, which having to be visited by the Surgeon Superintendent at the Lazaret at Flat Island, frequently pass much too close to this reef without being aware of its existence, as in very fine weather the sea does not always break on its extreme point.

When to the westward of the Quoin, Cannonier Point Light will be seen. Steer with Flat Island Light astern bearing N.E.b.E. $\frac{1}{2}$ E. until the Cannonier Point Light bears S.E.b.S., (which will carry you clear of the dangerous reef that extends from the point,) you may then haul up S.W.b.S. till the red light at Grand River is seen, bring it to bear S.S.W., and steer for it on that course until the green light on Tonneliers Island bears S.E., when being on the best ground you may anchor in from 12 to 16 fathoms. A nearer approach to the red light at Grand River, would bring a vessel too near the reefs to the southwestward of the entrance of the harbour.

Should the night be clear when running down the coast, the western shoulder of the Corps de Garde Mountain will be seen in line with the Grand River red light when the latter bears S.S.W.

Remember especially that after passing Cannonier Point on your way to the Bell Buoy, the Cannonier Point Light changes from *white* to *red* if it be brought to bear more northerly than N.E. $\frac{1}{2}$ E. This change will warn you that the vessel is too near the reefs that skirt the coast between Cannonier Point and Point Piment.

But this change from white to red is only intended as a guide as far as Point Piment, after passing which the red light at Grand River will be your mark

to the anchorage. It is not well, however, for a large vessel ever to approach so near the reef as to change the Cannonier Point Light from white to red. The great object in view in thus arranging the light was the convenience of the numerous coasting vessels belonging to the colony, to whom (knowing the ground as they do) it is most useful. The best mark for keeping clear of the reefs between Cannonier Point and Point Piment, by night, is to keep the Flat Island Light open to the westward of Cannonier Point Light until the red light at Grand River is seen.

Should you be approaching the Cannonier Point Light from the westward when it shows white, and steering directly for it, there can be no change of colour; but by attending to the bearing of Flat Island Light it will be impossible for you to run on the reef. The barque *Cornwall*, of 947 tons, steering E.N.E. for Cannonier Point Light, was wrecked on the reef within three quarters of a mile of the lighthouse, because it was erroneously supposed that the light changed colour on approaching it whenever a vessel was to the southward of it; whereas it is only when it is brought to bear N.E. ½ E., and to the northward of that, that the light changes colour.

When running for the anchorage by day, after passing Cannonier Point with Flat Island Lighthouse bearing N.E.b.E. ½ E., bring Tamarind Mountain (a conical hill to the westward of all the other high land) to bear S.W.b.S. and steer for it until the Martello tower on the South side of the mouth of Grand River is seen in a line with the western shoulder of the Corps de Garde Mountain bearing S.S.W. This will lead clear of all danger to the anchorage, which is indicated by a floating beacon painted red and white, generally called the Bell Buoy, which lies in 12 fathoms on the North side of the mouth of the harbour. Anchor to the northward of this beacon in from 12 to 20 fathoms.

When approaching by night from the south-westward, Flat Island Light bearing N.E.b.E. will lead between two and three miles to the westward of the reefs to the southward of the port, and when the green light on Tonnelier Island bears E.S.E., steer for it if the wind be favourable under easy sail. If the night be clear the shipping at the Bell Buoy will be seen and afford a good mark. Keep the lead going, and bring the two harbour lights to bear as already described, and anchor.

During the day the Gunners Quoin bearing N.E. ¾ E. is the best mark.

It is most unadvisible to attempt anchoring at the Bell Buoy after dark unless well acquainted with the localities; it is far better, with the admirable advantages afforded by the lights for ascertaining a vessel's exact position, to keep under way till daylight; considerable risk will thus be avoided, and as no communication with the shore is permitted till vessels have received pratique, no time is gained by anchoring in the night.

D. Wales, *Harbour Master.*

Port Louis, September 23rd, 1858.

All the bearings are compass bearings.

Zealandia Shoal,—*Marianne Islands, Pacific.*

The following is an important addition to the chart, there being nothing known of this shoal, which we have called after the ship by which it has been discovered.

Ship Zealandia, E. I. Docks, July 6th, 1859.

Dear Sir,—On my passage from New Zealand to Shanghai last December, in command of the above ship, I shaped a course to pass between the islands

of Sariguan and Farallon de Torres, (Marianne or Ladrone Group,) that passage by the latest charts appearing clear.

December 3rd, 1858, 4h. p.m. Sariguan Island bearing S.S.W. twelve miles, wind light easterly, ship steering W.N.W. about four knots; breakers reported right ahead; saw two large patches about three quarters of a mile from the ship; altered the course to pass to the northward of them about half a mile, with a look-out from the topsail-yard. At 4.20 p.m. Sariguan Island bore S.b.W. ½ W. about eleven or twelve miles, and the breakers in one with the island distant from the ship about half a mile. The two patches bore from each other N.b.E. and S.b.W. about a quarter of a mile, with dark water between and all round them, at times breaking heavily.

I regret that the unsettled state of the weather, the lateness of the day, and the risk of remaining in the vicinity of such dangerous neighbours with a dark night coming on, prevented my sending a boat to examine them more closely. I as well as my officers and crew feel confident that dangerous shoals exist as I have described them. Should these shoals not have been reported before, you will by giving them publicity in your valuable work oblige,

Yours, &c.

JOHN FOSTER, *Master of the ship Zealandia.*

To the Editor of the Nautical Magazine.

LOSS OF THE "ALMA."

Sir,—In attempting to give an account of the loss of the above-named vessel, I shall confine myself as much as possible to a simple recital of the chief incidents of the wreck, our stay on the reef, for three days and six hours, and subsequent relief by H.M.S. *Cyclops*. Who is to blame and who is to be punished a properly constituted court will decide, so without further prelude I shall proceed to give a plain account of the fearful scene in which I was an actor and sufferer.

We left Aden on the morning of the 11th of June, at six a.m., with 160 passengers, and a crew, including the officers, of upwards of 200, making, in all, nearly 370 souls. A slight sunstroke, received on shore, confined the captain to his cabin, so how far he will be held responsible for what occurred I cannot pretend to say. We passed the disputed island of Perim at six p.m., and after the usual routine of tea, grog, arguments, and cigars, went to bed, perhaps half on deck and the rest, including nearly all the ladies and children, below. I was sleeping on deck near the mizenmast, and was awoke at about five minutes past three a.m. by a slight bump, which scarcely shook the ship. This was immediately followed by another equally slight, and then shouts of "Hard a port," "Stop her," "Back her," were heard, but it was too late. Then came a grating sound, and the vessel fell over more and more to starboard, and in less than two minutes the *Alma* was a wreck, without a rope being broken, or, as far as we knew, a rivet started. There lay half a million of money, and not a soul on board would have given two rupees for it.

My first impression was that we had struck a sunken rock, and that in two minutes we should be at the bottom, but a glance over the port side removed this, and gave some slight hope for a few at least, if not for all There extending for about 400 yards, nearly East and West, lay a reef, the most visible point of which rose three feet above the water, and the highest fully thirty. She had struck the eastern lowest point, and the bowsprit reached nearly half way over it. This was a temptation that could not be resisted, so over the bows and on to the reef fled nearly all the Lascars, leaving the ship and pas-

sengers to their fate! By this time the ship was almost on her beam-ends, and to stand on deck was impossible. The lamp in the saloon had been extinguished, and the water was surging over the table fully five feet deep on the lowest side. There were ladies and children below, and some heartrending shrieks were heard, but they were very few, for they behaved well.

The first object was to rescue them from immediate death, and some brave fellows were soon below, and first among them was the surgeon of the vessel, Dr. Williams, whose gallant conduct from the beginning to the end of our troubles all acknowledged and applauded. It would be impossible to describe every incident of that fearful scene, and if it were not, it would occupy more time than I can afford, and more space than you can spare. It will be sufficient to say that after the most gallant exertions every soul was got on deck, and ultimately landed in safety, but in a wretched condition, with no covering but the most scanty night-clothes, and nearly all bare-footed.

It was broad daylight before all were landed, and those who came last suffered least, for sails had been spread for them to land on. I have passed over the difficulty of launching the boats, but when it is remembered that the crew had fled, and that the ship's deck lay at about an angle of 60°, with the weather boats resting on her side, instead of hanging by the davits, it will not be difficult to imagine the magnitude of the task which devolved upon the passengers and Europeans belonging to the ship. The lee boats were already in the water, and had only to be cut away, and even that could not be done before one was forced under water by the davits and rendered, for the time at least, useless. Of seven boats belonging to the vessel we saved five. I will now return to the reef and see what is being done.

Before the sun was high enough to make the heat disagreeable or dangerous, sails and awnings had been brought on shore, and the bare rock soon showed signs of an encampment. The reef was low all round at the water's edge, and for about fifty yards back: it then rose perpendicularly, and in some places even projected to a height of from ten to fifteen feet or more. This formed a back wall, and when a sail was made fast to the rocks above, and supported on a few spars below, a very tolerable tent was formed, and shelter was never more necessary, for we were in the hottest part of the Red Sea, and in the hottest season. We had good reason to be, and I hope we were, grateful to Providence for our extraordinary escape, for had the rocks on the starboard side been ten feet deeper, the vessel must have rolled over and gone down, and this was what we most feared, for she might be resting on a single rock, which would gradually force its way through her, and it is no uncommon thing to find a hundred fathoms within a few feet of a reef in the Red Sea. I forgot to mention that the masts were cut away and went overboard with a crash, clearing everything before them.

It was now time to look about for some means of present subsistence and future relief, for we were six miles out of the course of vessels, and had therefore little to hope from them should they even pass by day. It was thirty-five miles to Mocha, on the Arabian coast, and water at least could be obtained there and a messenger despatched to Aden with the news. At the latter place there were two war steamers, the *Furious* and *Cyclops*. Arrangements were at once made, and at nine a.m. a boat was started for Mocha with a fair light wind and an almost waveless sea. There were in the boat, the second officer, Mr. Baker, (a first-rate man,) Mr. Newall, the contractor for the Red Sea Telegraph, two quartermasters, and a native crew.

I will now give in as few words as possible a kind of *resumé* of what occurred during the three days. Parties were soon formed to bring on shore everything eatable and drinkable that could be got at, and it was fortunate that some of the store-rooms were dry. A quantity of beer and claret were got on shore, and a guard established over them, and all were put on rations. This, at first, consisted of a bottle and a half for the day, but was soon reduced

to a bottle. It may seem strange to English ears to hear that this was not enough, but let them think of the heat and consequent perspiration, and that beer rather increases than quenches thirst, although it gives temporary relief. One half the quantity of water would have been more acceptable, but what little of that which had been saved was very properly kept for ladies and children. For the latter some preserved milk and arrowroot had been landed. I fancy all suffered more from anxiety for the future than from any present distress, and it was here that men's characters could be learned. Some of the "jolly fellows" of the saloon and quarterdeck looked dismal enough, and some of those who had been least popular on board became most deservedly so on "our rock."

Another boat was despatched in the evening to an island about twenty miles distant, where it was believed water could be obtained. It was in sight on the following evening returning, and I shall not soon forget the anxiety with which we hailed it when within reach, and the cheer that followed when the reply was "Water!" They had succeeded in filling all the casks they had with them, but it was very salt, and would have been spurned at any other time. A pint per man was immediately served out to every native, and the remainder, slightly dashed with rum, was very acceptable to us all. Only one died, and that was the unfortunate purser, who succumbed the first night, and expired about twelve p.m. I shall pass over two days, and resume my narrative on the morning of our relief.

At daylight a cry of "A steamer!" was raised, and passed along the rock from mouth to mouth in a second. All started up; and there, distinct enough, could be seen the smoke and even the masts of a steamer, though still far distant. It was evident that she was either coming towards us or going directly away from us, and a half-hour of sickening anxiety was passed until her hull rose slowly, and there could be no doubt that she was coming to our assistance. In two hours she dropped anchor within a hundred yards of us, and was greeted with a heartfelt cheer. The boats were lowered, and kegs of water handed ashore and devoured with astonishing rapidity, until all were satisfied, and then the ladies and children were embarked at once; and it is no exaggeration to say that had they been the wives, and sisters, and children of the gallant officers and sailors, they could not have received a more tender welcome.

It was a curious and delightful sight to see the rough but tender-hearted tars nursing and tending, and even washing children in a tub, on the forecastle, and thinking, probably, poor fellows, of their own wives and children that were far away. God bless them all! We are proud of our army, and do not hate our soldiers, but we love our sailors, for there is a charm about their rough honest nature that finds its way into every English heart, and produces a thrill of pride and satisfaction.

It was perhaps our delightful reception on board the gallant *Cyclops* that made us feel so keenly the cold and sneering one it was our fate to meet with from the passengers of the *Bombay*, and they were our countrymen too. It would be unjust to condemn all, but there were some who even indulged in open sneers, for we had lost nearly all, and our costumes were varied and curious enough, and obtained for us from the most delicate and refined on board the title of "The Alma Savages." There is another pleasant recollection to counterbalance this, and I have done. We shall not readily forget the good people of Aden. Every door was thrown open, and greater kindness it was never the lot of shipwrecked destitutes to receive: and foremost, where all were kind, were the gentlemen connected with the Red Sea Telegraph. I will now conclude this imperfect account, and trusting it will give your readers some idea of our unfortunate shipwreck, and apologising for its length, though I have not told half, I am, &c.,

Daily News. A PASSENGER.

Loss of H.M.S. "Heron."

The following is a copy of the official report relative to the loss of the *Heron*:—

H.M.S. Victory, Portsmouth, June 10th.

Sir,—Being the only surviving officer from the wreck of H.M. brig *Heron*, I have the honour to report, for the information of the Lords Commissioners of the Admiralty, my proceedings immediately before the wreck, and until my arrival on board this ship.

On Sunday, the 8th May, I had the first watch (from 8h. to 12h. p.m.) At nine o'clock the captain left his order-book with me; it ran as follows:—"Course N.E.b.N. Shorten sail on any appearance of a squall, and call me." At midnight I was relieved by Lieutenant Porter, of the *Trident*, who was taking passage and doing duty. The ship at the time was under topgallant sails, single-reefed topsails, courses, boom mainsail, and jibs; going 1.8; a fine starlight night.

At five the following morning of the 9th, I was thrown out of my bed against the main ladder. I rushed on deck, caught a rope which had fallen to leeward, and succeeded in getting on the ship's bottom, where I found a number of men. I immediately called for a knife, when Samuel Handsford, captain forecastle, cut away the foremost fall of the weather whale boat. The ship then sunk, leaving the boat afloat, the after-fall having been cut or separated, but not known by whom. Twenty-three men and myself got into the whale-boat. After being in the boat about four minutes, I saw a white speck on the water making towards us. I then gave orders to keep every one off the boat, as she was already overcrowded. When the white speck was within a few feet of the boat, I found by the voice that it was the captain, and instantly took him in; the weather at this time was very dark, and raining heavily. The captain was so much exhausted that I kept charge of the boat for about forty minutes, when he, being partially recovered, and his wounds bound up, took charge.

When daylight appeared we found the boat's crutches, and commenced pulling, keeping head to sea. After about an hour John Waldren, ordinary, said he saw a sail ahead, which was not visible to any one else, but we all saw her about a quarter of an hour afterwards, and reached her at 2h. p.m. We were then taken on board the *Irlam*, a barque of Liverpool, from Calabar to Sierra Leone, where we arrived at noon on the 16th. Captain Truscott went on board H.M.S. *Trident*, and reported himself; the *Trident's* cutter then took us out of the barque. On the 19th of May we went on board the *Ethiope*, African mail steamer, for passage to Liverpool.

On the 3rd of June Captain Truscott died, and was buried at sea.

I have, &c.,
Robert Mindry, *Gunner, 3rd Class.*

At a court-martial held on board H.M.S. *Victory*, at Portsmouth, Captain G. T. Gordon, of H.M.S. *Asia*, presiding, the following was the "Finding:"—The Court was of opinion that the loss of H.M. brig *Heron* was caused by foundering at sea in a heavy squall, owing to the officer in charge of the deck not taking sufficient precaution by shortening sail, although the squall gave sufficient warning of its approach. The Court was further of opinion that no blame was attributable to Mr. Mindry, and adjudged him to be fully acquitted.

THE "EASTERN MONARCH."—The official inquiry instituted into the causes of the destruction of this ship has resulted in a report, to the effect that the explosion arose from the "culpable and criminal negligence" of the steward, who had taken a lighted candle into the gunroom over night, and had struck a lucifer-match and thrown it down in a lighted state on the deck. The unseamanlike and disreputable conduct of the ship's company, not including the master and officers, when the fire broke out is much reprehended, and the report concludes with the following passage:—

"That nothing could be more praiseworthy than the conduct of the military officers and soldiers on board, and the comparatively small loss of life is mainly attributable to the discipline and good order of the troops under Colonel Allen. That every possible assistance was rendered from H.M. ships at Spithead, and also from the ballast barges in attendance—particularly the *Providence*, William Corderoy in charge; and by many boats from the shore."

LOSS OF THE "ELK."—An investigation took place at the Custom-house, Belfast, before Mr. W. S. Tracy and Captain Harris, Nautical Assessor, respecting the loss of the *Elk*, steamer, Captain M'Queen, on the rocks between Ballycormick Point and Groomsport. After the examination of several witnesses, Mr. Tracy said that the Court would feel it to be their painful duty to forward the certificate of Captain M'Queen to the Council for Trade; and it would be also their very unpleasant duty to express their opinion that this unfortunate occurrence, which might have been attended with loss of life, had entirely arisen from the fact that the lead was not used, and that, also, the speed of the vessel had not been slackened. These facts spoke for themselves, and the Board, on reading the evidence must see that the disaster was undoubtedly caused by these two omissions. It was, indeed, very painful to them to be obliged to come to these conclusions, after the very high and very excellent character which Mr. M'Queen had received from Mr. Watson, on the part of this great Glasgow house. The Court had now, however, nothing to do with that, but it was only their duty to forward their opinion to the Board that this disaster arose in consequence of these two omissions. It would be for Captain M'Queen to consider whether he would forward his certificates of character to the Board.

CHARTS, *&c., Published by the Hydrographic Office, Admiralty, in July*, 1859, *and Sold by the Agent, J. D. Potter*, 31, *Poultry, and* 11, *King Street, Tower Hill.*

Ireland, Lough Foyle, R. Hoskyn, R.N., 1859, (5s.)

Ireland, Achill Head to Roonagh Head, Comdr. R. B. Beechey, R.N., 1856, (5s.)

Nova Scotia, Nicomtan Harbour, Comdr. Orlebar, R.N., 1857, (3s.)

Falkland Islands, Choiseul Sound, Capt. Sulivan, R.N., C.B., (3s. 6d.)

Japan, Hakodadi Harbour, Lieut. Maury, U.S.N., 1854, (1s. 6d.)

Japan, Endermo Harbour, Mr. C. A. Stevens, U.S.N., 1854, (1s. 6d.)

English Channel Pilot, part 2, coast of France and the Channel Islands, by J. W. King, Esq., R.N., 1859, (5s.)

Hydrographic Office Notice, Africa S.E. coast, Atlas Rock and Aliwal Shoal, 1859.

Adriatic Sea, chapter i., 1859, (6d.)

United States Lights, corrected to August, 1859, by Comdr. Dunsterville, R.N., (1s 6d.)

Admiralty, July 21st, 1859.

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

SEPTEMBER, 1859.

The "Great Eastern."

When the Leviathan of the Thames refused to take to that element for which she was intended it was a cause for much regret. To many it was no doubt a very serious one. But viewing the subject in another light, that of the progress of enterprise in general, it was no less to be regretted, because the great experiment or problem which she was to solve was deferred *sine die*. Indeed, it might not be solved at all; but, at all events, a tedious delay was certain. Thanks, however, to that elastic spirit which still rises equal to the difficulty it has to surmount, our countrymen have been up and doing; and after forcing her reluctant step inch by inch into the water, here she is, ready in her proper element to proceed to her place of departure. We rejoice to see her there, and bid her welcome to commence that career in which much that is yet vibrating between hopes and doubts will ere long be set at rest.

The experiment involves naturally two questions on which success is anticipated,—the one is entirely mercantile, the other nautical. The former may be problematical; the elements of it will of course vary, but they are under certain control. Not so the latter for there may be conditions, mostly to be expected, with which her very nature may be unable to contend. What the sea has been for centuries past, it will be for centuries to come; and this, in its mildest as well as its most intemperate form, she means to brave,—to take her part in it "for better, for worse." We trust she will do her duty in it at all

times and seasons, and, like the seaman who knows his, that she will be *always obedient* to command!

But we will turn from the maze of speculations into which the vessel herself is so well calculated to lead, and look at the realities which she presented at an inauguration of the great experiment that took place on board of her the other day. There, everything was in its place,—everything was smooth and prosperous, the engines doing their duty, the screw and the paddles obeying as they should do; and we read that—"The rapidity with which her internal fittings have been completed is not the least remarkable fact in the ship's most remarkable history. Two or three months ago she was nothing but a huge shell, blank and unmeaning without, and within a scene of chaos and confusion from stem to stern. Yesterday (August 8th) she floated upon the water trim as a cutter, her five masts up and fully rigged, her noble deck smooth as a bowling-green, her tremendous engines in complete working order, and her spacious saloons invitingly ready for the very numerous company who partook of the hospitality of the directors. In the interval which had elapsed since our previous visit the progress made by the contractors was miraculous; and here we may mention that having given to Mr. Scott Russell the lion's share, the remainder of the credit must be divided between Mr. Parry, who supplied all the movable internal fittings, Mr. Crace, who decorated the great saloon, and Mr. Finch, of Chepstow, the last-named having supplied three out of the five masts with which the vessel is rigged. These three masts are of iron, and if they work as well as they look will be of very great advantage in the sailing of the ship.

The whole of the deck is now completely laid, caulked, and polished, and no description can realise the effect of its vast size upon the visitor when first he puts his foot on its polished surface. Capstans, binnacles, galleys, windlasses, are all in their places; the completed bulwarks rise breast high all round the ship, and the skylights enable the spectator to look down into the cavernous engine-room, and see probably the greatest mechanical power in the world in easy experimental motion. The engines were tried, the screw working one way and the paddle the other, in order that the vessel might not be disturbed from her moorings, and the result met with the unqualified praise of all the scientific persons present. In fact, they worked as easily as if they had been two years in use, and left little doubt on the minds of those who witnessed their performance that the promised twenty miles an hour would be a comparatively easy achievement.

The deck having been duly explored the company crowded down the principal staircase, and were soon astonished with the elaborate splendour of the grand saloon, on which Mr. Crace has exhausted all his well known proficiency in Renaissance decoration. Much skill has in the first place been shown in making the best of the masts and funnels, obstacles which could not be removed, and which in less skilful hands would have very much obstructed the view, and spoiled the general effect of the saloon. But Mr. Crace has squared these un-

sightly objects, and covered them with large and costly mirrors, so placed that instead of contracting the view they give the effect of much greater space than is really available. The sides, and all spaces not occupied by looking-glasses, are covered with a peculiarly rich white and gold paper, with massive Renaissance cornices, and interspersed with panels painted with allegorical subjects. The floor is covered with crimson Axminster carpeting of the royal pattern, and the recesses are all filled with couches covered in crimson Utrecht velvet. The hangings are of the most superb tabaret of the same colour, fringed with silk lace and looped up with tassels of the newest design; and, in short, everything gives the idea more of the state reception-room of a royal palace than the principal cabin of a merchant ship. A very peculiar feature in this unique saloon is the mode by which it is lighted and ventilated at the sides—by large openings railed off with gilt balustrades, and reaching to the upper deck, where they are met by skylights, which can be left up or down at pleasure. Besides the great additional light which these openings give, they are invaluable as securing at any moment currents of fresh air, a luxury which will only be fully appreciated when the *Great Eastern* is steaming majestically across the Indian Ocean with her living freight of some eight or ten thousand passengers for Calcutta.

Next to this imperial saloon is another and still longer one, which is to be appropriated to the ordinary first-class passengers, the other being exclusively devoted to the extra first and the ladies, and in which the directors entertained some 600 of their friends. Arrangements had been made for 350, but the thirst of the British public for scientific investigation, especially when a champagne luncheon crowns the vista, brought down such troops of friends, that entertainment had to be found for nearly double the number. Thanks, however, to the prevision of Mr. Quartermaine, of the Ship, to whom the commissariat had been entrusted, there was enough and to spare for everybody, and the wines were always ready in abundance when some noble, commercial, or patriotic sentiment required to be toasted.

Around these two principal saloons the sleeping berths of the passengers are skilfully arranged, the amount of accommodation being regulated, of course, by the price paid for the passage. But it is hardly fair to call them mere berths, seeing that they are, generally speaking, rather suites of apartments, comprising sleeping, sitting, and dressing rooms, all self-contained, and offering to females as complete seclusion as if they were in their own homes. The smallest of these berths is larger than the best cabins in any other vessel; and they have the peculiar advantage of being at least double the height, and possessing the most ample and ready means of ventilation.

We believe it is hardly yet settled where the first experimental trip is to extend to, but the general rumour on board was that the ship will first proceed some three or four hundred miles out to sea and return, without any person on board save the captain, officers, and crew; that on her return she will steam down to Portland, and if the weather should be very fine, cross over to Cherbourg, in order to give

our French neighbours the opportunity of sharing in the pleasure which all Englishmen unfeignedly feel in the completion of the great ship. Ultimately her destination is said to be Portland, in the United States."

In all the foregoing, glowing as it does with the enthusiasm of the reporter of the *Daily News*, we are quite as hopeful of success as he is. In all that man can do in such a case he is pretty sure to do that well, leaving the rest to time and the elements, for the "Prosperity of the Great Ship," the toast proposed by Lord Stanley at the reception given on board to the visitors of the Leviathan, and who is said to have alluded to the "expectations" and "intentions" which led to the great experiment about to be made nearly as follows:—

"It would be impossible to pass over so conspicuous an occasion as the present without making some attempt to express what he was sure they all felt respecting the beautiful vessel, her management, and the zeal and enterprise of the company by whose exertions she had been brought to her present state of maturity. They all knew that the building of this gigantic ship was an undertaking which had been watched throughout its progress with the deepest anxiety, not merely by the few who had a material interest in its prosperity, but by every man who took an interest in the commercial greatness of England, and every intelligent and thinking man throughout the civilised world.

He supposed that most of the company whom he then had the honour of addressing knew the work which the ship was intended to do, and what particular qualifications for doing it she was intended to possess. It was expected that she would make the voyage to Calcutta in thirty-two days, carrying coals enough to last her the whole voyage out and home, and thus sweeping away at once the long catalogue of delays and defects which at present were found to be so burdensome and obstructive to the full development of steam navigation. She would contain a population of nomadic English men and women of not less than ten thousand in number, for whom not only the comforts but the luxuries of the best arranged establishment at home would be amply provided. If the experiment succeeded—and they were aware that nothing had been or would be left undone which the most untiring energy, and the most complete mechanical skill, could accomplish to secure its success—if the experiment succeeded, through the most unexampled perseverance and in spite of extraordinary difficulties—and in that room it would be impossible to doubt its success—it would prove to be the greatest improvement and the mightiest revolution in the art of shipbuilding that had ever taken place in one stride since man first ventured from the security of the land, and began to traverse the sea. It would accomplish these grand results for civilisation and human enlightenment that it would diminish by one-half the distance which at present divided continents and nations which nature had imperiously separated by an intervening ocean, but which science and trade were gradually bringing together, as it were, in spite of nature. If it succeeded it would

render the passage to distant countries, and over stormy seas, as easy and as free from discomfort or danger as an ordinary railway journey by land. It would give to commerce a stimulus and a development hardly possible in the present state of steam navigation, but, above all, it would enable us, if unhappily the necessity should arise, to pour reinforcements of troops into our great Indian empire with a rapidity quite equal and a facility much greater than that offered by the overland route, besides giving us a line which would be wholly independent of the friendship or enmity of any other power. It would do more, he did not say that it would quite solve that great political problem of our time, which was known as the Eastern question, but at least it would render the solution of that problem a matter of much less practical importance to England than it was at present. It was universally acknowledged amongst English statesmen, that the principal interest—indeed he might say the sole interest—which we had in Egypt and the countries adjacent arose from the fact that they enabled us to carry on more rapidly our intercourse with India. Here we were offered a means of communication equally rapid, but by another line, and the result must be that the overland route must be virtually superseded.

So much for the undertaking. As for those who had carried it out, his hearers were aware that their course had not been one of unbroken prosperity and success. There had been a time of difficulty, of despondency, and of doubt, and when even total failure seemed more than probable. At that time Mr. Campbell and his fellow-directors undertook the management of the concern. They brought their knowledge to bear, their intimacy with commerce and its requirements. They brought to bear all the resources of science and of the highest mechanical skill; the capitalists of England placed confidence in them, and the result was what they saw around them at the present moment."

One result it is evident from the foregoing is accomplished—the great ship is ready to do her work; and her sponsors at her entry into life have promised for her that she shall realise all the expectations formed of her,—that she shall transport her tens of thousands with wonderful rapidity, ease, and facility, *if she succeeds.* We are, in fact on the brink of a revolution in maritime commerce if she succeeds, and the Peninsular and Oriental Company and their overland route are then to become matters of history! But the noble science of naval architecture dispenses with the little monosyllable, and the question of success will be fairly answered with either "yes" or "no," and for one of these replies there is no doubt that "every thinking man throughout the civilized world" is waiting with anxious expectation, not excepting, perhaps, even the Directors of the P. and O. Company!

Note.—Our two last volumes will supply abundant accounts of her.

Temperature of the Sea around the Coasts of Scotland in 1857 and 1858.—*By James Stark, M.D., F.R.S.E., &c., &c.*

(Continued from page 414).

The circumstance of wrecks and West India seeds being carried to the shores of Britain and Norway, admits of an equally easy explanation. Every current or stream of water has a natural tendency to throw to its margin objects which are floating on its surface. We see this in rivers, and in every stream; and it is not, as Mr. Maury supposes, in consequence of the surface of the current having a "roof shaped" surface, but simply by virtue of the known law that the resistance of friction being least in the centre, the current is quickest there. The water in the centre of the current thus acts the part of a wedge, and necessarily throws bodies which are floating on its surface to either side. Seeds or wrecks, therefore, floating in the Gulf Stream, or carried forward to that stream by the equatorial currents, may be deposited in the Grassy Sea if thrown off on its southern edge, but if carried to its northern margin, and especially if aided by the prevalent S.W. wind, they pass from the Gulf Stream to the Arctic Current, and, according to the power of the wind on the floating body, they may either be landed on the French, English, Irish, or Scottish coasts, or may even be carried onward to Norway. The effect of the prevalent wind on a floating body, even when that body is wholly covered with the water, is much greater than is usually imagined. When the wind blows over the water, it ripples the surface, so that at every ripple the solid body (as a floating seed) receives on its side the full force of the wind, and therefore moves through the water in the direction of the wind faster than the current in which it is floating. This is unquestionably the explanation of the conveyance of African, West Indian, and American seeds and wrecks to our shores, aided no doubt, as these must have been, at first by the currents.

Every known fact, then, can be explained on the supposition that the course of the currents in the Atlantic is such as I have described them; but many of the facts are quite opposed to, and cannot be explained by, the theories of Mr. Maury and those who hold that the Gulf Stream flows to the shores of Great Britain.

But one fact, ascertained during the two past years, appears to me to settle the question as to which is the correct theory. During the summer months it is asserted that the Gulf Stream is more voluminous than during winter; so that during summer and the beginning of autumn the Gulf Stream encroaches more on the great Newfoundland Banks; and, of course, if Mr. Maury's theory were the true one, it would send to Britain, during these months, a much larger supply of hot and salt water than when its waters were lower. During summer and autumn, therefore, the seas on our western shores ought to be of greater density than they are during winter,—an effect which would be heightened by the natural evaporation which takes place from our seas during the summer months. The reverse, however, was found

by Captain Otter to be the case. In the Sound of Harris, far from all rivers, he found that during the summer and autumnal months, the density of the water was less than during the winter months. Thus, during the summer and autumnal months he found the density of the water only 9, equivalent to a specific gravity of 1025 to 1027; whereas, during the winter months, the density was 10, equivalent to a specific gravity of from 1028–1030. Mr. M'Donald's observations, though not taken at such a favourable position, confirm Captain Otter's results, so that there seems to be no reason to doubt the fact. The density of the water in our bays or close to the shore would only lead to false conclusions on this point, seeing that the fresh water from our rivers renders the water lighter during winter.

The greater freshness of the waters of the Atlantic on our western shores during summer and autumn is easily explained according to my theory of the currents in the Northern Atlantic, but is quite inexplicable on the supposition of the Gulf Stream flowing to the shores of Britain. If it be the Arctic Current, coming up on Rennell's Current, which flows past Britain, then so long as ice is melting in the Arctic regions, so long will the water which reaches the shores of Britain be somewhat fresher than the waters of the surrounding ocean. But the moment the supply of ice fails, from the Polar Seas being again frozen over, from that period will the seas on our western shores recover their usual saltness.

One other argument tending to the same conclusion has yet to be adduced. Mr. Maury, in his *Physical Geography of the Sea*, says:—"There is at the bottom of the (Atlantic) sea, between Cape Race in Newfoundland and Cape Clear in Ireland, a remarkable steppe, which is already known as the Telegraphic Plateau." On examining the sand or mud brought up from this plateau, it was at first found to consist almost entirely of minute microscopic shells, foramaniferæ, and diatomaceæ, from which Mr. Maury drew the conclusion, "that there, if anywhere, the waters of the sea are at rest. There was not motion enough there to abrade these very delicate organisms, nor current enough to sweep them about and mix them up with a particle of the finest sand." In his Appendix, however, he adds some further facts relative to this mud from that plateau. When examined by the microscope with greater care, it was found to contain also fine volcanic dust, which Professor Bailey describes as "glassy obsidian and minute fragments of pumice," which "has usually sharp angles, and is such as might be dropped from icebergs as they melt." Of course the presence of such peculiar volcanic dust or ashes cannot be explained by Mr. Maury according to his theory of the Gulf Stream passing over all this plateau on its way to the northern seas. But, according to the view of the currents just propounded, the deposition of volcanic dust on this plateau could have been predicted, and, moreover, that this dust would get finer and finer as it approached Ireland, which, so far examined, it certainly does. This plateau, according to my theory, marks very nearly the northern limit or edge of the Arctic Current, which in its passage past Iceland carries along with it ice containing

the very peculiar volcanic ashes of that island. These volcanic fragments on the Newfoundland Banks are very distinct. Some of the finer particles are, however, carried along with the Arctic Current as it crosses the Atlantic towards Western Europe, and hence their occurrence on this plateau.

But, it may be said, the Gulf Stream water, or at least water somewhat above the temperature of the surrounding ocean, has been once met with during winter so far North as the Bay of Biscay, and on another occasion out at sea opposite the Straits of Gibraltar. Such an occurrence, however, is quite consistent with the theory of the currents as just propounded, without considering that that water was furnished by the Gulf Stream. Every one knows the power of the wind to excite a current when it blows continuously over a surface of water. But we do not require to go further than the Gulf Stream itself to prove the fact. During summer and autumn the volume of the Gulf Stream is considerably larger than it is during winter and spring. This is a well ascertained fact. Now, how is this? During summer and autumn the N.E. Trade winds blow over a much greater breadth of the North Atlantic Ocean than they do during winter, when, in consequence of the sun being to the South of the equator, they are confined to 15° or 20° North latitude. During summer, therefore, a much larger and broader surface of water is set in motion by these winds, and the Equatorial Current, which is the true source of the Gulf Stream, is consequently much more voluminous during summer than it is during winter. But during winter the principal wind over the North Atlantic is the S.W. wind; and, as during winter it blows over a very large extent of the Atlantic, if it blows with any strength at all, or continuously, it drives before it, or carries along with it, a superficial current of warm water from the hot Grassy Sea. If this hot layer of water be once thrown over any portion of the Arctic Current, it may be carried to any part of Europe reached by that current; or if the wind be sufficiently continuous, that heated water may be carried continuously forward in the line of that wind. This is unquestionably the explanation of the fact of Franklin having encountered a surface current of hot water in the Bay of Biscay, and General Sabine having found a similar layer out at sea off the Straits of Gibraltar. Both occurred in winter when the S.W. winds are strong, and are the prevalent aerial currents.

Great misconceptions exist as to the difference of temperature between the waters of the Gulf Stream and the waters of the surrounding ocean, or that of the Arctic Current when it meets that stream at the Banks of Newfoundland. The difference of temperature between the Arctic Current and the Gulf Stream when they encounter each other, varies from 6° to 10° Fahr. only, seeing that as the Arctic Current flows southwards, it is continually acquiring heat. Thus, though in the Wellington Channel its temperature is only from 32° to 33° Fahr. in September, it has increased to 46° Fahr. by the time it has reached the latitude of 60°, that is the South point of Greenland; and before it reaches the South of the Great Newfoundland Bank, its

temperature has increased to from 58° to 65°, the Gulf Stream at the same point being usually about 70°. In spring, however, when the temperature of the Arctic Current is lowered by the quantity of icebergs brought down with it, its temperature is often 20° below that of the Gulf Stream. As the Arctic Current, however, crosses the Atlantic, it acquires additional heat, *bringing its temperature to the normal heat of the latitude before it reaches the European shores.* All that portion, therefore, which flows northward along the shores of France and Britain, and onwards to Norway, is higher in temperature than is due to the latitude, and as the current comes from the South, it encourages a marine vegetation, approaching what we should expect farther South. It is this warmer current from the South which keeps open the western harbours of Norway during winter. That portion, however, of the Arctic Current which flows to the South along the African coast, as it is constantly flowing into a warmer region, has a temperature somewhat lower than that of the surrounding ocean; but after all, the difference is only from 5° to 10°, depending on the season of the year and the place of observation.

One other argument for the truth of the theory now propounded, relative to the currents of the Atlantic, is derived from the known habits of the leviathans of the deep. All naturalists are aware that a curved line drawn from Cape Hatteras in America to the island of Madeira, the top of whose arc shall touch the southern extremity of the great Bank, separates from each other two of our largest mammalians—the whalebone and the spermaceti whale. These animals differ entirely in their habits, and in the kind of water in which each delights. The true or whalebone whale is never met with but in the cold water, but it comes down with the Arctic Current, and may be encountered wherever that current occurs, so that it is met with as far South as off New York on the American coast, and comes down even to Madeira, on the eastern side of the same ocean. This animal, so far as known to me, has never been met with in the hot waters of the Gulf Stream. The limits of the Arctic Current are therefore its limits southwards, and the line which marks these limits is also the limit of the Gulf Stream northwards. The spermaceti whale, on the other hand, is alone found in the warm waters of the ocean, and never ventures into the colder Arctic Current; and as neither of these animals has been observed to cross the curved line above indicated, it is a tolerably strong argument in favour of the Gulf Stream waters reaching no farther North.

From what has been said, then, it will be seen, that no known fact is contradictory of the theory just stated, relative to the currents in the North Atlantic, or to the course of the Gulf Stream, and its want of influence on our island. On the other hand, many of the ascertained facts are irreconcilable with the theory that the Gulf Stream flows to the shores of Britain, and the Northern or Arctic Seas.

Mr. Maury's theory of the Gulf Stream's course being directed by the rotation of the earth on its axis, is irreconcilable with the known

fact, that when it issues from the Gulf of Mexico, it does not follow such an eastern course, but doubles back upon itself, to sweep in a *north-westerly* direction round the curved coasts of Florida. That theory of the rotation of the earth on its axis, directing the course of the currents, is irreconcilable with the *south-easterly* course of the Arctic and North African Currents, and with the *north-westerly* course of the Equatorial Current. The theory of the Gulf Stream flowing direct for the North Seas, is irreconcilable with the fact, that a bottle, thrown out from the *Hecla*, in Davis Straits, was landed at Tenerife; and is also opposed to many of the facts proved by Becher's bottle chart. That theory is irreconcilable with, and will not account for the difference in climate during winter between Britain and France; for, by that theory, both these countries would be equally under the influence of the Gulf Stream waters. That theory is irreconcilable with the now established fact, that even the variations in the temperature of the air and of the sea in Scotland, both during summer and winter, have the closest accord with each other; which that of the sea could not have, were its temperature dependent on the influx of warm water from the Gulf Stream. That theory is irreconcilable with the fact, which every ship's log proves, that in crossing the Atlantic from Britain, the warm waters of the Gulf Stream are never met with, but when the ship is sailing over, or to the South of the Newfoundland Banks, and passes through the loop which the Gulf Stream forms there, and is come suddenly upon at that point, and is as suddenly left as the ship nears the American shores. That theory fails to account for the fact, that the current which flows from the Atlantic into the Mediterranean Sea through the Straits of Gibraltar is not salter, nor of greater density, nor of higher temperature than the ordinary waters of the ocean, which it would be, were it supplied by the Gulf Stream. That theory is irreconcilable with the fact, that the waters on our western shores are, during summer and autumn, of less density than they are during winter. That theory fails to explain how the heavier and salter waters of the Gulf Stream could float over the somewhat colder, but much fresher and lighter waters of the Arctic Currents and Northern Seas. That theory virtually ignores the existence of Rennell's Current; and both ignores the existence of the North African Current, and fails to give any explanation of the long ascertained fact, that the temperature of that North African Current is from 6° to 10° colder than the waters of the surrounding ocean in the same parallel of latitude. That theory will not account for the existence of the great elevated telegraphic plateau between Newfoundland and Ireland, nor for the existence of volcanic ashes on that plateau identical, in so far as yet examined, with those from Iceland. That theory will not account for the fact, that vessels in their course to and from America, if they sail over the telegraphic plateau, or within what I have described as the limits of the Arctic Current, never encounter the hot water of the Gulf Stream, except when crossing its bend South of the Banks of Newfoundland, and thus

avoid that corrosion of their coppers, which the researches of the Secretary of the United States navy prove to occur, when they sail in the hot and salt waters of the Gulf Stream; for by that theory they would be sailing in the hot waters of the Gulf Stream during their whole voyage. That theory fails to explain the fact known to all naturalists, that a curved line carried from the Island of Madeira to Cape Hatteras, touching with the upper part of its arc the southern extremity of the Great Newfoundland Bank, marks the limit southwards of the true whalebone whale, and the limits northward of the spermaceti whale. And, lastly, that theory which makes the climate of our island and the temperature of our seas to be dependent on a supply of heated water from the Gulf Stream, fails to account for the fact, that the mean temperature of air, land, and sea in Scotland, is nearly the same; and that their fluctuations in temperature, both during summer and winter, show a marked accord with each other.

This whole investigation, then, leads to the conclusion—indeed, seems to me to prove—that the climate of Britain is in no respects influenced by the heated waters of the Gulf Stream, which do not approach our island within thousands of miles. It also confirms the conclusion to which the consideration of the other facts previously stated lead, that the mildness of the winters in Britain is chiefly due to the S.W. or anti-trade winds, which are the prevalent aerial currents in this latitude during winter. These winds, originating during winter about North latitude 15° or 20°, blow direct to us over the level Atlantic Ocean, bringing with them much of the heat and moisture they had acquired during their passage over the great expanse of the heated waters of the Sargasso Sea and Atlantic Ocean North of it.

It is because no other country in the globe is similarly situated with regard to such winds that no other country in a similar latitude enjoys such a mild winter climate. Labrador, from its geographical position, must be very much colder. It is in the region of the S.W. winds; but in order that they may reach it, they have to traverse the whole breadth of the American continent, where they lose both their heat and moisture on the high mountain ridges they have to cross; so that these winds carry to that inhospitable country only cold. The same agencies are at work in Newfoundland and Nova Scotia; and though these countries are but a very short distance from the Gulf Stream, they so little experience any benefit from it, that their winters are very severe, and more intense than is ever likely to be experienced in this country. It is the very same agency which causes the eastern counties of the United States, even below the latitude of New York, though they have the Gulf Stream not very far from their shores, to suffer from a winter's cold much more severe than is ever experienced in these favoured lands.

But, in fact, the greater severity of the winters in France, though so much further South than Britain, is a standing proof of the correctness of the theory now proposed. If the S.W. winds reached France uncooled, its temperature during winter would more than equal

that of Britain. But France lies far back, having the whole peninsula of Spain interposed between it and these balmy S.W. winds. These winds, therefore, before they reach France, are thrown upwards and are chilled by the mountain ridges of Spain, so that they descend on France as partially cold winds; and as that country has no other agency capable of driving back the winter's colds, she has a winter temperature considerably below that of Britain.

P.S.—Much of the fallacies regarding the oceanic currents are founded on the mistaken idea that the currents from the tropical seas must restore to the polar and other seas as much water as these polar and other currents bring down to them (Maury, § 401, p. 149). This is a complete mistake. The intertropical seas are the great evaporating basins of the world; and it may be safely assumed that the greater portion of the water brought into these regions by the polar and other currents is removed by evaporation in the form of vapour. This is especially the case with the North Atlantic. The Gulf Stream does not nearly represent the mass of water contained in the Equatorial Current, which is its true source, and it diminishes rapidly by evaporation as it flows onwards. Few have any idea of the amount of water raised from the sea by evaporation. From repeated experiments, conducted with much care, during summer, it was ascertained that a square foot of sea-water, of the density of 1025 (water of Firth of Forth), lost by evaporation 3379 grains of water every forty-eight hours, when exposed in a room where the air was perfectly still, and the temperature nearly steady at 62° Fahr. The water was renewed every second day, as by that time its density had sensibly increased. When a current of air was allowed to play over the basins of water, the evaporation was greater. As the air, however, is never absolutely calm over the ocean, and as the mean temperature of the intertropical seas is much above 62°, the evaporation must be much beyond what these experiments indicate. Nevertheless, these experiments show that, were the air still and the temperature 62° Fahr., every square mile on the surface of the ocean would lose *daily* by evaporation no less than 3287 tons 17 cwt. 100 lbs. and 353 grains of water. If, even with these data, any one will take the trouble to make the calculation, he will find that the loss of water by evaporation from the immense expanse of the North Atlantic, within and somewhat beyond the tropics, is such that it would require the whole supply of the Equatorial Current, and no small portion of the Arctic Current, to supply that loss, without leaving one drop of the Gulf Stream to spare for any counter-current to the Polar seas.

Navigation of the Pacific Ocean.

(Continued from page 432.)

During the westerly monsoon the wind generally hangs to the northward and N.W. about the Cape of Good Hope of New Guinea. East of this cape fresh westerly winds are found, with an easterly current of two or two and a half miles an hour. This current, extending between the coast of New Guinea and the equator, runs through the Caroline Archipelago, and without fear of losing the breeze or the current a vessel may pass near the islands of St. David and North of Providence for whichever passage may be preferred to cross the archipelago, and steer southward after gaining the West winds of the temperate zone.

The eastern part of Dampier Straits, although the most direct for a vessel going to Sydney, is not the safest. The best route for reaching the St. George Channel will be to keep the equator until the meridian of the Admiralty Islands be gained; then to steer S.E., so as to pass between this group and St. Matthew: a route by which the low islands and reefs may be passed without fear during the night.

The other route, North of the Solomon Islands, appears to be the best for vessels going to New Zealand, the Feejee Islands, or otherwise to the eastward.

A ship bound to New Zealand should not cross the parallel of 10° S. before reaching the meridian of 170° or 172° E. She would then run to the southward along the western side of the Feejee Islands, keeping near them, for the easterly winds extend very far South during the months of January, February, and March; and, provided she passes to windward of the reefs off the South point of New Caledonia, she may keep this route for the southern zone of variable winds.

Having reached New Caledonia or New Zealand, a quick passage may be made to the coast of America with the assistance of the westerly winds found South of the parallels of 28° or 29° S.; which, indeed, in some degree, may be considered as general winds, from their prevailing in those parts. It is not unlikely that this route will eventually be generally taken by vessels in all seasons from China or Manila to South America, especially when they have good charts of the Western Pacific.

Port Jackson or Tasmania to America.—The latter part of the above route from China to the coast of America during the N.E. monsoon may be also adopted for going from Port Jackson or Tasmania to South America or for Europe by Cape Horn.

Several vessels have made the passage from Port Jackson to Staten Island in forty-six days. Freycinet in thirty-eight days made the passage from Tasmania to Cape Horn,—being from December 29th to February 4th,—by running between the parallels of 48° and 58° S.; and, with the exception of a single day, when the wind was from S.E., during the whole of the voyage they varied from N.N.W. to S.S.W. by the West. The currents constantly flowed to East and N.E.

at a maximum rate of seventy miles in twenty-four hours, and never less than four, but at a general rate of twenty-two miles a day.

When this route is taken for passing Cape Horn it must not be forgotten that summer is the most favourable season for leaving the Pacific, and principally during the months of January and February, although this passage is in general so easy and short that it may be taken at all seasons of the year.

It may be observed on this subject that small vessels, if they choose, have the advantage of using the strait of Magellan for leaving the Pacific Ocean, especially since the charts and directions for it have been so greatly improved. But at the same time, if they do so, there must be, says Captain King, a decided advantage to induce the navigator to decide on taking a succession of channels while he has an open sea and a fair wind before him. On leaving the strait of Magellan, the winds being westerly, and generally either North or South of West, they are favourable for coasting; and, in case they should not be, a ship is not exposed, as in the outer route, to a heavy sea,—so inconvenient to a small craft,—for near the American coast the sea is comparatively still. But the ship which has doubled Cape Horn, if the wind is from N.W., should run East of the Falkland Islands, and is there exposed to heavy breezes and a violent cross sea; in addition to which to make northing a ship is obliged to keep her wind, which exposes her to heavy and dangerous seas. Hence, it would certainly appear that there is a decided advantage for small vessels to adopt the passage by the strait of Magellan.

The principal routes here defined are sufficient to give a general idea of the mode of crossing and recrossing the Pacific. According to the port of departure and destination, the route can be modified.

From India to East Australian Ports.—From routes given in the work on the Indian Ocean it will be easy to decide on that to be taken from India to Port Jackson. There are, however, yet two to be mentioned: one, the North route to Torres Strait, which should be taken from the beginning of September to the end of March, the period of the N.W. monsoon in these latitudes; the other, the southern route, by rounding Australia to cross Bass Strait, is taken from March to September, when the S.E. monsoon prevails in Torres Strait.

In the southern route from any port in the northern part of the Indian Sea the principal object is to gain the Trades as soon as possible, to cross them quickly by an oblique route, approaching the western coast of Australia, and then run along the South coast to Bass Strait.

From the Cape of Good Hope, a ship crossing the Indian Ocean would take the same route as that for China by the Great Eastern Passage. By the Great Eastern Passage, to which we allude a ship may enter the Pacific, first, by passing South of Tasmania; second, by crossing Bass Strait.

Passing South of Tasmania.—When taking the route South of Tasmania, often dangerous and longer than that by Bass Strait, a vessel from the westward would run on the parallel of 39° S.; when in 130° E. long. she would steer so as to pass South of Tasmania to

gain the meridian of 144° E. before making the land, and being cautious not to fall in with it at night, by anticipating the effects of current or any error in the reckoning by drift or otherwise. When rounding the South cape, unless a vessel is bound to Hobart Town, she should keep at a distance of at least twenty-four or thirty miles from Cape Pillar and the eastern coast of the island, so as to avoid the variable winds and calms, which will otherwise place a vessel in an awkward position, while out at sea there is a good breeze. This is particularly necessary during summer, when easterly winds are common and on the eastern coast of Tasmania, as well as Australia, there is a N.E. current of about a knot an hour, extending out to twenty leagues from the land; but within seven leagues from the coast a counter-current to this sets in the opposite direction at about half that rate.

Route by Bass Strait.—A vessel intending to enter the Pacific by Bass Strait, having gained the meridian of about 135° E., should keep on the parallel of King Island, to avoid being set to leeward by the S.E. wind, which should always be guarded against in the bay West of Cape Northumberland; as well as being set to the southward by the strong N.N.E. winds always met with West of Tasmania between the parallels of 40° and 44° S.

Coming from the westward for Bass Strait, the coast of Australia should be avoided, being dangerous with southerly winds, and affording no sheltered anchorage against them. The S.W. and southerly winds must be specially guarded against, and during the period when they prevail a vessel should not be to the northward of the parallel of 40° S. until within forty leagues of King Island.

If the wind has a tendency to veer northerly and circumstances be favourable for sighting the coast before night, it will be better for a vessel entering the strait, and uncertain as to the land, to steer so as to reach the coast on the meridian of 143° E. On this meridian there are several high white rocks, forming a considerable projection on the coast, and there appear to be no dangers near them at a distance of a mile and a half or two miles from the land.

The western entrance of Bass Strait is between the islands near the N.W. point of Tasmania and Cape Otway of Australia. It is thirty-six leagues wide, with King Island nearly in the middle, and occupying about twelve leagues of it. North of this island is a passage fifteen leagues across; and another to the South only twelve leagues wide, in which there are many dangers, and is only taken in a case of necessity.

Approaching the strait from West a vessel should endeavour to sight the land about Cape Otway, the lighthouse on it rendering it very remarkable. Should the weather prevent this the vessel may know she is in the direct route for the strait by having soundings of sixty fathoms, grey sand. The same depth with a rocky bottom will show her to be too far South and off the West coast of King Island, with its rocky and very dangerous coast.

A vessel certain of her position at the entrance of the strait should

steer for Curtis Island, which is seen from the deck in fine weather at a distance of ten or eleven leagues. The distance from the entrance of the strait to this island is forty or fifty leagues, and, as there are no dangers in the way, with a good look-out part of it may be run over during the night. Passing South of Kent Group at a distance of six miles or more from Deal Island, which is the largest, an E.N.E. course may then be shaped or that course adopted nearest to it, according to the prevailing wind, so as not to get too far to the northward near Long Reach.

The foregoing are the directions of Captain Flinders; since they were drawn up, the channel South of Kent Group has been found so full of rocks, difficult to make out even in fine weather, that the best route to follow is that between Kent Group and Wright Rock or between Kent and Hogan Groups, leaving Curtis Isle to the northward. The Crocodile Rock, between this island and the isle of Medondo, is thereby avoided.

The tides off Wilson promontory are too rapid to render it advisable to approach it without a strong breeze. In the event of a S.E. gale, the position of a ship in its neighbourhood would be no less bad after having weathered the chain of islands at the entrance of the strait as after having cleared one of the channels more to the southward.

Anchorages in Bass Strait with the East winds.—The most convenient places for anchoring in the strait when bound eastward, are:—

1st.—Franklin Bay, on the N.W. point of King Island, sheltered from the sea by the New Year Islands, and where there is tolerable protection from easterly winds.

2nd.—Port Phillip. The anchorage is just inside the entrance on the South side of the port: with a favourable wind a vessel can leave it with the tide, which is very strong.

3rd.—The Hunter Islands, where a vessel should anchor between the Three Hummocks and Hunter Island, taking care not to be too near the weather shore, in case the breeze should suddenly change.

4th.—The bay between Wilson Promontory and Cape Liptrap; to be adopted only in case of necessity, for it is an unsafe anchorage, particularly with S.W. winds, which blow strongly.

5th.—Kent Group; convenient for small vessels, which may anchor in one of the little sandy bays East of the islands.

6th.—Furneaux Group, anchoring between Clarke and Preservation Islands. A vessel leaving this anchorage, if she cannot double Clarke Island and obliged to pass S.E. of it, when the wind admits should cross Armstrong Channel, sending a boat ahead to keep her clear of dangers. The entrance of the strait between King Island and Hunter Group should not be generally taken, on account of the several rocks in it. A ship obliged to cross it should pass South of Reid Rock; keeping near the black pyramid with it N. 53° E. will clear the Bell and Conway Rocks. With a steady fair wind a ship may pass between King Island and the Reid Rocks; in which case she should keep near the shore of the island, and allow for the current which sets strongly across the strait. But Reid Rocks always break.

From China to the East Coast of Australia.—Leaving Canton in the S.W. monsoon for the East coast of Australia, the shortest route in general is the eastern one. Entering the Pacific by the strait of Formosa, a ship would then make her way eastward and cross the N.E. and S.E. Trade winds obliquely, and so as to find herself East of the port of Australia to which she was bound, then gaining its parallel. This route has no other difficulties than those common to navigation amongst scattered islands of the Pacific.

The same route, on the contrary, will be dangerous and more tedious in the N.E. monsoon, for the strait of Formosa must be left for the Pacific, working to windward in order to gain easting and northing through the N.E. Trade winds, for the variables North of 30° N. lat. On leaving the strait of Formosa a vessel should always take the shortest route for clearing the Trade winds. In general, a ship should gain as far as 165° E. before going South.

During the N.E. monsoon, namely, from September to February, instead of taking this route it will be more advantageous to keep in the China Sea; by which bad weather will be avoided and a quicker voyage made. After passing East of the Great Natuna, the Carimata Channel would be taken, and then the East point of Madura would be steered for, the ship passing between the islands of Pondy and Galion if intending to take Bally Strait. Lombock, however, is better and so is Allas Strait. Having cleared the straits, the ship would work in the Indian Ocean, profiting by the changes in the wind, which at this season are generally from S.S.W. to S.S.E. between the northern limit of the Trades and the eastern straits. Westing must then be made to cross the Trades for the variable winds of the Southern hemisphere, with which easting will be rapidly made. In March and April Bass Strait may be taken, or by preference the route South of Tasmania, on account of the easterly winds which prevail in the strait during these two months. In all other months Bass Strait should be taken as the shortest route.

From East Coast of Australia to India, Southern Route.—Leaving Sydney or ports on the East coast of Australia for India or Europe, a ship may take Bass Strait, or round the South coast of Tasmania, if she does so between the commencement of September and the 1st of March. In January, February, or March S.E. winds are found near Tasmania more commonly than in any other month. These winds may be advantageous to make westing, but it is necessary to keep at a good distance from the Australian coast, so as to profit by every change of wind and not to be thrown ashore by a breeze from S.W., which is frequent at this season.

Vessels going to Europe have also taken this route during the winter months of this hemisphere (June, July, and August); it is true that bad weather renders it very disagreeable, but not impossible to adopt even in this season.

As soon as possible the ship should gain the zone of the Trade winds of the Indian Ocean, and having done so should take the proper

route for her destined port. The passage is made under favourable conditions from Sydney to Bengal in two months; vessels have occupied fifty days on the passage from Sydney to False Bay, and it is in the summer months, October, November, and December, that the best passages are made.

Passage of Bass Strait from East.—The entrance of Bass Strait is the space comprised between Wilson Promontory and the N.E. cape of Tasmania. Between these two capes there are a great number of islands of granite rock, forming a chain extending about forty leagues.

The winds are generally favourable for the passage of the strait from East to West and for coasting in January, February, and March. Easterly winds are seldom found at any other time; they come in squalls, and generally end in a breeze from the opposite direction, having much of the rotatory character. The gales of the strait commencing at N.N.W. draw gradually to and end at S.W. If the wind at West before having become S.W. returns to the northward of West, the squalls will still continue; but this the barometer will perfectly indicate. It seldom clears up when the barometer falls to 29·9 in., and bad weather is certain when it marks 29·65.

We may here observe that during the three months abovementioned when the passage of Bass Strait from East to West is the easiest, it is dangerous (not to say impossible) for sailing vessels to adopt Torres Strait, nor will it be of much advantage to a ship to be in Bass Strait before the middle of December. Indeed it would be better not to be there before the middle of January.

A ship leaving Sydney or any other port on the East coast of Australia, should make Cape Howe her point of departure, and should not steer West of S.S.W. until she is in 39° 33′ S. lat., on account of the dangers she may meet from S.E. winds near Long Beach.

Having gained lat 39° 30′ S., she may then steer nearly W.b.S., leaving the Sisters Rocks, Craggy, and Wright Rock to port (southward). She will then sight Deal Island, the easternmost of the Kent Group, which in fine weather can be seen from the deck of a ship ten and even twelve leagues distant. In daytime she should steer for this island, and in the night for the revolving light which is on it, and which may be seen at a distance of nearly twenty-six miles. She would pass three or four miles South of this island, then continuing westward she will sight successively the other islands of the group to the southward, and pass at the same distance from them. She would proceed in the same manner with respect to Curtis Island and the Sugarloaf Rock, which will now be in sight. From Curtis Island to the northern extremity of King Island, the route is nearly W.b.S., and the distance forty-two leagues. No danger exists in this part, nevertheless it is preferable to steer so as to pass, if the wind permits, five or six leagues North of King Island. If it be from West to North, she may safely steer for Three Hummock Island, and pass either North or South of King Island, according as convenient. She would look out, however, for three small islands seen by the French

corvette *Géographe* in lat. 39° 53′ S., about thirteen leagues East of Sea Elephant Bay,—but these islands appear to be doubtful.

Anchorages in Bass Strait with West Winds.—In case of contrary winds, if the weather be bad, and S.W. winds set in blowing strong, there are several anchorages where a ship may wait for a change. The best are these:—

1st.—The bay West of Erith Island, one of the Kent Group.

2nd.—Hamilton Road, at the eastern extremity of Preservation Island.

3rd.—Off the South coast of the largest of the Swan Islands (convenient only for small vessels) and Waterhouse Island.

4th.—Port Dalrymple.

5th.—Port Sorrel, accessible only to small vessels.

6th.—Several bays in Hunter Group.

7th.—Sea Elephant Bay, on the East coast of King Island, where fresh water may be had. The anchorage is under the N.E. point of the island with the wind at S.W.

8th.—Western Port, sheltered by Grant Island, where the ship should anchor as soon as within the entrance: when the wind is good for passing the strait, this will allow of her making sail and leaving it readily.

9th.—Port Phillip.

The ports abovementioned affording shelter only from certain winds, and these being very variable in Bass Strait, a ship should be always ready to get under sail so as to leave them directly it becomes necessary.

The navigation of Bass Strait demands prudence and caution.

North Route by Torres Strait.—From March to September passages from Sydney to Bengal, as well as to ports in the eastern islands, may be made by Torres Strait. In this route the ship should make to northward along the coast of Australia as far as Sandy Cape, and then should take the *Inner* route. A ship taking the *Outer* route on leaving Sydney should adopt the most convenient course for the meridian of 155°, and steer so as to pass West of Howe and Middleton Islands. She would then make to the northward, taking care to avoid Wreck Reef, the Bampton, Minerva, Bellona, Ball, Kenn, and Frederic shoals, among which Lamb and Bass Islands are passed. These banks and islands are situated between the parallels of 24° and 20° S. lat. Allowance must also be made for a N.W. current of at least a mile an hour. When Wreck Reef is passed, a course should be steered so as to pass sixty miles East of Diana Bank, from whence Torres Strait may be entered.

(To be continued.)

The French in Madagascar.—1642 *to* 1672.

(Continued from page 406.)

For six months Pronis remained a prisoner, when the *Saint Lawrence*, commanded by Captain Roger Lebourg, came to an anchor off Fort Dauphin, and he was placed on board of her to be conveyed to France. But Lebourg, by remonstrating and his conciliating spirit, succeeded in pacifying the majority of the discontented against Pronis, and in reinstating him in his authority. Nevertheless, he was obliged when away from him and to prevent a reaction of the most mutinous against Pronis previous to his departure, to adopt measures for getting them out of the way for a time at least.

The necessity for establishing factories for the temporary reception of the stores of provisions for the fort as well as the articles of commerce, afforded plenty of pretext for this. Some were sent to the westward under Leroi among the Mahafales of St. Augustine Bay to obtain cattle. Others went with Boquier among the Antavares on the borders of the Mananzari to trade for ebony, the *Saint Laurence* requiring a cargo, and Beaumont was sent to St. Mary's with a third detachment composed of eight men, to commence a fortified post for the defence of this small island against the natives of Antongil, who came there from time to time.

Pronis had no more consideration for the natives of Madagascar than he had for his own countrymen. A Dutch vessel came to Fort Dauphin to buy slaves, and encouraged by Lebourg, who cared more for his own profit than the success of the colony, he seized forty male or female natives of Anossi, among whom were even the parents of Diana Ramach, and sold them to the Dutch. At that time Pronis had also imbibed a strong dislike to a negro named Razau. This man had been a long time at Fort Dauphin and had rendered important services to the colony; but he had had an intrigue with Dian Ravel, which was a crime that Pronis was not the man to pardon, and he was expelled from the fort. He returned to his village, where he remained quiet, when a Frenchman named St. Martin, who was considered discontented with Pronis' administration, went to find him; and the moment Razau came forward to receive him shot him with a pistol which he had carried for the purpose. Razau fell, and St. Martin returned to the fort to give the information that he had killed him.

The native was not killed. The ball had passed round the cheek-bone, and he fell purposely to deceive his enemy. But he vowed revenge, and to kill every Frenchman on the island; and having concealed himself in a wood, a few days afterwards he killed one. But Pronis with threats of war compelled Dian Ramach, Dian Mechicore, and other princes of Anossi to deliver to him the head of Razau.

Leroi and the men which Lebourg had sent to Mahafale soon after this returned to the neighbourhood of the fort; but they would not enter it, and even took up a hostile position. The natives, who from

causes referred to already, had armed themselves against Pronis, waited for their opportunity of revenge; but Pronis went among them and overawing them by his boldness promised them if they would return to their homes no one should be punished. They did so, but no sooner had they done so than Pronis seized a dozen of them, who were sent on board the *St. Lawrence* to be transported to Mascariegne. This was the manner in which Pronis kept his promises; but Leroi, apprehensive of his hatred against himself, resolved to go to St. Augustine Bay and encourage natives to join him, in hopes of obtaining assistance from vessels which were more frequent off that point than any other part of the island.

Prony was then left with very few of his countrymen, for a body of them under Angeleaume left him to obtain cattle from the heights of Manzanari and to serve the prince of that country in his wars. About this time the garrison of the fort was so much reduced that Dian Ramach and the chiefs of Anossi who had received the French with kindness but who had become disaffected towards them, began to think of falling on the remainder and killing them. Dian Tsisseï, the brother-in-law of Dian Ramach, set out with 300 natives armed with spears, with the pretext of paying his respects to the chief of the establishment, but with the real determination of killing him and his companions. Pronis had been apprised by Dian Ravel of the plot against him, so that when Tsissei arrived he found Pronis alone with a match in his hand before his house, where he had placed a cannon, and threatened him if he did not go away to fire it, directed as it was at him and his people. This reception was enough for Dian Tsissei, who, terrified by the resolution of Pronis, ordered his men to return, declaring that he could never be the enemy of so bold a man.

At this juncture of affairs Flacourt arrived most opportunely. The colony was falling away as much from want of provisions as from want of men: but Pronis, notwithstanding his faults and failings, had some good qualities essential for the management of a colony. Enterprising and courageous, no obstacle stopped him, always ready to undergo fatigue and privation; but taking advantage of every means for success in his measures, their effect was always spoiled by his jealous suspicions, his cruelty, and deceit, arising too often from the slightest motives, that eventually ruined his authority, inducing him to sacrifice every one's interest for his own personal and too often criminal advantage.

This disordered condition of affairs at length had opened the eyes of the Company in France, which had determined on sending out Flacourt, who belonged to it, along with additional colonists, and with directions to reorganize the whole settlement. He left Rochelle in May, 1648, with Lebourg in the same ship, the *St. Lawrence*, which had already made the voyage. Twenty-four colonists embarked with him, as well as two Lazarists, the Peres Nacquard and Goudree.

After a voyage of six months the *St. Lawrence* dropped her anchor in Mangafia Bay, and Pronis, on learning the arrival of his successor,

repaired on board the *St. Lawrence*, which the next day shifted her anchorage for that of Dauphine Bay.

Flacourt entered on his Governorship on the 15th of December, and his first act was to recall Leroi and Angeleaume. Bouquier and his companions had been massacred, having raised the natives against them by their lawless acts. Some of their people had escaped and regained the fort by land. As to Leroi and Angeleaume they had hastened to return there with their men when they were apprised that in order to satisfy the wishes of the original colonists Pronis had been sent away in the *St. Lawrence* to Galembroule to collect rice by trading. When the *St. Lawrence* returned with her cargo of rice, Flacourt sent her immediately to Isle Mascareigne, of which possession was taken by the name of Bourbon, and soon afterwards she sailed for France with Pronis.

Flacourt was a man of suspicious mind, and he was glad to rid himself at once of an active restless person like Pronis, who any moment might become his rival, and whom he looked on as his enemy already on account of the part he had taken in an intrigue against his policy. Dian Tsissei for some time had persecuted Flacourt to give him a musket, to which he at length consented; but he had a hole made in the stock of it that was filled up with lead. Just at that time Pronis came to Fanshere to have a child baptised which Dian Revel had, and he came first to Dian Tsissei: Dian had never concealed his indignation and dislike of Flacourt, who, on his part, believed that Pronis had not revealed his fraud, but with the object of killing him and to recover his position. He consequently sent him on board in irons, and so he remained until the ship sailed.

Flacourt had gone to Fanshere before these quarrels with Pronis; Dian Ramach, Dian Tseronh, Dian Machicores, and all the princes of Anossi, were collected there. He had made them presents, and they in return had paid homage to him and promised fidelity. But the new government continued the same kind of marauding expeditions as under Pronis; thus, while he himself was at Galemboule, Ramicaze had been sent into the province of Evondrou to look after cattle: Leroi had gone to make war againrt the Mahafales and to get what he could from them; but he was obliged to cross the country of the Ampatares, and was so severely treated by them that he was obliged to send for assistance from the fort. It was sent to him by La Roche, one of whose men was killed by a spear on the banks of the Mandrerei, which separates the Anossi from the Ampatres country, but he had timely assistance, and was enabled to drive off the natives easily. There was nothing to be surprised at in the death of a Frenchman in the colony and under such circumstances, but it is mentioned here because it is in fact the first act of hostility on the part of the natives of the country, and was the prelude to the war which the French carried on against the chiefs of Anossi, the Ampatres taking no part in it except at the demand of those chiefs.

The condition of the colonists in reference to the natives became every day more critical, for every day added some fresh trouble. An

accident which now happened added to their embarrassments. Angeleaume, with eight Frenchmen, had come to visit Dian Ramach, and he had remained to assist at a religious festival, which takes place in June. During its celebration the French fired a salvo of musketry, a piece of wadding fell on a cartridge and it exploded. This accident was very nearly the cause of all those who had come to the ceremony being massacred. They owed their lives only to the intervention of Dian Ramach, who determined not to embroil himself for good with the French, but who waited for the opportunity of destroying them all at one blow.

A few days afterwards this opportunity seemed at hand. Angeleaume had gone to assist Leroi on the borders of the Mandrerei, and at the end of eight days he returned to the fort. In the course of this interval a kabar or public meeting took place at Fanshere, with the pretext of terminating a family quarrel between Dian Ramach and five other chiefs all brothers-in-law, but with the real object of concocting measures for the expulsion of the French. Flacourt, however, was informed of their intention, and sent to Leroi to return to the fort. Leroi on his way, when near the Mountain Domboulombé, fell in with some thousands of the natives, who attacked him vigorously. The party with Laroche formed themselves into a group and fighting back to back gradually regained the fort, surrounded by the natives, who threw their spears at them, but from a distance, as they were kept off by musketry.

The common weapon among them is the Sagaie, a sort of long spear, which the Malgaches throw with much dexterity. At Galemboule, on the neighbouring island of St. Mary, formerly the Nosse Ibrahim, they have bows and arrows, and some have small round shields. When public rejoicings take place, they go through manœuvres with the spear, making all kinds of contortions, and when in these exhibitions a warrior deigns to display his prowess, all his family range themselves round him, and show by signs of fear and admiration their approval of his defiant attitudes and his grotesque contortions.

They are frequently at war with each other on frivolous pretexts, and make sudden attacks on their enemies, who, when they are the weaker party, fly without the least shame, and the victors massacre every one they can even to women and children, fearing to leave any to revenge.

They fight without order, uttering cries and making menaces like the heroes of Homer, and when an enemy is overcome every one dips his spear in his blood. All the time that the men are absent engaged in war, the women never enter their houses, not even for sleeping or eating.

While Leroi continued at war with the Ampatres and the Machicores, the Roandrians or chiefs prepared to attack the fort, and had pursued Laroche up to its gates. But there the artillery commanded their respect, and in spite of their numbers they durst not attempt to take it by force, but had recourse to stratagem.

Dian Ramach and Dian Tseronh made proposals of peace, to which Flacourt invariably answered, "Why do you make proposals of peace to us. Go away, as you have neither complaints to make nor anything to reclaim. When we took possession of your lands and your cattle it was with your consent, and we paid you. There was no want of conditions and we desire peace also."

Perhaps the natives had sometimes deceived and plundered; but these people, who punished the thief or the offender with severity, had shown themelvses so unscrupulous with the French, that they could have no right to recriminate. If they were reproached as assassins, they could on their part point to the death of Razau, and it is too true that this crime had been attended with circumstances which could not be pardoned.

The supplies of provisions were always failing, and the garrison complained, and Flacourt, to avert the evil, ordered a sortie in the direction of the coast of Imour, which obtained 500 head of cattle. He afterwards built a vessel of 30 tons, which he sent in search of rice.

It was about the month of July, 1651, that is, for more than a year, they had to guard against the stratagems of their enemies as well as their open attacks. But now determined to put an end to them, a party of forty French and forty of their most faithful negroes was formed and sent to Fanshere for the purpose of destroying it.

They set out at night and by daylight had arrived at the principal village of the Anossi country. Those who composed it soon removed some palissades of its surrounding fence, and entering by it one by one they made directly for the abode of Dian Ramach, which was in the middle of the village and on its highest part. Whilst some set fire to it as well as to all the others round it, he had time to escape; but as he was swimming across the river, he was struck by a ball, and saw his son killed at his side. A general massacre of the inhabitants followed, of whom many were destroyed by fire in the village.

About 1640, the seamen of a Portuguese ship, which was on her way to Goa, anchored in Galion Bay, had carried off Dian Ramach, son of Dian Tsiambau, the king of the Carcanossi people. The ship sailed with him, and he was instructed and baptised by the jesuits, and finally brought back to his country, where he resumed the costume and religion of his father, and which he maintained until his death, "brought on (says Flacourt) by his perfidy, having intended to massacre the French without any cause, and myself as their chief under the mask of friendship; but as I was warned by the past, God has preserved me."

The destruction of Fanshere terrified the natives, with whom force is far better than reason. From all sides the chiefs of the Amboule valley came to tender their submission. Dian Tseronh and Dian Machicores continued however to resist, but followed and persecuted they were compelled to do the same. Dian Panolake was the last who came to pay his homage in the month of September, 1652. But all the chiefs who had submitted did not pay the amount of tribute

required of them, and it happened that Angeleaume, accompanied by Dian Boulle and other faithful chiefs, followed to the Metatanes the chiefs, who no sooner than mutinied were reduced; but they were again obliged to pay tribute, and in their turn to compel the minor chiefs to do the same. The submission of Dian Machicores was complete. He freely delivered hostages for his good conduct. Flacourt also conferred on him the same power as he had given to Dian Ramach, and he soon after gave a fresh proof of his devotion to Flacourt by making war on the Ampatres, a race of natives in the mountains always hostile to the colony, and by sending him the head of their chief.

Whilst these things were going on abroad, in France matters became materially altered. The maritime power of the country became every day weaker, and the resources of the company were nearly exhausted; nevertheless, in 1652, an extension of their powers for fifteen years was obtained. And seeing that the company did nothing, the Duke de Meilleraie, on his own account, sent ships out to Madagascar, and so long a time passed without any arrival, that Flacourt, despairing of seeing any more come out, began to think of abandoning Fort Dauphin and returning to France in the little vessel in which the coasting voyages along the island of St. Mary were made between Maremboule and the fort. On the 26th of December he embarked with the pretext of visiting some post which he had established on the coast; but being overtaken by a violent storm, he was compelled to return, and it was with considerable difficulty that he regained his authority, which had been seriously compromised by this step.

Still it was necessary to make known in France the precarious condition of the settlement, destitute not only of the means of defence, but also of articles of commerce. It was therefore decided that Angeleaume should go to Mozambique for the purpose of asking the Governor to send letters to France through the French ambassador in Lisbon from Flacourt, informing the company of the state of things in the island. Soon after this he also sent a letter to St. Augustine Bay, addressed to the first Christian captain who might anchor there, requesting him to give him what intelligence he could of France, and requesting that he would take the letter home to M. de Loigres, Secretary of State for the Navy. It was then that Flacourt, who had never doubted the course which the Duke de Meillarie would adopt with regard to the affairs of the company, had the satisfaction of seeing the two ships sent out by him arrive in Monfia Bay, and soon learnt that Pronis was in one of them. M. de la Forest, the commander, sent him two letters, one from the directors of the company with the sole object of recommending two missionaries, the other from the duke requesting him to remain at Madagascar in his office, and continue what he had begun. In consequence of this silence on the part of the directors, and the letter from the duke, Flacourt had reason to believe that the latter was legally in possession of the rights of the former, and placed the government of the colony in the hands of M. de la Forest, who transferred it immediately to those of Pronis.

Flacourt had been governor of the colony for six years, when, on the 16th of February, 1655, he repaired with Pronis on board the *St. George*, to take leave of Captain Forest. He afterwards went on board the *Ours*, commanded by M. de Goascaer, in which vessel he sailed for France. As she made sail on her departure, Pronis, in the little coasting vessel called the *St. George*, returned to the shore, rejoicing in the sound of the oars, and, as he approached the establishment of which he was again the governor, thinking of anything but the errors which he had already committed. In the midst of all his projects of improvements, the office of governor became dearer to him, and no sooner on shore than he was in his palace. He was received by a salute of musketry, from which a piece of cartridge fell on the roof of the guardhouse, thatched with dried grass, to which it set fire. This was the second accident of this kind. It was soon extinguished, but it was necessary to pull down the remainder of the building to reconstruct it. Some of the pieces were thrown down by a blacksmith's forge, and some copper work going forward, in throwing away some contents of his melting pot, this set fire to them, and it spread so rapidly that in a moment the neighbouring houses were enveloped in flame and soon reached that of Flacourt, the same that Pronis was to occupy that night. In two hours all the houses of the fort were burnt down, with the provision stores and the armoury. Under the explosion of the granades the stone built house in which they were kept was blown away. The magazine in which the rice was kept was blown up by the explosion of four barrels of gunpowder, while the fire was spreading to another magazine containing the stores of brandy, wine, sulphur, pitch, and other inflammable materials. Pronis was scarcely able to save a box from the effects of this disaster, he was obliged to take up his quarters in a house outside the fort, with his dreams of grandeur, from whence he might see the remains of the fire which had annihilated his hopes and converted his resources into smoke. At the end of three days Fort Dauphin was but a heap of smouldering ashes, and the colony was reduced to a few cases of stores that had been removed outside the fort, being all that was saved from the fire.

(To be continued.)

The Strait of Gibraltar.—*Tides and Currents.*

(Continued from page 344.)

From the tidal observations made in the Strait of Gibraltar in the years 1852 and 1853 the following establishments have been determined:—

West Coast of Morocco.—Mogador, 1h. 18m.; Rabat, 1h. 46m.

West Coast of Spain.—Chipiona, 1h. 30m.; Rota, 1h. 24m.; Cadiz, 1h. 23m.; Conil, 1h. 18m.

Strait of Gibraltar.—Cape Plata, 1h. 45m.; Tarifa, 1h. 46m.; Gibraltar, 1h. 47m.; Algeciras, 1h. 49m.; Ceuta, 2h. 6m.; Tangier, 2h. 13m.

North Coast of Morocco.—Tetuan, 2h. 23m.

The tidal ocean wave that makes high water would arrive simultaneously first at Mogador and Conil. Continuing on into the strait, it would produce high water nearly at the same time on all the coast between Cape Plata and Europa Point. It is not, however, until about twenty minutes after it has attained its highest level on the coast of Spain that the water reaches its highest level on the opposite coast of Africa. Being unable, unfortunately, to make any tidal observations on the African coast, besides those of Ceuta and Tangier, the tides of the salient points of Africa, such as Cape Malabata, Point Ciris, and the North point of Ceuta Peninsula, are considered to be nearly similar to those of the coast of Spain.

Referring to the establishments of Toulon, Algiers, and Cagliari, it will be observed that those given above of the coast of Spain in the strait of Gibraltar, differ six hours from them, and therefore it must be low water in the strait when it is high water in the above Mediterranean ports; and, by the usual mode of reasoning, the flood will be making in the strait while the ebb is running at Toulon, Algiers, and Cagliari, and *vice versâ*.

Observations are yet wanting to inform us whether high water is made at Toulon by the same wave that makes low water at the same time at Gibraltar. But, admitting this to be the case, and which it most probably is, the establishments of all the ports on the coast of Spain in the Mediterranean would fall between those of Gibraltar and Toulon; and, at all events, whether that coast is visited by one or more undulations, the same result would follow.

It is well known that the tidal wave on the coast generally occasions a periodical stream of current of about six hours in opposite directions. Whatever cause may be advanced to account for these currents, whether it may be the difference of level between high and low water, or the undulation of the tidal wave, or any other cause, it is well known that in close bays the flood continues until it is high water at the head of the bay; and the ebb lasts until it is low water there. Now, if the western division of the Mediterranean as far as Sardinia and Corsica be considered as a close bay, the tidal wave from the Atlantic will flow into the Mediterranean while the tide is rising at Cagliari, and it will flow back into the Atlantic while the tide is falling at Cagliari. This, in fact, appears to be the law by which the tides are governed in the strait of Gibraltar.

The stream of flood is considered to commence when the tide rises, and that of ebb to commence when it falls. But it is necessary to add that this only is true in reference to the port alluded to, and which should be named. In fact, if that be called the stream of flood which is established in the strait of Gibraltar at the moment when

the wave enters the Mediterranean to make high water at Cagliari, this flood stream for Cagliari will be the ebb for Gibraltar, and *vice versâ*. And this appears to be the explanation of the anomaly which has been noticed by all navigators. They have observed that in the strait of Gibraltar the stream of flood, or that which is running while the tide is rising on its shore, runs to the West; while the stream of ebb runs to the East.

Designations of the Streams of Ebb and Flood.—We shall confine ourselves here, in reference to the strait of Gibraltar, to the terms stream of flood and stream of ebb, to designate the movement of the waters when the tide rises or falls in the ports of the strait. But it must be remembered that the stream of flood will be really the stream of ebb for the Mediterranean; and what we call the stream of ebb is the stream of flood for the Mediterranean.

Height of the Tide.—We have but little to say on the rise and fall at the ports where we have observed the tides. In proportion as the tidal wave progresses towards the Mediterranean, the difference between high and low water decreases rapidly. In the following table will be seen the amount of rise and fall at springs and neaps, and the number of days of observation at each place.

Places.	Establishment.	Highest Spring Range.	Difference between High and Low Water Neap Tides.	Number of Days of Observation
	h. m.	Ft.	Ft.	
Chipiona	1 30	12·5	3·6	58
Rota	1 24	12·6	3·6	39
Cadiz	1 23	12·9	3·6	26
Conil	1 18	11·8	3·3	12
Cape Plata	1 45	8·3	2·6	50
Tarifa	1 46	5·9	1·3	73
Algeciras	1 49	3·9	1·3	30
Gibraltar	1 47	4·1	1·3	157
Mogador	1 18	12·4	3·6	8
Rabat	1 46	11·0	3·3	9
Tangier	2 13	8·3	2·0	76
Ceuta	2 6	3·7	1·3	76
Tetuan	2 23	2·3	0·5	3

Currents in the Strait of Gibraltar.—We shall only here enter into the surface currents of the strait, because these only concern the navigator and the law by which they are regulated is subject to many exceptions.

Most frequently a strong wind is prevailing in the strait, and it will last for whole months, exerting always a considerable effect on the surface water. Our observations establish the fact of this influence, as shown by perturbations in the rise and fall of the tide that has been entirely produced by the existing wind; the consequent

effect which this must have on the currents will be evident. In the sequel we shall always exclude those accidental variations which may produce currents under the influence of atmospheric phenomena and we will state once for all that this influence not only depends on the strength of the wind, but also on its duration.

Permanent Currents.—The currents of the strait of Gibraltar are of two kinds: the currents of the one are permanent and their direction constant. They run from West to East, transferring to the Mediterranean the waters of the Atlantic, and would probably do so with a constant rate if it were not for the effect of winds prevailing at sea. The other kind of currents proceeds from the tides; they vary in strength according to the age of the moon—that is, according to the force of the tide. They are periodical as the tides by which they are produced. With the rising tide the stream sets to the West, bringing the waters of the Mediterranean into the Atlantic; and with the ebb the tidal stream sets East from the Atlantic into the Mediterranean; and these currents exert their influence over the whole surface of the strait.

While the tide is falling the ebb stream is running in the same direction as the permanent current with their united strength, and the water of the whole strait runs into the Mediterranean from the Atlantic. With the rising tide in the strait the flood runs West, a direction immediately opposed to that of the permanent current. In this case, if the strength of the stream of flood is less than that of the permanent current, the stream will continue to run eastward, and if the two streams have equal strength there will be no current; and, lastly, if the flood stream is the stronger the current will run to the westward. But always when the current runs westward in the strait it can only do so for one tide, and its strength will always be less than that of the current to the eastward. These principles being established the usual currents of the strait may be explained according to its general form and the direction of its shores.

Division of the Strait.—We shall divide the strait into three portions. The first, or western, between Cape Trafalgar and Tarifa and its opposite coast, Cape Spartel and Point Ciris. The second, between Tarifa and Point Frayle and its opposite coast, Point Ciris to Point Leona. The third from Point Frayle to Europa Point and its opposite coast, Point Leona to Ceuta.

For the sake of the argument, we shall consider the shores of the strait divested of their sinuosities. In the several bays which it forms there are eddies produced by the general current of the strait, and the law which they follow it is easy to perceive depends on the formation of the coast and the direction of the main stream.

We will now take our first westernmost division. If we consider the two capes, Tarifa and Trafalgar, as well as those of Ciris and Spartel, to be joined by a straight line, we shall have an irregular quadrilateral figure, containing an enormous space, three times the area of the eastern one. Besides this, the northern side of it lies N.W. and S.E., while the southern side lies in the direction of East

and West nearly. The second figure is very different; the two openings (eastern and western sides proceeding as in the first case) are nearly equal, its breadth is nearly uniform, and on its North and South sides it has deep bays. In the third figure the eastern opening is much larger than the western; besides which it also contains the deep bays of Algeciras, to the North, and Ceuta, to the South.

If we consider what ought to be the action of a permanent current from the westward, one may easily perceive that the waters on entering the first division would accelerate their progress in proportion as the space through which they must run becomes reduced. This current, therefore, would become the more rapid in the first division as it approaches the meridian of Tarifa. Its strength would become greatest in the second division, and would again decrease on entering the third. Besides this, the current would be more rapid also in the middle than on either shore. Near the shore, in fact, the waters meeting obstacles opposed to them there, lose a portion of their velocity and undergo besides a change in their course. While the waters continue along the African shore in their direction to the eastward those on the coast of Spain will be directed to the S.E. by the same cause.

Off Tarifa and West of its peninsula the waters are interrupted by the coast, the general direction of which is southwardly, towards the African coast, to follow afterwards their eastern course. Hence, in the second division the current is very rapid on the African shore.

On penetrating into the third division there is space in which the waters may become spread, and they extend principally to the northward; and in this division also a stronger current is found on the African shore than on that of Europe.

Thus, then, it appears that the permanent current coming from the westward, while it is weak between Capes Trafalgar and Spartel (but, nevertheless, stronger in the middle than on either shore), increases in strength as it approaches the meridian of Tarifa. Off the Spanish coast the stream runs S.E.; on the African coast it has a tendency to run N.E.; and in the middle of it to run East. It is near Tarifa and off Point Ciris that the current attains its greatest velocity. Near Tarifa it runs to the S.E. towards the African shore, and off Point Ciris it runs E.N.E. The mass of waters under this combined influence traverse the second division in a direction parallel to the African coast from West to East. The most rapid portion of the current is found nearer to the African than to the Spanish shore; and it is the same in the third division, where the waters enter the Mediterranean, continuing their course parallel to the line of the African shore, and extending in the North towards the bay of Algeciras and Europa Point.

The Ebb Stream.—If we admit the tidal streams into our discussion, it is sufficient to remember that the ebb having the same direction as the permanent current, they unite and continue to run in the direction abovementioned.

The Flood Stream.—In respect of the flood, the strength of its

stream varying with that of the tide, and its course being directly opposed to that of the permanent current, its effect will depend on the moon's age, or on the strength of the tidal stream. It has been observed, in fact, that on the borders of the strait, where the permanent current (as we have observed) is little or nothing, there every returning tide produces a change in the direction of the general stream. Whenever the water is rising the stream of either shore is running to the West; but they always run eastward while it is falling. Again, in proportion as the distance from the shore is increased the westerly stream is found to decrease,—in fact, according to the distance from the shore so is the strength of the tidal stream; and there is a line at a greater or less distance from the shore where there is no current, and which separates the main body of the waters always flowing to the eastward from that setting along the coasts in which the tides are experienced. This line is perpetually changing its place every day, for its distance from the shore varies with the strength of the tidal stream.

Changes in the Direction of the Tidal Stream.—It has been found from our observations throughout the whole extent of the strait, that off the salient points, such as Europa, Tarifa, and Trafalgar, on the coast of Spain, and Spartel, Ciris, and Leona, on the coast of Africa, the stream of tide turns at the moment of slack water. As soon as the tide begins to rise the stream commences running to the West; and as soon as it begins to fall, it commences running to the East. But off shore, according to the opinions of the pilots, the change of stream appears to precede that of the tide about three-quarters of an hour on the coast of Spain, and, consequently, above an hour on the coast of Africa, since the tidal establishments on this coast are later by about twenty minutes than those of the coast of Spain. Thus, at the moment of slack water, for instance, at Tarifa, the westerly current will have ceased everywhere off shore, and in three-quarters of an hour the easterly current will be re-established.

Although it is easy to ascertain at every returning tide its western stream inshore on the borders of the strait, it is not so in the offing. From the foregoing it is seen that as, according to the distance from the shore, the permanent easterly current increases in force with its distance, it may be that the stream of flood at some part is not strong enough to overcome it and then that the waters continue running into the Mediterranean with a reduced velocity. From numerous observations we believe it may be stated as fact that in the western part of our first division, even the weakest tides produce light westerly currents. In the western part of the third division and in the middle of the first the stream of flood is only sensible at springs; and in the second division (the narrowest), as well as in the eastern part of the first, it is only at the times of the highest equinoctial tides that the westerly current can be expected, but even then only very weak. Nor have we, during a period of sixteen months, been able to discover this current more than once, and then produced by the combined effect of a favourable wind and a spring tide.

As to the distance to which it reaches from the shore, it is easy to perceive that it would be furthest in the first division, but that in the second and off the salient points of the third division this will be very little.

The foregoing general facts being established, we will now proceed to consider the movement of the whole water of the strait generally while the tide is rising.

The flood penetrates into the strait and is perceived at Europa Point and Ceuta as soon as the water commences to rise. Being in general too weak to overcome the permanent current, it is felt at some cable's length only from Europa Point and the N.E. point of Ceuta Peninsula. Off this last point the water flows direct for Point Leona. Off Point Europa the stream of flood runs S.W., and is much stronger than on the African coast. It makes for Point Carnero, throwing a portion of its waters into the bay of Algeciras, of which we shall speak presently. Meeting then the easterly current, obliges the tidal stream to diverge more and more to the South. But after having crossed the bay of Algeciras the flood continues along the coast of Spain to Tarifa, and thence, continuing its westerly course, gradually increases its distance from the shore, but following the direction of the coast to Cadiz. On the African coast the flood stream is found equally, first from Ceuta to Point Ciris, but always at a very little distance from shore. From Point Ciris to Cape Spartel the flood stream continues West, the effect of which spreads over a continually increasing space. Arriving at the western part of the strait, the stream follows the line of coast, one part flowing northward towards Cadiz, while the rest runs southward along the African coast.

Such is the general course of the flood tide of the strait. Nevertheless, it must be observed for the information of seamen that the space in which the flood tide prevails throughout the strait is much more extensive on the Spanish coast than on the African side. Perhaps both coasts in the first division have similar advantages in this respect; but in the second division, and also in the third, the westerly stream of flood is strong and extends further out from the Spanish than from the African coast.

Eddies and Counter-Currents.—We will now turn our attention to the counter-currents and eddies produced in the bays and indentations of the coast, occasioned by the currents outside meeting the salient points of the shore. In general, when a current is running outside of a bay, and if it run in a direction oblique to its opening, as the stream runs against a point of the bay a counter-current is formed there which assumes a direction along the shore the reverse of that outside of it.

Counter-Current of Tangier Bay.—In Tangier Bay the ebb stream runs full on Malabata Point, and one part turns to the South, forming a current which runs along the whole shore of the bay in a direction opposite to that of the current outside of it. Our observations show that this effect, which takes place in all moderately deep bays, results in currents as periodically regular as those produced by

the tidal currents themselves: only this reversal of the current does not take place at slack water, like that of the current outside. It is necessary that this current should be running for three hours for the counter-current to commence, and thence it will not be until above three hours of ebb at Tangier that the counter-current will be running from East to West, and the tide will have three hours to rise when the counter-current to the East will commence.

Counter-Currents between Point Al Boassa and Ciris.—This fact concerning the counter-current in the bays is always the result of the outer current being sufficiently strong to produce it. Now it happens that in the great bay between the Points Al Boassa and Ciris that the ebb stream, very strong as we know it to be off the latter point, produces a counter-current; while the flood, by no means so strong, and meeting a less salient point, Al Boassa, is attended with no counter-current. In this case, as at Cala Grande, the stream on coming in contact with the land between Point Aleazar and Point Ciris produces on the ebb a counter-current to the West, along the coast between them. When the flood stream comes all the water runs to the West along the shore, and the consequence is that the bay of Cala Grande has this great advantage that near the shore the current runs continually from East to West. This fact, long known by the pilots, is of great importance to vessels passing the strait from East to West with foul winds.

Counter-Currents East of Tarifa.—It is much about the same to the East of Tarifa. The flood tide there is never sufficiently strong to produce any real counter-current, while with the ebb the current which runs S.E. occasions a counter-current to the East of Tarifa along the coast from East to West, the effect of which is sometimes felt very far to the East of this peninsula.

Counter-Currents in Ceuta, Barbate, and Lances Bays.—We shall say nothing of the counter-currents in the bay North of Ceuta. Things are much the same there as in the bay of Tangier, only that the counter-currents there are extremely weak, and for the most part nothing. Nor shall we say anything of those in the bays of Barbate, Bolonia, Val de Vaqueros, and the Lances anchorage. They are sufficiently explained by what we have said; but we must devote a few words to what goes forward this way in the bay of Algeciras.

Counter-Currents in the Bay of Algeciras.—In the great bay of Algeciras or Gibraltar there are peculiar counter-currents, with which the seaman ought to be acquainted.

On the flood tide the stream enters the strait at Europa Point and makes towards Point Carnero. Off this point while a portion continues on its western course another takes the western shore of the bay, making a northerly course from Carnero to Algeciras. And then as the flood stream passes Europa Point, a portion gradually flows round this point, continuing along the peninsula of Gibraltar from South to North to the head of the bay. It there meets with the current from the western side of the bay and then, by their combined action, a current to the southward is established down the

middle of the bay until it joins the flood stream which is running in the strait.

Thus, during the flood, there are actually three currents in the bay of Algeciras, two of which flow from South to North along each shore, and, uniting at the head of the bay, form together a current between them running South out of the bay.

One thing only to be observed is that the current on the western side is very much stronger than that on the eastern side of the bay. The counter-current at Point Carnero commences as soon as the flood makes there. In about an hour it reaches Getares and does not penetrate to Algeciras until two hours after the turn of the tide. As for the current on the eastern side of the bay, it does not reach the anchorage off Gibraltar until three hours after the flood makes; the consequence of which is that the current on the flood never lasts so long as that on the ebb, nor does it ever run so strong as this.

As soon as the ebb commences in the strait the tidal stream enters Algeciras Bay round Point Carnero, taking its course from S.W. to N.E. across the bay. Having gained the head of the bay, it divides, one part running along the shore towards Gibraltar, the other towards Algeciras, establishing a current from North to South along the whole western shore of the bay. And thus on the ebb, in the same way as on the flood, there are three currents in the bay of Algeciras. These currents are quite periodical, changing regularly with every tide, and about two or three hours after high and low water. It has also been observed that these particular currents produced by the general stream are subject to considerable variation. Not only has the wind a considerable influence over them, but their velocity and their extent depend much on its force.

In connection with the foregoing it may be observed that off Point Carnero the currents run almost always either N.W. or N.E., and, consequently, in general *towards the shore*. Point Carnero, or perhaps its neighbour to the West, Point Acebuche, is one of the most difficult points for ships to get round from the eastward. Besides which Point Carnero is the most dangerous in the whole strait. Most of the wrecks in the strait occur on this point, in consequence of the currents abovementioned.

Velocity of the Currents in the Strait.—The strength of the currents varies as much as their direction, and it is extremely difficult to explain it. The strongest current of which we have tried the rate was 5·2 miles per hour, in the middle of the strait, North of Point Aleazar, about four miles from the African Coast, when it was running East and West. We have also found from four to five miles an hour at a short distance from the shore West of Tarifa, and running S.E. Off the Points Ciris and Leona we have found it from three to four miles. But these measurements may be exceptionable from being obtained at springs in the full strength of the ebb.

At a cable's length from the South point of Tarifa, on a spring tide, we have found the ebb setting S.E. in full force at the rate of four miles an hour, while the flood was less than three. At the same

place a neap ebb gave a rate of two miles, and the flood not more than 1·4 mile.

It is difficult to ascertain the rate of the permanent current, for to do so it would be necessary to anchor for some time in the middle of the strait. But from numerous observations which we have made it would seem to be a mile off the point of Tarifa, at 2·5 miles from the middle of the strait at its narrowest part.

Near the coast and in the bays the currents we have found have never exceeded a mile and a half an hour, and the flood has always been weaker than the ebb.

Tidal Streams between Cadiz and Cape Trafalgar.—The alternate streams of flood and ebb are found on the coast of Spain between Cadiz and Cape Trafalgar, the flood setting to the North along the coast, and the ebb to the South. Off Cape Roche these streams become pretty strong. They generally change like the tide,—that is, as soon as the tide rises the flood stream is established, and the same with ebb as soon as it falls, and they both attain their greatest velocity at half tide. Nevertheless, we have often observed on this coast, as well as in the strait, that the strength of either flood or ebb is greatest during the first hour of each tide. Thus, the current in the middle of the strait changing about an hour previous to slack water, and before the change of tide on the coast, it often results that exactly at high water the strongest current is found there running from West to East.

Changes of the Tidal Stream.—The water in the strait of Gibraltar is generally under the influence of some current, for when this ceases or changes it is never by a sudden change of direction preceded by a short period of rest. For instance, the stream of ebb setting to the East turns little by little to the South at the end of the tide; then to the S.W. with the commencement of the flood, to run West about two hours after the water begins to rise. But this rule is not without exception. Sometimes the last of the ebb turns northward, and we have been enabled to ascertain that at the same place the change of the stream will run northward or southward according to the caprice of the tide. The same has been observed on the flood following the ebb. The time occupied by the two streams thus to succeed each other in the opposite directions is just as variable in its duration.

The foregoing peculiarities in the succession of the tidal streams is the same on the coast of Spain that has fallen under our examination, with the only exception that not only is the cessation of the tidal streams longer, but the turning of the stream is also. Thus, for instance, with the eastern stream at half ebb it will run S.E.; at three-quarters ebb it will set South until it is low water: it will then run S.W. for an hour or two before assuming its westerly course, which will be that of the flood.

Tide Races.—There are probably few places in which the races of the tides are more numerous than the strait of Gibraltar. They are

generally found off all the salient points of the strait where the direction of the coast changes and near the banks in their neighbourhood. They form on a sudden without notice of any kind, the sea getting up as if exposed to heat and boiling over a fire as if it were intended to be evaporated. The wave is short, irregular, and very deep. These races are very formidable, not only for boats but even for small craft. The wind of course contributes to form them, and always augments their dangerous character.

Whatever may be the cause of these races we have usually observed that the most formidable races to be found in the strait of Gibraltar are generally where the angle of the point is most acute, and off which the water is not so deep. They are most generally formed at half tide, which is the time when the current is strongest.

In some parts the stream of flood, as well as that of ebb, produces these races; in others the race is only produced on the ebb. The points on the coast of Spain where races are found are Cape Trafalgar, the Cabezos Shoal, the South point of Tarifa, Point Frayle, the Pearl Rock, and Europa Point. On the coast of Africa—Cape Spartel, Point Malabata, Altares, Al Boassa, Ciris, Leona, and the N.E. Point Ceuta have also races off them.

Race off Cape Trafalgar.—The most violent race we have found was off Cape Trafalgar, and it forms there both on half flood and half ebb. It extends to a considerable distance off the cape in a direction S. 57° W., which is that of Mecca tower from the tower on Cape Trafalgar, thus crossing the bank of Aceytera and over all the small banks of the Phare. This race, which is more formidable both in extent and violence than any other in the strait, most probably arises from two causes—the sudden change of direction in the coast and the number of banks off it.

The Cabezos Race.—Every half tide a race is also found on the Cabezos, or near it, varying both in its extent and direction, and sometimes by following the small shoals it becomes considerably extended. Although not so violent as the race generally off the points, it gets up with a troubled sea even in calm weather; and in bad weather with much sea on it extends over the whole breadth of the strait from the Cabezos to the flats between Points Malabata and Al Boassa, on the African coast. And this direction is just that of the shoalest water of the strait, and called by the pilots the race of Bajas.

Race off Point Tarifa.—The race off Point Tarifa is comparatively of limited extent. On the ebb it extends to the S.E., but with the flood it is S.W. It appears at every half tide, and that on the ebb is generally more considerable than that on the flood.

Race off Point Frayle.—The races off Point Frayle and Europa Point are much the same as those just mentioned, the first resembling that of the Cabezos and the last that of Tarifa. Their only difference is in being less extensive and less violent.

Race on the African Coast.—Off Cape Spartel, on the African coast there is a race, as well as off Point Judios, and even off Point

Casbah, at the entrance of Tangier Bay. But these are generally of small extent and little importance, although they are found both with the ebb and the flood.

It is between Malabata and Al Boassa Points that the Almirante Banks are found—the Phœnix and Jaseur,—which have the worst races on the African coast, both on the flood and ebb, and, as above-mentioned, reach across the strait to the Cabezos.

The races off the Points Ciris, Leona, &c., as far as Ceuta, are of small extent. They are sometimes tolerably violent, like the tide which produces them; but this is only on the ebb, for those of the flood amount to nothing. In fact, we may repeat that in the strait, and principally to the northward of Tangier, there are eddies as well as counter streams of irregular occurrence on the spring tides, but they are of small duration and extent, and always disappear.

(To be concluded in our next.)

ACCOUNT OF A CHINESE CAMP OR VILLAGE AT BENDIGO, *Port Phillip, South Australia.—From the Bendigo Advertiser.*

Our readers are aware that a few years ago a large body of Chinese emigrated to Australia, and took up their abode there. The following shows their present condition, which seems hitherto to be little known to our own settlers in the vicinity of Melbourne:—

The population of this encampment, which is one of the oldest, and has been perhaps the most permanent in the district, is estimated here at about 1,000 souls, among whom there is but one Chinese woman. The number of tents is reckoned at 204, in each of which, on an average, over four men are constantly living. The village is of an oblong form, through the centre of which there runs one main street, consisting of between fifty and sixty buildings, all of which are devoted to purposes of business. There are a number of cross and back lanes, all very narrow, the main street, which is the widest, being little over fifteen feet in breadth. The buildings in all parts are huddled together as close as possible, and there are evidences about most of them which show that they have been standing for a very considerable time. The streets and lanes generally are kept pretty clean, but in some of the back slums there are disgusting and unwholesome collections of rubbish and filth, and the attempts which have been made at drainage have been very defective, so much so, that most of the drains have become a highly offensive nuisance. In the outskirts of the camp immense heaps of dirt of all descriptions have long been suffered to collect; but it was evident that some efforts had been made to remove them previous to the visit of the protector. One or two of them had been set fire to, and others were so arranged as to bear the

appearance of having been collected for cartage. It was evident at the first glance that some radical improvement and alteration were highly necessary.

In the neighbourhood of the encampment there is a piggery of some size, which is not badly arranged or kept, except that the drainage is not so well attended to as it might be, and also a poultry yard, in which there were a number of very fine ducks. A large quantity of fowls were to be seen in the outskirts of the camp. A garden has been cultivated at the lower end of the village, but it does not bear the appearance of having been very well attended to of late. Some panniers of Chinese cabbages grown in Spring Gully were exposed for sale in the camp, and we were told that there are several very good Chinese gardens in various parts of the district.

Immediately on the protector's arrival, and throughout the time of his visit, the inhabitants assembled in large groups, and displayed considerable curiosity as to his object and proceedings. They seemed to be very good humoured, and disposed to turn everything which possibly offered them food for merriment into jest. The ignorance of a few Europeans who accompanied the Protector in various matters seemed particularly to amuse them, but in all cases where their knowledge of English enabled them, they displayed the utmost readiness to afford every explanation. Their general civility, orderliness, and good humour were highly gratifying, and tended much to contribute to the interest of the visit. The situation of the camp is a pleasant and healthy one, and if they could be induced properly to attend to their sanitary arrangements, the inhabitants would no doubt have reason to congratulate themselves on their general freedom from disease.

The inspection of the various dwellings was extremely interesting. Gambling-houses, joss-houses, eating-houses, and smoking-shops were visited, as well as private habitations, and the scenes displayed in many of them were of a character not easily described. The gaming-booths, however, were all but deserted, their usual frequenters not daring to pursue their favourite pastimes during the visit of the protector. Most of these places appeared to be kept in a most creditable state of cleanliness and neatness. None of the implements and appliances of gambling were visible, and we are therefore unable to give any account of them. A cook-shop of considerable size, a novel description of building, being a tent of two stories, was visited, and an inspection of the arrangements occupied some time. Cooking operations on an extensive scale were being carried on on the ground floor and in the adjoining kitchens. Tables were laid out in the lower story, and the upper one seemed devoted to persons of the bettermost class. Inside, everything was very cleanly, and in the utmost order; but the back premises, as is almost unavoidable from the manner in which they are crowded in by the adjoining tents, are not so well kept as might be desired.

However, on the whole, many European eating-house keepers might take an example from the manner in which this establishment is conducted, The proprietor's name, as nearly as we could catch it, is

Chim Chat, and he seems to have a large number of people employed, and to be doing a good business. Viands, peculiarly of Chinese manufacture, of all manner of imaginable and unimaginable description of names, were in preparation, and a variety of delicacies, such as poultry, fish, and vegetables, edible equally by European and Mongolian, were displayed in profusion. Judging from the display of sundry joss or religious appliances on a sideboard, which we may remark, by the way, are commonly to be seen in the stores and private dwellings, we concluded that Chim Chat and the general run of his customers, if not too piously given, are at all events persons who recognise the propriety and necessity of keeping up religious observances, while the requirements of the bodily man are looked after with all the seriousness and attention they require.

While in the lower part of the establishment it was observable that boiled fowl, with a peculiar preparation of rice, and no end of chopsticks, was in demand, while a vast amount of sweatmeats and confectionary were also being consumed. In the upper story, in which were seven or eight small deal tables with forms, several sedate looking personages were found doing their devout devoirs to repasts of various descriptions. We here became acquainted, through the experience of constable Ryan, and the civility of one of the attendants, with the names and ingredients of a variety of confectionary which we there found laid out. We hardly think it necessary to trouble our readers with the knowledge thus and there acquired, as they would be very little wiser after receiving it. A personal inspection is absolutely necessary for the acquirement of a proper appreciation of these rarities. We were permitted to taste and try any amount of them, and some were found to be of very excellent flavour though of rather strange make. Through the polite attention of A-Cheong, some Chinese wine was produced, the peculiar flavour of which defies our power of description. A few sips perfectly satisfied us as to its quality.

The next noticeable establishment visited was a smoking shop. And here we may remark that opium smoking seemed to be carried on in almost every shop and dwelling, and, truth to tell, there was a smell of opium, a feel of opium, and a taste of opium everywhere and in everything throughout the whole encampment. This may have been partly fancy, but the impression was very strong. In the smoking shop alluded to a number of persons were found in different stages of influence from the potent and favourite narcotic. Reclining on curtained couches, spread with Indian matting, the lovers of opium were discovered smoking or preparing their pipes, lighting them at little lamps, with one of which each couch was provided, and inhaling their fumes until sleep closed their eyelids. Several men were seen overcome by the narcotic, apparently in a deep and quiet sleep.

A doctor's shop in the main street formed an object of attraction. But though we endeavoured to glean some information from the learned practitioner, a gentleman of ultra Chinese sallowness and opiate glassiness of eye, we succeeded in gaining very little knowledge of the nature of the large stock of drugs and mysterious parcels with which his

shop was filled, and that little our readers would gain little by our publishing.

The operation of shaving in one of the numerous barbers' shops was watched with much interest. From the peculiarity of the manipulation, and the strangeness of the instrument employed, a Chinese barber ought to be a man of nerve, and heaven knows the subject on whom he operates requires no less an amount of courage than himself. The forehead to the roots of the hair of the head is carefully gone over and cleared from hair. The eyebrows and even eyelashes are trimmed, the cheeks, the ears, the throat, and neck divested of their down or stubble, as the case may be, and the operation is twice gone over with different descriptions of razors.

A public joss-house was visited, devoted, as we were informed by A-Cheong, to the worship of the goddess Koon-yem, a not very imposing figure, about six inches in height, of dark blue, and somewhat gaudily arrayed. She was enshrined in a case adorned with much tinsel and crimson. Before her was a variety of offerings, among which, as appears to be generally the case with Chinese divinities, offerings of wine and various kinds of liquids were evidently the favourites. But eggs and cakes and fancy ornaments had also been placed at the service of this female deity, all of which, however, as far as appearances went, her dusky goddesship continued to look at with an eye of supreme indifference. No doubt her adorers will hold a different opinion.

In most of the superior places of business, the walls are hung round with a profusion of pink coloured slips of paper, on which a diversity of Chinese characters are inscribed. These A-Cheong explained to be visiting cards, and we can only say that the storekeepers generally in the encampment must have a very extensive and perhaps select acquaintance. We have done enough for once, however, we think, in the way of gossip about these matters, and trusting we have not wearied our readers, we will now state, as succinctly as possible, the result of the official inspection.

Mr. Pyke saw a good deal that was objectionable, and a good deal that required immediate alteration, and constable Dann, who was always at his elbow, took down very copious notes at his instruction, of what was here and there required. The health officer seems to have forgotten his appointment, or to have considered Mr. Protector Pyke of about equal consequence with a coroner's jury, for during the proceedings he failed to make an appearance. Having very carefully gone through the village and inspected and noted down as many of the numerous and unsightly nuisances with which it abounds as possible, Mr. Pyke proceeded to address a numerous assemblage of the inhabitants through A-Cheong. He told them in effect that he was determined to enforce more cleanliness in the camp, and that the filth with which he found it in many parts choked up, must be removed. He alluded particularly to the stagnant drains, and ordered the immediate removal of a fowl house, surrounded closely by private residences, which was in a most filthy state, as well as of other highly obnoxious

erections. About fourteen or fifteen dwellings and shops in the back parts of the village were ordered to be removed; but in the main street the protector deemed it unnecessary to move any of the tents.

His instructions were listened to with much attention, and all seemed to take them in excellent good part. It now remains to be seen with what promptitude and in what manner they will be carried out. Mr. Pyke, who left the encampment about half past two, was civilly taken leave of by the principal inhabitants.

Disturbances amongst the Chinese.

The imposition of an annual residence tax of £4 per head on the Chinese population of Victoria has excited a vast ferment amongst that singular people. The Victorians would of course be very glad were this impost to check the immigration of a people whose silent acquisitions in the auriferous districts have always been viewed with great jealousy. The Chinamen, however, impassive as they may seem, have not failed to imbibe a few of the notions upon which Britons are accustomed to pride themselves. They scout the notion of being subjected to a differential and therefore unjust tax, and express their determination to resist its collection by every means in their power, short of actual violence. Out of a Chinese population of 45,000 souls, only 168 have applied for protection tickets. Chinese meetings have been held, whereat mandarins, decorated with gold buttons, as well as with "finger-nails an inch and upwards in length," have ventilated their oratory; Chinese processions, with banners and recusant inscriptions, have paraded about; and some long-headed Chinamen have been even hardy enough to "beard the lion in his den," wait upon the chief secretary, and wage an argumentative battle with him. Obstinacy is a quality inherent in the Chinese character, and the government may yet have a good deal of trouble in the matter, which, however, presents no features suggestive of anxiety.

The tax is now being levied with little or no difficulty. But it is certain that the popular feeling of hostility to the Chinese has been much increased by these circumstances; and it has been also exasperated by an unfortunate occurrence at one of the gold fields. A murderous attack has been made on a European storekeeper and his wife by a party of Chinese, which has resulted in the death of the former. The murderers have not yet been captured.

MAURITIUS.

Advices from Mauritius speak in the most favourable terms of the present and future prospects of the colony. Every year of late there has been an advance in the sugar crop produced, until that just ship-

ped has reached 236 million pounds, and there are 1,500 tons more to ship. The colonial revenue in the first quarter of the present year amounted to £132,139, or nearly double what it was in the corresponding period of 1853, and of this £68,226 was expended for general purposes, and £54,081 for immigration; a portion of this has, however, been reimbursed. The total value of the imports and exports, as per Customs' returns for the year 1858, was £2,785,352 and £2,209,076 respectively, against £2,391,106 and £2,303,786 in 1857. If, however, we exclude the specie, the imports in 1858 were to the value of £2,089,444, and the exports £2,122,483. The return of exports does not, however, give a fair account of the value, as many shippers place a much lower value on the sugar than the market price. While there was an increase in the amount of sugar shipped, the value of the exports last year would appear to be less than in 1857. The Mauritius papers, however, show, by careful calculation, that the value of the export of the principal staple alone in 1858 amounted to £2,679,003, being £469,924 in excess of the gross exports as given by the Customs' returns.

From a statement of the movements of the shipping in Port Louis Harbour, it appears that there has been a great increase in the trade over the previous year. The total number of ships that entered with cargoes was,—in 1857, 648, of 241,641 tons; in 1858 it was 765 ships, of 290,266 tons,—being an increase of 117 ships and 48,625 tons. Including those in ballast the entries in 1858 were 825 vessels, and 313,098 tons, of which 530 of 196,767 tons were British, and 248 ships and 93,275 tons French. The clearances comprised 646 ships of 242,162 tons with cargoes, and 160 ships and 72,776 tons in ballast. Of these vessels, 528 of 202,924 tons were British, and 235 of 89,397 tons French. The number of entries from the United Kingdom with cargoes in 1857 was 238 ships and 120,790 tons, and in 1858, 280 ships and 127,627 tons. The clearances to the United Kingdom were 195 ships of 91,414 tons in 1857, and 254 ships of 108,332 tons in 1858.

It is the free importation of labour which has advanced so materially the interests of this colony, and the proprietors of the soil, with the promise of a continuous supply of useful labourers, feel greater confidence in the stability of their property. In 1856 there were 134,271 Indian immigrants in the island, besides about 41,000 ex-apprentices. What the number imported and remaining in 1857 and 1858 was, we are not informed. But from January to June of this year 20,000 Coolies were imported into Mauritius. This rapid increase of the Indian population, and at the same time the increase of wealth amongst them, will make Mauritius almost entirely an Indian colony in course of time. There are now a considerable number of Indians born in the colony. A large number are introduced at so young an age as never to think of any other country, and the former disparity of the sexes is gradually disappearing, owing to the present colonial regulation compelling the importation of a due proportion of females. The population is no longer confined to the labourers working under en-

gagements. Only one third of the number are in this position; the remaining two thirds are enjoying all the rights and privileges of the other inhabitants, and are occupied in various ways, accumulating wealth and establishing themselves as permanent colonists.

There are, as yet, but little more than 100,000 acres under crop with sugar, while about 200,000 acres are cultivated for maize, mandioc, potatoes, coffee, fruit, and vegetables. There are 43,000 acres under pasture, 62,000 uncultivated, and 56,000 under forest. A topographical survey is to be made of the island as soon as the detachment of Royal Engineers promised by the British Government arrives. Complaints are, we perceive, made of the want of rain, arising from the destruction of forest, followed by the drying up of rivers and sources of rivers in the higher parts of the island. This is an evil felt in Barbados and other colonies which have been denuded of their timber growth in the progress of cultivation. A clearance of 7,000 or 8,000 acres of forest land a year seriously interferes with the moisture of the climate, and the Government are about to take measures in Mauritius to have the borders of rivers and rivulets planted to prevent the evaporation which takes place in a tropical climate.

The live stock on the island does not increase much, with the exception of horses and mules, being held in larger numbers; the latter are, however, still in demand; but for slaughter oxen the colonists are still chiefly dependent upon Madagascar, whence the supply continues pretty good at from 28 to 30 dollars per head. The facts we have cited speak for themselves as to the well-being of a colony not checked and interfered with by agitators, who, however honest and well-meaning, by their meddling propensities seriously retard colonial progress. If Mauritius is permitted to advance its interests, and to increase individual and national prosperity by the engagement of those willing to labour for fair wages and proper treatment, why should Demerara, Jamaica, and other colonies not be permitted the same advantages? Why should the Anti-Slavery Society consider only the well-to-do, indolent, thriftless Negro of the West, while the starving Coolie of the East, who is so anxious to better his condition in food, pay, and clothing, is utterly disregarded? Is he not a man and a brother? or must he perforce be of African lineage and woolly caput? The example of the thriving Indian population who come to and settle in Mauritius, proves how easily a resident industrious working population may be obtained for the West Indian colonies, if the planters are only permitted to carry on the immigration freely and unreservedly under the Government regulations.—*Mitchell's Maritime Register.*

NEWFOUNDLAND.

The island of Newfoundland was ceded in full sovereignty to England in 1713 by the 13th article of the Treaty of Utrecht, by which

also the French were allowed to fish from Cape Bonavista to Point Riche. About the year 1760, France, in a memorial drawn up by M. De Silhouette, claimed the right to exclude the English from fishing within the limits where the French were allowed to fish. This encroachment was successfully resisted by Lord Chatham. By the peace of Paris (1763) the privileges of the French were restored, but not extended. The Treaty of Versailles (1783) took away from the French the fishing ground between Cape Bonavista and Cape John, and gave them in exchange liberty to fish from Point Riche to Cape Ray. This treaty certainly does not give any privilege to the French, but it does contain ambiguous words, to which it is impossible to assign an exact meaning. By a contemporaneous treaty with the United States, the Americans were permitted to fish on "such part of the coast of Newfoundland as British fishermen shall use." These treaties lapsed. In 1815 the French privileges were restored, and in 1818 the United States obtained a treaty allowing them to fish on the French shore. In 1854 the Americans obtained a further treaty permitting them to fish on every part of the coast of Newfoundland. Against these treaties the French have never protested, and their claim for exclusive rights is, therefore, absurd and baseless. The French Government, however, has never given up the design avowed in 1783 of expelling the English from the western coast of Newfoundland. In 1851 a report on the Fisheries was made by a committee of the French National Assembly. In 1852 specific proposals were made by the French Government. These two papers have not been laid before Parliament, and, unless Parliament should demand them, they are not very likely to be so, for Mr. Labouchere wrote,—"There is no question on which forbearance in the production of papers is more important." The result, however, was that, on the 14th of January, 1857, a Convention was signed, which Sir B. Lytton describes as a "compromise." This compromise consisted in making over to the French an exclusive right of fishing and of using the strand on the West parts of the West coast; continued this concurrent right of fishing on the remainder of the seaboard, gave them a concurrent right of fishing on the coast of Labrador, and allowed them to purchase, and even fish for bait. Besides all this, a jurisdiction *on shore* was ceded to the French naval officers, in manifest derogation of the right of the Queen. In return for these concessions the English were to obtain an exclusive right to the worst parts of the French shore for drying their fish. This is what the Colonial Minister of the day termed a "compromise." Fortunately, the colony had the power of veto in its hands. The treaty, by its terms, required the consent of the Newfoundland Legislature; and in March, 1857, immediately on its being submitted to them, that consent was refused by an indignant and unanimous vote. It was subsequently agreed that a Commission should sit, composed of French and English officers, &c., to take evidence and report. The British Commissioners have been at their post for six weeks or more beyond the time appointed, but here are no signs of the French Commissioners.—*Mitchell's Maritime Register.*

CAVERN RESEARCHES,—*or, Discoveries of Organic Remains, and of British and Roman Reliques, in the Caves of Kent's Hole, Anstc's Cove, Chudleigh, and Berry Head. By the late Rev. J. MacEnery.* Edited from the Original Manuscript Notes by E. Vivian. Simpkin, Marshall, & Co.

One of the most interesting caverns in the world lies within a lady's walk of that sunny watering place, Torquay. In a scene of geological disorder, rises the mass in which Kent's Cavern is situated, half-way between St. Mary Church and Torquay, and about a mile distant from each. Approaching from Torquay by a lane which terminates in a wooded valley, flanked on both sides by ridges of limestone, the cavern lies on the right. The way to it is over a stony gap, and winds through brushwood to its front. Grey masses of stone are scattered down the sides, and seem about to roll from the brow of the hill. Rugged and crevieed surfaces, together with stratification, partly vertical and partly horizontal, seem to be proofs of an igneous disturbance which at some remote period produced the cavern. But water succeeded fire, and the aqueous deposits of a later period line the cave with those fantastic percolations of water which are termed stalactites when they depend from the roof, and stalagmites when they protrude from the floor.

The favourite entrance to this cavern is simply a cleft in the rock, shaped like a reversed wedge, about seven feet wide at the bottom and five feet high. When the accumulated rubbish was cleared away from the entrance, the interior was found to rise rapidly, and to spread out into a spacious vault, while the rock floor was polished as if by constant use. A regular and determined exploration was made by Mr. MacEnery, Chaplain at Tor Abbey, through what he names the direct course of the upper gallery, and its lateral branches or sally-ports. He then returned on his steps as far as the vestibule or sloping chamber, and, without stopping, advanced by the arcade into the cave at the extremity, from which he turned on the left into the region of the Bear's Den. Thence again returning by the oven, and retracing his steps by the arcade, he traversed once more the sloping chamber in his way to the Wolf's Den, which forms its right branch, and terminated his labours in the grand vestibule or Hyena's Den. Unfortunately, no sort of illustration makes this order of travel clear to the reader, and he must imagine it as he best can.

Ordinary tourists visit caverns for the purpose of admiring the sparry concretions (the stalactites and stalagmites) that frequently adorn them with the most singular shapes. Kent's Hole is not destitute of these natural ornaments, yet does not abound in them so remarkably as some other caverns. In the upper gallery, the concretions at the roof appear like clusters of cones, disposed at regular intervals, like the pendents of a Gothic screen, connected by a transparent curtain of stalactite. While the mere tourist would admire the natural architecture, and heed nothing beyond its beauty, the geologist is

chiefly attracted by it because it has rendered him the invaluable service of sealing down the floor hermetically, and preserving the precious deposits of animal bones beneath through many centuries, without permitting natural decay or accidental disturbance. How singular this result! Century after century of ceaseless droppings of water, charged with lime and impregnated with carbonic acid, have been necessary to weave a once aqueous, now solid and hard, covering for the gathered bones of many a beast of prey. What, in fact, is the whole but a rude sarcophagus of alabaster for the quadrupedal tyrants who once ruled these wild wastes, and held their carniverous feasts within these walls! Slow, indeed, but sure, was the infiltration through every crevice of the roof of the lime-charged water, dropping, it may be, only a few drops gradually upon the point of a protruding cone, but continually augmenting its sediment, flowing down the sides of the mound, spreading round its base, forming zone after zone like circles in the water, until it was met by the concentric lines of adjacent cones forming and advancing in like manner. Finally, the whole surrounding space became one continuous sheet of stalagmite, enveloping the bones, swathing them as tightly, and securing them as perfectly, as if they had been rolled in the mummy-cloth of Egypt, and committed to the recesses of a mighty pyramid.

Such was the Bear's Den in Kent's Hole,—the most interesting part for its organic treasures. So hard was the floor that attempts to penetrate it were abandoned in despair, until by following the cracks that traversed it like a pavement a flag was turned over, and groups of skulls and bones were found adhering to the stalagmite. Succeeding flags were upturned exhibiting like interesting objects. The place was evidently an ursine cemetery—intramural, indeed, as respected rock walls, but extramural as regarded all habitations of town-loving man. Here the remains of the bear prevailed to the exclusion of all others. The bones retained their natural freshness, as if they had been derived from animals in a high state of vigour; while some of the teeth displayed dazzling enamel. Two skulls were buried in the stalagmite as in a mould, and were brought away in that state. The unbroken condition of most of these remains appeared to indicate that they belonged to animals that died a natural death in this spot during a succession of ages.

The most interesting part of the cavern next to the above was the Wolf's Passage, at an opposite extremity. At this point roof and floor nearly met, and it was always regarded as the extreme limit of the cavern, until by removing heaps of loose stones a passage was opened to a small group of chambers, probably untrodden before by the foot of mortal man. A column of spar connecting roof and floor being removed, it was found, to the explorer's inexpressible joy, to have covered the head of a wolf—"perhaps the largest and finest skull, whether fossil or modern, of that animal in the world." Near it lay one of its under jaws entire,—the other could not be recovered even by the most diligent search. In the chambers beyond was a grotto hung with concretions of dazzling brilliancy. Returning to the

site where the wolf's head was found, the stalagmite was discovered to be a foot and a half thick, excessively hard, marked by mixture of rolled rocky fragments, but in the interior moulding itself purely upon a mass of bones. These were so thickly packed together that no idea of their number could be given. They had suffered from pressure and had been impelled by violence into this narrow neck of the hollow. Some were even driven into the interstices of the opposite wall; others were piled in the greatest confusion against its side. From this spot alone Mr. MacEnery obtained nearly the half of his whole collection. Here he gathered some thousands of teeth of the horse and hyena, and in the midst of all were myriads of Rodentia. The earth was saturated with animal matter; it was fat with the sinews and marrow of more wild beasts than would have peopled all the menageries in the world.

In the Cave of Rodentia it was found that the remains and dust of this class of animals constituted the whole floor, and that they were agglutinated together by calcareous matter into a bony brecchia or conglomerate. Not only had their tiny remains penetrated into every cleft and crevice of the rock, but they had even insinuated themselves into the chambers of the large bones. Here, then, were myriads of minute animal remains adcumulated by the side of those of the elephant, rhinoceros, and hyena in one common sepulchre. When a handful of the dust was thrown into the air hundreds of teeth rose to the surface, and only in this way could they be collected. Land and water rats *(campagnols)*, bats, weasels, and moles, had all left innumerable remains on this spot. That they all existed and died here was made manifest by the condition of their remains, every part indicating prolonged habitation and peaceable death. Such a congregation of Rodentia is an *à priori* argument in favour of the existence of a depot of offal in their neighbourhood.

The distribution of animal remains over the whole cavern may be thus summarily stated. The ancient floor of the cavern was covered with the remains of the hyena, bear, and campagnol,—the two latter occupying its opposite extremities, the former occupying the remainder and the centre and the upper gallery. The Bear's Den was exclusively ursine, and thus resembles the caverns of Germany. The cave of the Rodentia was chiefly inhabited by the campagnol. The great body of the cavern was occupied by the hyena, while in addition to the remains of its own species, which perished by a natural death, there were found remains of its prey, accompanied by other evidences of the conversion of the cavern by hyenas into a favourite den, resembling that of Kirkdale in Yorkshire, so well explored and described by Dr. Buckland in his *Reliquiæ Diluvianæ*. So much of Kent's Hole, which is by far the most interesting of the caverns in this district. The above description of the one must suffice also for the other and less important caves mentioned in the title.

Such a cavern as this is not merely a study for the geologist, but offers a subject for descriptive poetry. Here is an outline of the suc-

cessive scenes which might be graphically purtrayed. The poem opens with a description of primeval convulsions and disorder prevailing over the whole district. Water has abraded the rocks for long ages, during which limestone and conglomerate have been deposited. But now the resistless power of fire has burst through these rocks, and a fiery rock (trap) pierces through the limestone, bends over it, and ultimately engulphs in its own boiling mass huge pieces of limestone and shale. By the action of elastic gases, and a consequent upheaval, a fearful rent is made in the rocks, and two opposite masses are hurled together, their summits meeting and their lower extremities receding from each other, so that the opening to a tortuous and deeply severed interior is produced, and stands unclosed for succeeding ages. A long period of repose ensues, during which this cavern is becoming slowly furnished with nature's drapery, and crystal carpet, and varied ornaments. Now succeeds another scene. Beasts of prey roaring over this desolate and craggy wild, find the cavern and make it their dwelling-place. After a life of predatory warfare they perish and leave their own skeletons on the floor, mingled with the bones of those they preyed upon. Mangled bones of a multitude of herbivora and carnivora mark their residence and tomb, and around are scattered vast quantities of excrementary deposits. Now flows in, impelled from without, a mass of mud, sweeping along and confounding gnawed and disjointed bones, and skeletons lying thickly upon the floor. Rolled fragments of rock are also dashed into the hollows by tumultuous waves from the rising ocean, and with these, splinters of bone are forced into the softer clay, now become hard rock. Other animals find these recesses to be convenient haunts. The bulky bear has now discovered them, and the sly wolf and the ferocious hyena have made good a home in distinct chambers. In the perpetual night of these dismal hollows each wild animal follows its own instincts, and crunches its own prey, and howls or screams as it pleases, till all the hollow deeps resound again. But tiny creatures are not afraid to make an entrance here. Bats fly about in the darkest corners, land and water rats creep and run in numerous tribes, and countless rodents gnaw the bones of creatures which when living would have crushed them by a paw-stroke. Water is still ever percolating drop by drop, and minute by minute; concretionary cones are continually forming and extending; and the generations of animals are all finally wrapped in a semi-transparent winding-sheet that spreads over the whole floors of the chambers.

Ancient as was the formation of the cavern, its chronology extends over an immensely lengthened period, as measured by our arithmetic. And now within these rocky portals enters the crowning creature of all animal races—MAN. True, he comes but in savage state. He is a boar hunter, armed with flint-headed spear, and he follows his prey into the very recesses of the cave. There also he leaves tokens of his presence. Later still, others of his race succeed him, and kindle large fires and hold rude revels within these shadowy haunts; and leave frag-

ments of plain and ornamental pottery to attest their art and their orgies. The feasts of wild beasts have been succeeded by the feasts of men. The howl and the scream of the one are replaced by the song and the speech of the other. Other human visitors succeed these, and bequeath superior and richly embellished pottery, beads of opaque glass, shell-necklaces, rings and amulets and crumbling pieces of skeletons. Now, sun-baked urns, fragments of breastplates, heaps of shells, and pins and bodkins of bone, indicate the visits of Britons—perhaps Romanized Britons. Here, in one stalagmite, are fragments of a human cranium and teeth. There lie innumerable flints, chipped and edged, and shaped into wedges for various purposes, especially for arrow and spear heads. At this stage we seem to pause in human visitors.

Ages pass on,—Rome falls,—Britain rises,—England becomes one of the chiefest countries in the world, her sons cultivate all arts and sciences,—knowledge of the past and researches into antiquity distinguish even the high-born and noble of the land,—and now this cavern, the scene of so many and such extreme vicissitudes, is entered by a priest, accompanied by men who wield good steel and iron implements. Fired with antiquarian zeal, they tear up the floor,—they exhume the dead,—they open the graves of unknown quadrupedal generations. Under the glare of torch-light, they rifle the long uninvaded solitudes of stalagmitic sepulchres. Skulls, jaws, and teeth are born in triumph from the despoiled cave. The priest fills his museum with them. Lords, bishops, and commoners admire these *spolia opima;* but the priest also descends to his sepulchre; and now another despoiler succeeds him, the auctioneer. In one day, under successive descents of his hammer, the accumulations of tens of centuries are dispersed. A few silver coins secure possession of the bones of quadrupedal tyrants. Inestimable remains are divided into lots and assigned to forty different owners. Countless animals had been drawn to this central cave, and are now distributed to distant cabinets and museums, never to be gathered together in one place again. A partial exception occurs once. On an appointed day, a tall, slim, smiling professor enters a lecture theatre, and is received with plaudits. On the table before him are placed imperfect skulls, jawless teeth, and toothless jaws, and shattered and gnawed bones. The professor waves his wand, and revivifies beast after beast, and with them repeoples the cave, their primæval palace. After the lecture, would-be-wise men and beautiful women descend to the table, and jaws once reeking with the blood of mangled prey are handled by gloved hands, and touched by fair fingers, and admired by sparkling and speaking eyes. This is the last at empt at a restoration and resurrection of these cavernous organisms. They now return to their places in museums, are ranged upon orderly shelves, inscribed with unpronounceable names, and gazed on by the descendants of those Britons who once feasted upon their undisturbed tomb. In their new resting-place they will probably remain unmolested until that day arrives when the earth shall experience another convulsion and a last rending,—when the bones of priests and profes-

sors, fair women and forgotten men shall be mingled with the dust of bears, hyenas, and beasts of all orders, by the common and final catastrophe which awaits all living things, and even this great globe itself! Are there not themes enough for poetry here? Kent's Cavern might be a cavern in Parnassus, if only there were a poet to enter it.

SANDWICH ISLANDS—*The Volcano—Snow-Storm—Waterfall.*

Waimea, May, 3rd, 1859.

Mr. Editor,—I take advantage of the departure of the *Mary*, which sails for Honolulu to-morrow, to forward you the latest advices from the eruption.

The volcano continues still in action. A considerable stream of liquid lava is nightly visible from Waimea on its descent towards the sea, near the track of the former flow. The head of the stream has now arrived to within fifteen miles distance of the shore. Its progress is slow; and, judging by its rate during the past week, a fortnight or three weeks will elapse before it quenches its redness in the waters of the ocean. If nothing happens to arrest or divert its course, it will probably reach the water at a point a little to the southward of Wainanalii,—the spot where the old stream entered the sea. Probably a length of fifteen miles of the glowing red hot stream is visible in the night from Waimea,—the fire extending from the head or front of the flow, up the mountain, about half way to the old craters. The two upper craters continue to send up immense volumes of smoke, and on Friday night last, the 29th of April, one of the lower craters was distinctly observed to throw up considerable jets of lava into the air,—thus showing conclusively that old Pele "still lives."

The weather of late, in this elevated region, has been quite cool and rainy. On Friday last the summit of Mauna Kea was the scene of a violent snow-storm, which wrapped a large portion of the mountain in a robe of shining white. The storm was accompanied, as is frequently the case, by thunder and lightning.

Besides volcanoes and snow-storms, the island of Hawaii possesses, as is well known, many other natural curiosities, among which its waterfalls are not the least interesting. In northern Hawaii there are, scattered here and there, many remarkable falls and cataracts, some of which, for beauty and sublimity of surrounding scenery, possess few parallels in the world. The valley of Waipio which in itself forms one of the most interesting natural wonders of the island, possesses two of these waterfalls One of them, near the mouth of the valley, visible from the sea, and said to be twenty-five hundred feet high, possesses a world wide reputation. The other one, situated at the head of Waipio valley, at a distance of some eight or ten miles from the sea, is, although not its rival in height, by far the most beautiful and perfect fall. At this point the precipitous sides of the valley, assuming a perpendicular position, approach each other in a regular curve and join, so that the valley suddenly terminates in a large basin, surrounded by smooth perpendicular and overhanging rocks, rising to a height of fifteen hundred feet, and forming a sort of huge chimney, over the top of which pours the main body of the Waipio River. The water rushes over the brow of the rock in one broad regular stream, and falls in an uninterrupted sheet to the bottom, and thence, flowing forth from the deep round pool that receives it, dashes and roars away down the valley among the rocks. The huge precipices, the

thundering waters, the dancing rainbows, the blackness of the great cave beyond the pool and behind the fall, and the many varieties of bright coloured ferns above and on either side, form a rare combination of attractions. An artist would seldom meet a more glorious subject for a pencil.

This beautiful fall is, unfortunately very difficult of access. The route up the valley is rough and in some places dangerous. The traveller will be up to his waist in water a great portion of the time, and in one place, for a brief distance, swimming is the only method of progression. Probably few whites have ever visited the spot. The lover of natural beauties, however, if he is stout enough of limb to overcome intervening obstacles, will be richly rewarded for his labours, by a visit to the head of Waipio Valley.

Pacific Commercial Advertiser. J. H. S.

New Books.

AN ESSAY—*on the Cause of Rain and its Allied Phenomena. By G. A. Rowell, Hon. Mem. of Ashmolean Society, Oxford.*

Those of our readers who take delight in the vast subject of Meteorology, may look into Mr. Rowell's book with advantage. They will find ample matter to engage their attention, even in knocking down old theories on this wonderful subject, and setting up another reasonable one in their stead. Although we are more satisfied with Mr. Rowell's attributes to the enormous power of electricity in the formation of clouds and all that has to do with that canopy of curtains which are provided by an All-wise Creator to prevent suffering from the effects of the sun's rays, we are not so much so with *his* hurricane theory.

It was enough for Redfield to work with facts, and for seamen to profit by them, as they have done, in avoiding the disasters from them which were common at sea before he wrote. We have much respect for Mr. Rowell's opinions, but before he reasons on their origin and formation, he would find safer ground on which to reason in collecting facts concerning them than that on which he endeavours to controvert the present theory. The labours of Piddington and Thom, and before them, Redfield and Reid, will supply abundance of material, besides the pages of this work. Whatever the cause and origin of these phenomena may be, they have established as facts those traits of character by which they are successfully avoided, and by which it may be seen that they move onward in the direction of certain ocean currents, and are seldom stationary. We commended the foregoing authors to our readers long ago.

Nautical Notices.

CUBA LIGHTHOUSES.—The intended light on Cayo Cruz del Padre, has been finally abandoned, all endeavours to lay the foundation having failed. It appears to be the intention to place a light on Cape Lucretia, the tower to be of stone 120 feet high, the light a first class Fresnel, revolving; but it is not yet commenced. As soon as the tower on Cayo Bahia de Cadiz is built, the light will shortly appear.

Guano Islands.

Washington, March 5th, 1858.

Noticing a few days since that Clipperton Island had been proclaimed to the world as belonging to the Emperor of France, and as this guano question has become one of the first moment, it has occurred to me it would not be uninteresting to your readers to know if any, and how many guano islands in the Pacific Ocean or elsewhere have become the property of citizens of the United States, and have been recognized by the Government as pertaining to its territories under the act of Congress approved August 18th, 1856.

The following is believed to be a correct list of said islands, and their several latitudes and longitudes, viz.:—

	Lat.	*Long.*		*Lat.*	*Long.*
1. Bakers ..	0° 15′ N.	176° 21′ W.	26. Penrhyns	8° 55′ S.	157° 7′ W.
2. Jarvis ..	0 21 S.	159 52	27. Pescado .	10 38 „	159 20
3. Holland .	0 50 N.	176 52	28. Ganges..	10 59 „	160 55
4. Maldens .	4 15 S.	155 0	29. Rierson..	11 11 „	160 53
5. Arthurs .	3 32 „	176 5	30. Siderons .	11 5 „	161 50
6. Christmas	1 53 N.	157 32	31. Humphreys ...	10 40 „	160 52
7. Caroline .	9 54 S.	150 7	32. Frances .	9 58 „	161 40
8. Anns....	9 49 „	151 15	33. Flint....	10 32 „	162 5
9. Stavers ..	10 5 „	152 16	34. Nassau ..	11 52 „	165 90
10. Flints ..	11 26 „	151 48	35. Danger..	10 0 „	165 56
11. Baumans.	11 48 „	154 10	36. Mary Letitias ..	4 40 „	173 29
12. Rogeweins	11 0 „	156 7	37. Kemins..	4 41 „	173 44
13. Gronique.	10 0 „	156 44	38. Walkers .	3 58 N.	149 10
14. Frienhavn	10 0 „	156 59	39. Sarah Anne	4 0 „	154 22
15. Quiros ..	10 32 „	170 12	40. America .	3 40 „	159 28
16. Low	9 33 „	170 38	41. Prospect.	4 42 „	161 33
17. Clarence .	9 7 „	171 40	42. Samarang	5 10 „	162 23
18. Favorites.	2 50 „	176 40	43. Palmoore.	5 43 „	162 20
19. D. of York	8 30 „	172 10	44. Danger..	6 30 „	162 32
20. Farmers .	3 0 „	170 50	45. Makin ..	3 2 „	172 46
21. Birnies ..	3 35 „	171 39	46. Mathews.	2 3 „	173 28
22. Phœnix .	3 40 „	170 52	47. Davis ...	6 40 „	170 10
23. Marys ..	2 53 „	172 0	48. Barbera .	3 54 „	173 0
24. Enderburgs	3 8 „	174 14			
25. Sydney..	4 24 „	171 0			

The two first named islands have been claimed by the American Guano Company, and the rest by the United States Guano Company, and other citizens of the United States.

I understand these acquisitions are all to be surveyed and chartered, and the quality and quantity of the guano thereon to be ascertained by competent analytical chemists and topographical engineers, and a report thereof made to Congress at the earliest practicable period. At some of these islands there are good harbours and safe anchorage, and at most of there is a good lee, which, coupled with the fact that most of them are situated where storms are seldom known, (the prevailing winds being from the East,) makes them places of safe resort for ships.

The quantity and accessibility of the guano on many of these islands is placed beyond doubt. What remains to be demonstrated is its quality, and whether that is such to warrant its importation. On this point I am not competent to decide, because there are two theories which now divide the opinions of scientific men, viz., the ammoniacal and the mineral. The former advocated

by Laws, Gilbert, Johnson, and others, and the latter by Liebig, Gale, and others, who claim that it is nutrition not stimulus which is the great desideratum. The guano from these islands comes under the last head; the Peruvian, Elide, and Ichaboe under the first. Time will settle which theory is correct.

A gentleman who is well acquainted with the islands of this ocean, gives us some information in regard to some of those claimed above, which it may be well to state here. 1st.—Arthur, Favourite, and Farmer Islands do not exist. 2nd.—Walker, Sarah Anne, Samarang, and David Islands are of doubtful existence. All the above are laid down on the charts, it is true, but probably none of them exist. 3rd.—Flint, Clarence, Duke of York, Rierson, and Humphrey Islands are all inhabited, and possession of them cannot very well be taken by foreigners. Sydney Island is covered with trees or woods. Christmas and Caroline Islands are partly covered with cocoanuts and are known not to possess guano. That there may be guano in abundance on many of the islands claimed, is very likely, but the best deposits will probably be found to exist on small rocky islands, as yet perhaps undiscovered.

New York Tribune.

Referring the above to the chart, we find,—

1. Baker is Phœbe or New Nantucket of the chart.
2. Jarvis, same in chart.
3. Holland. A Howland or Phœbe Island seems to be placed as doubtful about fifty miles S.W. of this position.
4. Maldens. Maldon is fifteen miles North of this position in chart.
5. Arthur—same in chart.
6. Christmas—in chart.
7. Caroline—in chart a trifle West.
8. Anns—new.
9. Stavers—called Vostock in chart.
10. Flints—in chart.
11. Baumans—new.
12. Rogewein—in chart.
13. Groningen—in chart.
14. Freinhaven — Teinhoven, twelve miles S.S.E. in chart.
15. Quiros—new.
16. Low—South part of Bowditch Island in chart.
17. Clarence—Nuku-Nono of chart.
18. Favorite—new.
19. Duke of York—perhaps meant for Oatafou, ten miles S.W. in chart.
20. Farmer—twenty-four miles E.N.E. of Enderburg Island of chart.
21. Birnies—in chart.
22. Phœnix — about twelve miles S.S.E. of that in chart.
23. Marys—new.
24. Enderburg—placed in same lat. and 3′ to the eastward in chart.
25. Sydney—20′ East of that chart.
26. Penrhyn—1° 8′ East of that in chart.
27. Pescado—12′ S.b.E. of that in chart.
28. Ganges—new.
29. Reirson—seventy miles to southward of that in chart.
30. Siderons—10′ S.E. of that in chart.
31. Humphrey—15′ S.E. of that in chart.
32. Frances—new.
33. Flint—new.
34. Nassau—doubtful longitude.
35. Danger—island in chart far to E.S.E.
36. Mary Letitia—new.
37. Kemins—new.
38. Walker—about 10′ N.E. of that in chart.
39. Sarah Anne—in chart.
40. America—new.
41. Prospect—new.
42. Samarang—in chart.
43. Palmyra—in chart.
44. Danger—in chart.
45. Makin—new.
46. Mathews—new.
47. Davis—new.
48. Barbara—new.

The Wreck of the Paramatta.

The following, furnished by one of the *Paramatta's* passengers, is extracted from a Jamaica paper:—

We left Southampton with a fair wind, and were soon running down the Channel at the rate of eleven knots an hour. Her great length, sharp bow, and straight cutwater, sent her through every opposing wave without a single spray to wash her deck, or a solitary motion to disturb her steadiness. As a ship she is one of the most perfect models I have ever witnessed, having all that could be conceived, not only for the supply of every luxury and convenience, but likewise for security in danger. Her cabins are large and well ventilated, having many conveniences wanting in the other ships of the company. The saloons are perfect drawingrooms; so cool that, notwithstanding the warmth at this season of the year, wind-sails were wholly unnecessary. The motion of the ship and the vibration of the engines were perfectly imperceptible, so that it was almost impossible by that means to ascertain whether the ship was in motion or not. At the early part of the voyage, when laden with 1,500 tons of coal, we were running 275 miles a day, which speed increased as we grew lighter (we were burning from 100 to 109 tons of coal per day) until we attained a speed of from 294 to 305 miles a day.

The enormous difficulty with which the captain and officers had to contend in this their first voyage in the *Paramatta* was the ship's iron, which caused the compasses continually to change from their proper points, keeping the officers incessantly calculating and observing the local deviation, so as to properly navigate the ship. The attention and watchfulness of the captain and chief officer in the observation of the compasses daily was the constant remark of the passengers, who more than once declared that in all their voyages and experience, they had never witnessed greater precautions than those evinced.

All proceeded most delightfully until Friday, the 24th, when our wheel came upon a sunken vessel, which, being below water, was unobserved by the watch. An iron girder was wrenched like a wire, and the huge boss was rent to the very axle. The *Paramatta* was instantly brought to a stand for repair, which occupied some seven hours in the lashing of chains to the axle, to preserve her from further accident by strengthening the shafts to which the floats were secured.

On the evening of Thursday, the 30th, when anxiously looking for land, and expecting momentarily to sight Sombrero, the captain refused to leave the deck, even at the repeated solicitations of the passengers, replying at every request, "I never go down stairs when we're making land." Thus these officers continued taking sights and watching for land from three o'clock until ten, when suddenly the ship struck the ground and told us we were on shore, and for the first time we discovered we were out of our proper track. Great uneasiness prevailed as to our safety, seeing it was a matter of uncertainty whether the ship was making water or not; but she was afterwards discovered all right, and fear began to subside.

Captain Baynton immediately despatched an open boat, in charge of Mr. Parry, the second officer, for St. Thomas, to bring up the steamers to our assistance without delay. It was not until four o'clock the next morning that Mr. Parry, after unwearied efforts to clear the reefs, managed to get into deep water, after having been on the rocks almost every half hour from the time he left; but, once clear, he set sail, reaching St. Thomas about ten o'clock on Friday night. At about eight o'clock the same evening the *Wye*, steamer, hove in sight, and answered our signals from the *Paramatta*.

Submarine Telegraphs.

A public meeting, convened by the Mayor, has been held at Liverpool, to hear a statement from the chairman of the Atlantic Telegraph Company in reference to its present position and prospects. Mr. Wm. Brown occupied the chair, and Mr. Stuart Wortley, chairman of the company, explained its present position. As must be well known from previous published statements, the company has been invited by her Majesty's government to unite with them in a series of important experiments to determine, by actual test, the various questions upon which there is any difference of opinion relative to the insulation and composition of cables for deep water. The investigation of these matters will immediately commence, under the superintendence of Captain Galton, R.E., of the Board of Trade, advised by Mr. Robert Stephenson, M.P., and Professor Wheatstone, and assisted by the staff of the Atlantic Telegraph Company.

The cable will be constructed and laid on the following terms, which in June, 1857, could not have been obtained at any cost:—Contractors of high respectability are ready to make and lay down and work the cable at their own risk. Separate books of account to be kept to ascertain accurately the cost of making and laying. These books to be audited by the company, and the contractors' profit on such making and laying to consist of a commission or per centage on the total cost, as finally shown and settled in the account. When the cable has been laid, and when messages have been sent and received through it in a satisfactory manner for thirty days, this profit is to be paid; but if the cable should fail in any respect the whole profit is to become forfeited, and not only is the whole profit to become forfeited, but a further forfeiture of large amount will be submitted to, as a penalty, in actual cash; which latter sum would previously be held as security out of the cost until the accomplishment of the work. The contractors would also consent to take a portion of the absolute cost of the cable in preferential shares. A policy of insurance to be taken out to cover the sea risk of submerging the cable.

The Submarine Company's cable from Weybourne to Heligoland and Denmark has been placed in telegraphic connection with Cromer, in Norfolk, and Westerhever, on the Danish coast, and signals have been interchanged. The speed secured has been excellent, and indeed the length of the line has not appeared to materially affect the actual working speed, which is equal to that attained on ordinary lengths of submerged or subterranean wire. The directors of the company, on the successful completion of the undertaking, forwarded the following message to the King of Denmark:—

"The directors of the Submarine Telegraph Company beg to offer their very humble but sincere congratulations to his Majesty the King of Denmark on the union by telegraph of his Majesty's dominions with Great Britain."

To this his Majesty graciously returned the following answer:—

"His Majesty the King has ordered me to express to the directors of the Submarine Telegraph Company his thanks for the communication about the fulfilment of the union by telegraph of Denmark and Great Britain, which undertaking will be of considerable importance for the interest of the two countries.—Hall."

Communication has been constantly maintained with Heligoland, and by way of scientific experiment, that island has been placed in connection with Hanover, there being 340 miles of submarine cable and 9 miles of land line between Heligoland and Cromer, and 280 miles of cable and 11 of land wires between Cromer and Hanover. The cables and land wires placed in one circuit in relay made a total of 620 miles; and through this great length perfect signals were interchanged with very great rapidity.

TESTIMONIAL TO THE CAPTAIN OF THE "SARAH SANDS."—A meeting has lately taken place at the offices of the Oriental Steam Packet Company, Southampton, for the purpose of presenting a testimonial to Captain Castle, the commander of the steam transport *Sarah Sands*, which it will doubtless be recollected took fire in November, 1857, in the midst of a gale of wind, several hundred miles from land, when, but for the exemplary conduct displayed by her commander, all on board would probably have perished. A subscription was set on foot by the Mercantile Marine Association, which resulted in the meeting of Tuesday, and the presentation of the following address:—

Dear Sir,—The accompanying gold watch and purse containing £150, are presented for your acceptance. The amount has been raised by the admirers of your conduct on the occasion of the burning of the *Sarah Sands*, steam transport ship, at sea. The subscribers feel that it was, under Divine Providence, due to your cool and seamanlike conduct, aided by the courage and discipline of the troops on board, that the ship and the 450 souls in her at the time of the disaster were saved. It will be satisfactory to you to know that among the subscribers there has been only one feeling expressed, namely, admiration of your conduct, and regret that such a public service as yours has not yet met with a suitable reward from the government of the country. With hearty and sincere wishes for your future prosperity—We are, dear sir, on behalf of the subscribers, yours most faithfully, &c.

To J. S. Castle, Esq., late Commander of the steam transport ship "Sarah Sands."

See *Nautical Magazine* of last year for the narrative.

CHARTS, *&c., Published by the Hydrographic Office, Admiralty, in August, 1859, and Sold by the Agent, J. D. Potter, 31, Poultry, and 11, King Street, Tower Hill.*

France, West and N.W. coast, sheets Nos. 1 to 5, 9, and 10, Pilote Francais, (each, from 5s. to 2s. 6d.)

France, West coast, Brest Roadstead, Pilote Francais, (5s.)

Breton Island, Little Bras d'Or Lake, with St. Anne and Sydney Harbours, Captain Bayfield, R.N., 1857, (4s.)

Egypt, Alexandria to Damietta, Comdr. Mansell, R.N., 1857, (4s.)

Egypt, Damietta to El Arish, corrected to 1859, (4s.)

Newfoundland Island, Trinity Bay, Bull Arm, Capt. Otter, R.N., 1858, (3s.)

West coast North America, San Juan and Fuca Strait, Haro and Rosario Straits, Capt. Richards, R.N., 1859, (5s.)

Australia, East coast, Moreton Bay and views, corrected by Capt. Denham, R.N., 1859, (2s.)

New Zealand. Cook Strait, Harbours and Anchorages, Capts. Stokes and Drury, R.N., 1853, 2 sheets, (each, 4s.)

Pacific Ocean, Fiji or Viti Group, Captain Denham, R.N., and Comdre. Wilkes, U.S.N., 1840–57, (5s.)

Sailing Directions, &c.

Scotland, N.W. coast. Little Minch, Capt. Otter, R.N., 1859, (3d.)

China Pilot, Appendix No. 2, edited by G. Marsh, Esq., R.N., 1859, (2s. 6d.)

New Zealand Pilot, 2nd edition, F. J. Evans, Esq., R.N., 1859, (5s.)

Rules for Finding the Distances and Heights at Sea, by the late Lieut. H. Riper, R.N., 4th edition, 1859, (3d.)

Belgian, Danish, Swedish, Norwegian Prussian, Russian, &c., Lights, corrected by Comdr. Dunsterville, R.N., to August, 1859, (1s.)

Admiralty, August 20th, 1859.

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

OCTOBER, 1859.

A Few More Words on Lunars.—*By Captain Henry Toynbee, F.R.A.S., Commander of the E.I.S. "Gloriana."*

In sending another paper on lunars to the *Nautical Magazine*, my object is not to bolster up a tottering subject, which the advancement of science causes to be no more requisite, but to maintain the fact that lunars are the only method for finding the longitude, available at sea, independent of delicate machinery so liable to suffer from a stroke of the sea, changes of climate, or the effect of iron, as is the chronometer. It may be considered that lunars are to chronometers what the mercurial barometer is to the aneroid or sympiesometer, i.e., a natural standard with which they ought to be constantly compared; to prove which let us consider the following facts.

The last paragraph in my paper on the Westerly Route across the Line, in the *Nautical Magazine* for April, 1859, shows that chronometers do sometimes go very badly.

I have just heard of another ship having run on the South coast of Africa, thinking she was to the westward of the Cape land,—how often has this happened!

Again, the following quotation from a letter by Captain Shaw of the *Clive*, speaks to the point:—

Clive, Madras, July 8th, 1859.—While writing, I cannot refrain from expressing to you the comfort and pleasure I have experienced from that valuable piece of navigation that I learnt from you,—the method of rating chronometers by lunars. I have always followed it up since leaving you, and with the greatest success; I have two in-

different chronometers, but am glad to say that during my command of the *Clive* we have always made the land with the greatest accuracy. This passage out was a more striking example than any other; for although I consider myself a very indifferent observer, there being such a wide difference in the results of my observations East and West of ☾, and several times on the passage out when the sun was in distance I had not an opportunity of getting any sights, still we found the chronometers were altering their rates most considerably; one by the time we had rounded the Cape having changed from losing 3·3s. daily to losing 7·8s., and the other from gaining 3·5s. daily to gaining 1·0s.; having checked them every opportunity when lunars could be obtained, we stood in to make the Sadras Hills, and spoke a ship from Madras the same morning. You may imagine how pleased I was to find that when he showed me his longitude we agreed to a mile. And an hour afterwards we sighted the Sadras Hills. The last land we had seen was the Lizard Point, on February 19th. How any man can doubt this method I cannot conceive, for I always use my lunar rates with the greatest confidence."

I received a similar letter from Captain Quihampton of the *Tudor*, and the results of his observations were published in the *Notices of the Astronomical Society* for January 12th, 1855.*

In remarking on my paper the Editor says:—

"It is to be feared that, partly from the practical difficulty attending lunar observations, and partly from the extended use of chronometers in navigation, this excellent and independent method of finding the longitude is going out of use. Yet in long voyages it must always be dangerous to rely solely on chronometers, unless they are numerous and have been rated *with reference to the temperature*, which is not the practice of private raters. Even then there are so many causes which may operate to change the rates of chronometers at sea, that a conscientious officer ought never to risk his ship and the lives of his crew upon the going of his chronometers, without the additional check and security which he derives from lunars."

Another friend writes,—"I am glad to get any wrinkle on lunars, for I place the greatest confidence in them."

Now why should these men so add to the safety of their ships and the lives of those on board, when others are allowed to take three or four hundred souls under their charge (a few months ago I had seven hundred in my ship) without understanding this check on chronometers. Who has not read of the ship full of emigrants which ran stem on to the island of St. Paul when they were so sure of having passed it that the officer in charge of the deck, though he saw the land, took it for a black cloud rising ahead. Now, had the commander of that ship been a lunarian and understood the method of meaning lunars East and West of moon, he could hardly have done this.

* Previous communications on this subject will be found in the Monthly Notices, Vol. ix., No. 7, and Vol. xiv., pp. 19 and 243.

If the present state of education requires that some men should be allowed to command ships who do not understand lunars, still that knowledge ought to be a *sine quâ non* in ships carrying a large number of human beings.

In arguing thus it is not meant that there are not many men who by their experience and many other good qualities are made superior to others, who, though they understand lunars are not their equals in any other point which tends to make a first rate commander. Yet no one will say that these men would not be better still if they understood how to fix their ship's position by lunars.

"The proof of the pudding is in the eating of it," and any man who by long practice has proved himself well able to command a ship, should not be interfered with. But from young men I would require lunars before they should be allowed to command a ship carrying troops or passengers of any kind, until a better method of finding the longitude, independent of chronometers, has been discovered.

It has, moreover, been brought to notice that the introduction of cheap chronometers has made them not so trustworthy as they were some time back; but be that as it may, every sailor ought to have lunars available as a check on chronometers.

Even steamers which make short voyages and keep their chronometers on board, would find great advantage in rates deduced from lunars of different voyages.

I am the more earnest on this subject because the present examination of masters in the merchant service makes lunars something extra, so that young captains are not required to understand them, and it is well known that numbers will only learn what they must.

From very high places, too, we read of "the classic lunar," as if it was quite a thing of the past; so did lovers of aneroids speak of the mercurial barometer, and it seems to me with the same amount of reason.

In fact, it is feared that lunars are dying out, with no natural method for finding the longitude at sea to take their places, and this at a time when it has been proved that any ordinary lunarian may rate his chronometers by them for sea service better than by any other method: for if the plan be followed out which is shown forth in the following paper, and more fully, though rather differently, explained in a pamphlet published by Wilson, late Norie and Wilson, the most ordinary lunarian may succeed; for not only does the method destroy any constant error in the observer's eye, but also in the sextant used.

What follows is copied from the log kept for the Board of Trade during our last voyage from September, 1858 to August, 1859.

	No. 1690. *Slow of G.M.T.* m. s.	*No.* 1759. *Fast of G.M.T.* m. s.
Oct. 2nd.—The mean of four sets of ☉ E. ☾ lunars gave the following errors for the chronometers . .	2 6·0	3 25·5

	No. 1690. *Slow of G.M.T.* m. s.	No. 1759. *Fast of G.M.T.* m. s.
Oct. 2nd.—The makers errors brought on by the maker's rates were . .	1 11·5	3 24·0

Hence the ⊙ E. ☾* lunars are 54·5s. or 13¾′ W. of 1690 and 1·5s. or ¼′ E. of 1759.

Oct. 15th.—The mean of six sets of ✱ E. and W. of ☾ lunars taken during four days gave the following errors . .	5 3·6	1 48·0
The maker's errors brought on by the maker's rates were	1 27·7	4 5·2

Hence these ✱ E. and W. of ☾ lunars are 3m. 36s. or 54′ W. of 1690 and 2m. 17s. or 34¼′ W. of 1759.

Oct. 17th.—The mean of two sets of ⊙ W. ☾ lunars gave the following errors for the chronometers . .	4 41·5	2 21·6
These errors meaned with the ⊙ E. ☾ errors found Oct. 2nd, give the following errors on Oct. 10th . .	3 23·8	2 53·6
Oct. 10th.—The maker's errors brought on by the maker's rates were . .	1 21·2	3 48·7

Hence the mean of these ⊙ E. and W. ☾ lunars is 2m. 2·6s. or 30¾′ W. of 1690 and 55s. or 13¾′ W. of 1759.

Oct. 27th.—The mean of two sets of ⊙ E. ☾ lunars gave the following errors for the chronometers . .	4 5·0	4 5·6
These errors compared with the ⊙ E. ☾ errors Oct. 2nd give the following rates to the chronometers . . .	0 4·9 losing.	0 1·6 gaining.
These errors meaned with the ⊙ W. ☾ errors found Oct. 17th give the following errors on Oct. 22nd . .	4 23·3	3 13·6
Oct. 22nd.—The maker's errors and rates were	1 36·8	4 28·3
	0 1·3 losing.	0 3·3 gaining.

Hence the mean of these ⊙ E. and W. ☾ lunars is 2m. 46·5s. or 41¼′ W. of 1690, and 1m. 15s. or 18¾′ W. of 1759.

And these ⊙ E. ☾ rates differ from those supplied by the maker thus:—

1690 losing 3·6s. more daily. 1759 gaining 1·7s. less daily.

Nov. 11th.—The mean of four sets of ⊙ W. ☾ lunars gave the following errors for the chronometers . .	7 46·3	2 10·9
These errors compared with the ⊙ W. ☾ errors found Oct. 17th give the following rates to the chronometers .	0 7·4 losing.	0 0·5 losing.
These errors meaned with the ⊙ E. ☾ errors found Oct. 27th give the following errors on Nov. 4th . .	5 55·7	3 8·3

* It will be noticed that these results are deduced from ⊙ E. ☾ lunars only, so that but little confidence can be placed in them.

	No. 1690. *Slow of G.M.T.* m. s.	No. 1759. *Fast of G.M.T.* m. s.
Nov. 4th.—The maker's errors and rates were	1 53·7	5 11·2
	0 1·3 losing.	0 3·3 gaining.

Hence the mean of these ⊙ E. and W. of ☾ lunars is 4m. 2s. or 60½′ W. of 1690, and 2m. 3s. or 30¾′ W. of 1759.

And these ⊙ W. ☾ rates differ from those supplied by the maker thus:—

1690 losing 6·1s. more daily. 1759 gaining 3·8s. less daily.

Note.—In several of the above instances only two sets of lunars form a series, so that great dependance cannot be placed on their results. Still the whole prove that 1690 is losing more and 1759 gaining less than the rates supplied by the maker. Hence we must be West of the position in which his errors place us.

Dec. 1st.—The mean of six sets of ⊙ E. ☾ lunars gave the following errors for the chronometers	7 50·7	4 50·0
These errors compared with the ⊙ E. ☾ found Oct. 27th give the following rates to the chronometers . . .	0 6·4 losing.	0 1·3 gaining.
These errors meaned with the ⊙ W. ☾ errors found Nov. 11th give the following errors on Nov. 21st . .	7 48·5	3 50·5
Nov. 21st.—The maker's errors and rates were	2 15·8	6 7·3
	0 1·3 losing.	0 3·3 gaining.

Hence the mean of these ⊙ E. and W. of ☾ lunars is 5m. 32·7s. or 83¼′ W. of 1690, and 2m. 16·8s. or 34¼′ W. of 1759.

And these ⊙ E. ☾ rates differ from those supplied by the maker thus:—

1690 losing 5·1s. more daily. 1759 gaining 2·0s. less daily.

Dec. 12th.—The mean of six sets of ⊙ W. ☾ lunars gave the following errors for the chronometers	11 7·2	3 32·6
These errors compared with the ⊙ W. ☾ errors found Nov. 11th give the following rates to the chronometers .	0 6·5 losing.	0 2·7 gaining.
These errors meaned with the ⊙ E. ☾ errors found Dec. 1st give the following errors on Dec. 7th . . .	9 32·3	4 12·6
Dec. 7th.—The maker's errors and rates were	2 36·6	7 0·1
	0 1·3 losing.	0 3·3 gaining.

Hence the mean of these ⊙ E. and W. of ☾ lunars is 6m. 55·7s. or 104′ W. of 1690, and 2m. 47·5s. or 42′ W. of 1759.

And these ⊙ W. ☾ rates differ from those supplied by the maker thus:—

1690 losing 5·2s. more daily. 1759 gaining 0·6s. less daily.

Note.—These last errors and rates are deserving of great confidence because they are deduced from two series of six and one series of four sets of lunars.

	No. 1690. *Slow of G.M.T.* m. s.	No. 1759. *Fast of G.M.T.* m. s.
Dec. 15th.—The mean of six sets of ✱ E. and W. of ☾ lunars gave the following errors for the chronometers . .	11 13·6	4 9·6
These errors compared with the ✱ E. and W. of ☾ errors found Oct. 15th give the following rates to the chronometers	0 6·2 losing.	0 2·4 gaining.
Dec. 15th.—The maker's errors and rates were	2 47·0	7 26·5
	0 1·3 losing.	0 3·3 gaining.

Hence these ✱ E. and W. of ☾ lunars are 8m. 27s. or 127′ W. of 1690, and 3m. 17s. or 49¼′ W. of 1759.

And these ✱ E. and W. of ☾ rates differ from those supplied by the maker thus:—

1690 losing 4·9s. more daily. 1759 gaining 0·9s. less daily.

Dec. 26th.—The mean of five sets of ☉ E. ☾ lunars gave the following errors for the chronometers . . .	13 16·6	4 51·8
These errors compared with the ☉ E. ☾ errors found Dec. 1st give the following rates to the chronometers . .	0 12·9 losing.	0 0·1 gaining.
These errors meaned with the ☉ W. ☾ errors found Dec. 12th give the following errors on Dec. 19th . .	12 12·0	4 12·4
Dec. 19th.—The maker's errors and rates were	2 52·2	7 39·7
	0 1·3 losing.	0 3·3 gaining.

Hence the mean of these ☉ E. and W. of ☾ lunars is 9m. 20s. or 140′ W. of 1690, and 3m. 27s. or 51¾′ W. of 1759.

And these ☉ E. ☾ rates differ from those supplied by the maker thus:—

1690 losing 11·6s. more daily. 1759 gaining 3·2s. less daily.

I have no doubt this sudden change in the rates of the chronometers was caused by increased heat, the ship being near the equator. A similar change took place near the equator in the Atlantic; since which time 1759 had partially recovered its old rate, but 1690 went pretty steadily at its new rate, and now makes a further stride into the path of error. Had our chronometers been rated with reference to temperature, so much recommended by Mr. Hartnup, in Liverpool, they would have given us the longitude more correctly.

Now we are drawing near to Madras, and, as no more lunars can be obtained, it becomes requisite to decide upon the ship's position: to aid us we will examine the movements of No. 1759 during the passage, this being our best chronometer.

Oct.	10th, ⊙ E. and W. ☾ lunars made	1759*	14′	E. of truth.
„	15th, ✱ E. and W. of ☾	„	34¼†	„
„	22nd, ⊙ E. and W. of ☾	„	18¾	„
Nov.	4th, „	„	30¾	„
„	21st, „	„	34¼	„
Dec.	7th, „	„	42	„
„	15th, ✱ E. and W. of ☾	„	49¼	„
„	19th, ⊙ E. and W. of ☾	„	51¾	„

Here is abundant evidence that No. 1759 chronometer, with the maker's error applied, is about fifty miles East of truth. The same method shows that 1690 is 140 miles East of truth. Therefore we will combine the rate by the ✱ lunars of Dec. 15th with that by the ⊙ lunars of Dec. 19th, and we will allow that on Dec. 19th 1759 chronometer is 4m. 12·4s. fast, and gaining 1·4s. daily; also that 1690 is 12m. 12·0s. slow, and losing 12·9s. daily. Its last lunar rate is retained without combining it with that found on the 15th because it is known to go very badly and their second difference requires it.

Dec. 31st.—The flash of the Madras gun gives us the following errors:—

1759 4m. 32·9s. fast. 1690 14m. 56·0s. slow.

By bringing the above lunar errors up to Dec. 31st we have—

1759 4m. 29s. fast. 1690 14m. 46·7s. slow.

So that we have the correct longitude to a mile by 1759, and to 2¼ miles by 1690 chronometer.

Surely this table is a fair proof of the great value of lunars and a protest against the way in which they are now neglected. Still, young beginners cannot be too often cautioned that a single lunar is of little or no value until the observer knows the usual difference between his lunars taken on opposite sides of the moon; and these should be taken with the same instrument, using the same screens and telescope, for he must remember that they may be expected to differ. My star lunars differ from three to four minutes, or say fifty miles of longitude; my sun lunars from one to two minutes, or say twenty minutes of longitude. Knowing this, a single lunar is very valuable to me.

Many people only take lunars after they have been some weeks away from port, but nothing will give such confidence in them as taking them just after leaving port, when the true longitude is well known. This gives the observer that constant error for lunars taken on each side of the moon which is so valuable; in fact, during the early part of the voyage the chronometers give the errors of the

* Having the maker's error applied.

† These ✱ E. and W. of ☾ lunars are the only diversion in the proof that this chronometer is altering by a steady progression. Even they cautioned us in the right direction, just as we were about to sight the Rocas; and the ⊙ and ☾ lunars of five days earlier showed us that they are extreme in their caution.

lunars, which kind office the lunars return as the passage draws to a close. This remark is most applicable to sun and moon lunars, where you have to wait a fortnight before distances can be obtained on both sides of the moon.

To illustrate this we will give the sun and moon lunars taken during our short passages in the Indian seas.

	No. 1690. *Slow of G.M.T.* m. s.	No. 1759. *Fast of G.M.T.* m. s.
Feb. 25th, 1859.—The mean of two sets of ☉ E. ☾ lunars gave the following errors for the chronometers . . .	26 20·1	6 50·0
These errors compared with the ☉ E. ☾ errors found Dec. 26th give the following rates to the chronometers .	0 12·8 losing.	0 1·9 gaining.
These errors meaned with the ☉ W. ☾ errors found March 12th give the following errors on March 5th . .	29 17·4	6 26.2
Mar. 5th.—In Madras the gun flash gave these errors and rates	29 27·1	6 22·4
	0 17·3 losing.	0 1·2 gaining.

Hence the mean of these ☉ E. and W. ☾ lunars is 10s. or 2½′ E. of 1690, and 4s. or 1′ E. of 1759.

And these ☉ E. ☾ rates differ from the Madras rates thus:—

1690 losing 4·9s. less daily. 1759 gaining 0·7 more daily.

Mar. 12th.—The mean of two sets of ☉ W. ☾ lunars gave the following errors for the chronometers . .	32 2·0	6 0·3
These errors compared with the ☉ W. ☾ errors found Dec. 12th give the following rates to the chronometers .	0 13·4 losing.	0 1·6 gaining.

The meaning of these errors with those taken Feb. 25th is given above.

Hence these ☉ W. ☾ rates differ from the Madras rates thus:—

1690 losing 3·9s. less daily. 1759 gaining 0·4s. more daily.

Here we must remark that the ship was in Madras on March 5th, so that the actual errors of the chronometers were known, and the mean of the lunar errors agrees with it to one mile in the case of the best chronometer, and its last lunar rate to four-tenths of a second; but rates found in port are not of great value, because changing the cargo disturbs the chronometers very much.

The use of these lunars, taken when the ship's actual position was known, is this: we learn from them that my ☉ E. ☾ lunars give a position about 8½ miles East of truth, and the ☉ W. ☾ ones the same amount West of truth. This known makes one set of lunars valuable.

It would be of little use to give the results of my lunars during the passage home,—they are to be found in the log kept for the Board of Trade; suffice it to say that they gave a position about fifteen miles East of our best chronometer. So that, relying on

them, we steered for the Lizard Lights, and about 9h. 30m. p.m. of August 12th we found our position by altitudes of the North Star and Arcturus, which put us about twenty-eight miles from the Lizard. The look-out man was then ordered to go on the fore-topsail yard: he reported the lights immediately.

August 17th.—The chronometers were taken by Messrs. Brookbank and Atkins, who at my request watched their rates for nine days, which I give below.

	No. 1690.	No. 1759.
	s.	s.
August 18th	12·5 losing.	0·5 losing.
„ 19th	12·5 „	0·5 gaining.
„ 20th	11·5 „	1·0 „
„ 21st	10·5 „	1·5 „
„ 22nd	10·5 „	1·5 „
„ 23rd	9·8 „	1·3 „
„ 24th	9·8 „	1·3 „
„ 25th	9·8 „	1·8 „
„ 26th	9·8 „	1·8 „

Now from St. Helena to England their sea rates had been about:—

1690 13·5s. losing. 1759 2·0s. gaining.

Here it seems that 1690 had taken up a steady daily rate of 3·7s. less than its sea rate, whilst the good chronometer 1759 was inclined to return to its sea rate; showing that a chronometer is liable to be affected by the change it undergoes in being taken from a ship at sea to a maker's shop in the city of London, and *vice versâ*, which is the most important side of the argument.

I think it has now been proved that the time has not yet come for throwing to one side that great benefit conferred on navigation by the Greenwich Observatory, in bringing the lunar tables to such perfection that the longitude may be ascertained at sea by means of the angular distance between the moon and other heavenly bodies; but that this method has, side by side with chronometers, been making rapid strides in improvement, and that hand in hand they insure the certainty of the longitude even though a ship should continue three years out of sight of land. The period three years is merely mentioned because the *Nautical Almanacs* are published for that time in advance.

The importance of the following remark is my reason for giving it here, though it is not exactly connected with the above subject. On entering the English Channel the variation by azimuth compass was 23° W., but by our steering compass it was only 19° W. This difference had been observed for many days, as we took an azimuth every other morning while at sea, and every morning when near land. It shows how requisite it is to compare the direction of the ship's head by both compasses when an azimuth is taken, for any difference there may be in this, would also be in the bearing of the sun; hence the variation of the steering compass is obtained, or, to speak more cor-

rectly, the combined effect of variation and deviation is obtained when the ship is on that particular course.

When the ship's head was W.N.W. the compasses agreed, but their difference increased as it came round by North to East. Here was nearly half a point to lead us on the rocky coast of France if the wind had been scant or the weather foggy.

Since this paper was in type I sent a copy of the "Westerly Route across the Line" to the commander of a small ship; in his answer he says,—"Your remarks on lunars are exceedingly good; mine on opposite sides of the moon frequently differ to the extent you mention, still I have always found their means correct, and have trusted them, for it is a fact that I never had a good chronometer."

[We commend this paper to the special attention of our nautical readers, setting forth as it does the real value of lunars from the manner in which they should be used, by meaning their results on each side of the moon. It cannot but enhance their value, especially when the errors to which chronometers are always liable are considered. In respect of the *Nautical Almanac*, that most perfect of books, under the excellent management of its present Superintendent, Mr. Hind, it is published *four* years in advance,—that for 1863 was published a few days ago.—ED.]

ON THE GULF STREAM AND CURRENTS OF THE SEA,—*By M. F. Maury, of the National Observatory, Washington.*

The July number of this journal contains a paper from Dr. Stark, F.R.S.E., &c., on the "Temperature of the Sea around the Coasts of Scotland in 1857 and 1858."

He proposes to give the discussion of this interesting subject a wide range, which shall embrace the theory of the Gulf Stream and the influence of that and other currents of the North Atlantic upon Scottish climates. The accompanying letter, written a few weeks ago, is somewhat germain to the subject, and as it may be of service now, I inclose it herewith. I do this the more readily because it affords me an opportunity to say here in a very few words what with a great many I have endeavoured to make clear elsewhere, and that is,—that the Gulf Stream and all the *constant* currents of the sea are due *mainly* to differences in the specific gravity of sea water. Whether these differences arise from changes of temperature or changes in saltness—either or both—they disturb equilibrium in the sea; consequently, there is immediately an effort made by nature, and manifested in the shape of currents, to restore that equilibrium. But the *chief* disturbing causes are heat and cold, rain and vapour. They are per-

petual in their action; consequently, nature is as ceaseless in her efforts to do what they are constantly undoing. Hence the *constant* currents in the ocean, such as the Gulf Stream, &c.

As a rule, the waters of the Gulf Stream when, at a temperature of 80°, they set off to run their course are lighter than the waters through which they are yet to flow for many days. But though lighter they are salter—(while at 80° there is a difference in temperature of about 50° between them and the waters of the frozen ocean). Now, when these warm waters lose, by flowing North, a certain quantity of heat, they become, in consequence of their greater saltness, heavier than the polar waters which have been diluted with the rivers and the rains that are poured down upon and into the Arctic Ocean.—(*Vide* chapter "Specific Gravity of the Sea," p. 235, vol. i., 8th edit., *Maury's Sailing Directions.)*

As this equatorial water gets nearer to the pole it grows cooler still, though not so cool as the water it meets from the pole; yet, in consequence of its salts, it becomes specifically heavier than the opposite current of cooler water. Finally, when the difference of specific gravity and the depth of the channel way become sufficient, as in Davis Straits, it sinks, and goes into the Arctic Ocean as heavy water, though it set off from the equator as *light.*

This may appear paradoxical, but a little reflection will make it clear.

The water about the North pole is not so salt as the equatorial waters are, but it is heavier because it is so much colder, the mean difference of temperature between equatorial and polar waters being about 50°. With this difference the two waters set off to exchange places. As the polar water flows South it gets warmer and therefore lighter, but as it approaches the trade wind region it reaches climates where evaporation becomes in excess of precipitation. Here it begins to part with vapour, whereby its saltness is increased. So that from the parallel of about 35° to the equator the increase of saltness and the increase of temperature are so nearly equal in their effects—one increasing the other lessening specific gravity—that the two may be almost said to counterbalance each other, and in this way:—As the water from the polar regions approaches the equator from that parallel it grows warm, and would grow lighter but for evaporation. This, by taking away fresh water, leaves the rest more briny, and, consequently heavier; but the rate of this briny increase, as compared with the thermal increase, is such that the specific gravity remains nearly the same. Thus observations abundantly show (Plate xvii., vol. i., *Maury's Sailing Directions)* that the specific gravity of sea water measured parallel by parallel from 34° to the equator alters but little, though its temperature may have changed as much as 20° or 25°.

The less briny but colder and heavier water from the poles grows warm as it flows South, and consequently grows specifically *lighter.* The salter, but warmer and lighter, water from the equator grows colder as it flows North, and consequently grows specifically *heavier.*

So that there must be a place somewhere between the poles and the equator where the two waters reach the same specific gravity. If one be cooler the other is salter, yet the difference in the quantity of salts is such as to make their specific gravity the same, notwithstanding the difference of temperature.

Now, the question may be asked, why, since at or near a certain parallel the specific gravity both of the warm and the cool current is the same, do not the polar waters stop, turn back, and flow North again into the Arctic Ocean,—those from the equator returning South? The answer is, the machine is at work; the waters are already in motion; they have acquired momentum, and to keep them moving onwards there is a *vis a tergo*—the pressure of the current from behind—which, like the fly-wheel in machinery, is sufficient to overcome the "*dead point*," and to carry beyond. So, having passed this dead point, or place of like specific gravity, the equatorial waters then become the heavier; they enter the Arctic Ocean to be diluted by the rains, the frost, and the immense volumes of fresh water which flow into that sea from the great water shed of the North. Being thus diluted as to brine, they become lighter once more, and are now ready to commence to flow South in their ceaseless round.

In the North Pacific Ocean there is a turning back, and for the reason that the straits which connect that sea with the Arctic Ocean have not capacity sufficient to pass the waters of a Gulf Stream. These waters flow north-eastwardly along the offings of the Japan coast. Reaching the parallels of Kamtschatka and the Aleutian Islands, they have there their temperature so reduced as to make them specifically heavier than they were when they left the tropics. In the North Pacific the mean specific gravity of the water between the equator and 25° N. is ·001 less than it is between the parallels of 45° and 55° (*Vide* fig. 1, plate xvii., vol. i. *Maury's Sailing Directions.*) In other words, a thousand gallons of sea water between the last named parallels are as heavy as a thousand and one between the first named. This difference of "one in a thousand" is the chief source whence the North Pacific Ocean derives dynamical power for its system of circulation, which is much more feeble than that of the North Atlantic.

Reaching the parallels of 45°—55°, a small portion of this heavy water finds its way through Behring Strait into the Arctic Ocean; and there it has been discovered below the surface as a layer of "hot and heavy" water, which, by the agitation of the waves, is to be brought to the surface, mixed with the fresh water from the clouds and from the great northern rivers of Europe, Asia, and America. Being thus diluted as to brine and made lighter, it is conveyed around the arctic basin to where it can find, as in the Atlantic, a less obstructed egress than Behring Straits afford.

The water which cannot find entrance into the Arctic Ocean through these straits is, after reaching its maximum specific gravity, obstructed in its further progress North by the land. But being pressed upon

by the *vis a tergo* of the current, it is deflected, and so returns to the equatorial regions, receiving as it goes the river waters of America to dilute the brine and decrease specific gravity further than mere change of temperature will allow it. In the same way a portion of Gulf Stream water *may*, without entering the Arctic Ocean, be deflected equatorially along the West coast of Spain and Africa down to the tropics again.

With this explanation, briefly stated, of my views of the *main* source of that dynamical power which maintains the circulation of the ocean in regular channels, the general reader will, after perusing the article "Physical Geography," by Sir John Herschell, in the new edition of the *Encyclopædia Britannica*, be enabled more clearly to understand the arguments adduced in the accompanying letter to show that the trade winds, so far from being the "*sole cause*" of the Gulf Stream, have, in fact, *little or no influence* upon *that* current or any *other* of the *great and constantly* flowing currents of the sea.

Observatory, Washington, 10th June, 1859.

My dear Sir John,—I thank you heartily for the instructive article "Physical Geography" (J. F. W. H.), from the new edition of the *Encyclopædia Britannica*, which was received in the sheets a few days ago.

I was quite surprised to find myself, as I do by that article, differing so widely with regard both to winds and currents from one of the fathers.

I send you in the sheets a new chapter (chapter xx.) from the new edition of the *Physical Geography of the Sea*, chiefly on account of its bearings on the air crossing at the calm belt of Capricorn.

I have sent to your address in London a copy of the 8th edition *Maury's Sailing Directions*, which I beg you will do me the favour to accept as a mark of friendly consideration. Allow me to ask you to read the chapter on the specific gravity of the sea (vol. i.), on account of its bearings upon remarks in your article "Physical Geography."

You (57) make the trade winds the "*sole cause*" of the Gulf Stream, and ignore almost if not entirely (59) the dynamical force arising from difference of specific gravity in sea water. On the contrary, I make difference of specific gravity arising from change of temperature and variations as to degree of saltness to be the main source whence that dynamical power is derived which imparts to the waters of the ocean their *general* system of circulation.

Pages 248 and 251, vol. i., *Sailing Directions* show approximately changes in sea water both for dilatation and specific gravity, according to the thermal law. There is some difference in this law as applied to fresh and to salt water. Perhaps on reviewing this difference (in connection with your 57, &c.) and after inspecting plates xvii. and xviii.,

vol. i., *Sailing Directions*, you will perceive how a "lateral impulse" may be given to the waters of the ocean in consequence of change of specific gravity. If so, perhaps you will then assist me to vindicate for salt and heat their supremacy in giving to the sea not its *sporadic* currents—which are caused mainly by the winds—but its system of general circulation.

Chapter xx. *Physical Geography of the Sea*, (1859,) shows how very much stronger are the S.E. than the N.E. trade winds of the Atlantic Ocean. Each system in its band blows nearly perpendicularly upon the shore lines of South and Central America. If the trade winds be the "*sole cause*" of the Gulf Stream, should we not look for another such stream along the coast of Brazil, in a prolongation of the famous St. Roque current, so called? I send you a thermal chart of the South Atlantic. You will see by the temperatures there recorded that the flow of warm water to the South along the coast of Brazil is so feeble—judging by the difference of temperature—as scarcely to deserve the name of current.

In the Atlantic Ocean between the parallels 25° N. and 25° S. there have been discussed, as per the Pilot Chart, 188,969 observations for the winds. Each one of these observations embraces a period of eight hours; thus giving us in the trade wind region of the Atlantic Ocean, observations on the prevailing direction of the wind three times a day for 62,989⅔ days in the aggregate. Of these observations, 106,962 were in North latitude, and 82,007 in South. They are arranged in parallel bands, each band being 5° of latitude broad, counting each way from the equator.

Number of Observations.

Between	0°	and	5°	21,667	for North Atlantic.	15,464	for South Atlantic.	
„	5		10	22,777	„ „	13,715	„ „	
„	10		15	16,950	„ „	14,421	„ „	
„	15		20	19,954	„ „	17,844	„ „	
„	20		25	24,614	„ „	20,563	„ „	

Grouping these winds by quadrants, and including as in the N.E. or 1st quadrant all the winds entered on the Pilot Charts from North to E.N.E., inclusive, we obtain the mean direction of the wind for the trade wind quarter (N.E.) in the North, and in like manner for the trade wind quarter (S.E.), 2nd quadrant, in the South Atlantic. We may also determine from such a mass of observations the average number of days in the year during which the wind blows "trade" on each side of the equator. Accordingly I present you such a statement:—

Between Latitudes	*N.E. Trades.*		*S.E. Trades.*	
	Mean Direction.	Annual Duration.	Mean Direction.	Annual Duration.
0° and 5°	N. 48° E.	76 days.	E. 34° S.	308 days.
5 10	N. 46 E.	118 „	E. 41 S.	329 „
10 15	N. 47 E.	208 „	E. 37 S.	305 „
15 20	N. 46 E.	197 „	E. 34 S.	253 „
20 25	N. 43 E.	167 „	E. 34 S.	163 „
Means	N. 46 E.	153 days.	E. 36 S.	272 days.

It thus appears that between the equator and the parallels of 25° North and South in the Atlantic Ocean the mean direction of the N.E. trade wind is N. 46° E., with an average duration of 153 days during the year; and that the mean direction and average annual duration of the S.E. trade wind is E. 36° S. for 272 days.

If we deduct from the N.E. trade wind the south-westerly winds that blow between 0° and 25° N., and from the S.E. trades the north-westerly winds that blow between 0° and 25° S., we shall have left the effective hygro-dynamical force in days of the N.E. trade winds on this side, and of the S.E. trade winds on the other side of the equator. We thus have 111 (153—42) effective days of current begetting N.E. trade winds, and 268 (272—4) of S.E.

The following statement shows the mean direction and average annual duration of the S.W. winds between the equator and 25° N., and of N.W. winds between the equator and 25° S.

Between Latitudes	*S.W. Winds.*		*N.W. Winds.*	
	Mean Direction.	Annual Duration.	Mean Direction.	Annual Duration.
0° and 5°	W. 75° S.	73 days.	N. 67° W.	4 days.
5 10	W. 62 S.	94 „	N. 73 W.	1 „
10 15	W. 55 S.	26 „	N. 55 W.	2 „
15 20	W. 63 S.	11 „	N. 52 W.	5 „
20 25	W. 61 S.	28 „	N. 48 W.	9 „
Means	W. 63 S.	42 days.	N. 59 W.	4 days.

These 42 days of S.W. winds between the equator and 25° N. blow eastward or counter to the N.E. trades. It may be supposed that these winds carry in these 42 days as much water to the eastward as the N.E. trade winds blow to the westward in 42 days. In other words, the 42 days of S.W. winds cancel the current begetting power

of the N.E. trade winds for 42 days. Hence, as I observed, if we admit the trade winds to be the "*sole cause*" of the Gulf Stream, we have to admit that the N.E. trade winds perform their part in its genesis in less than one-third of the year (111 days). The Gulf Stream is a constant current, and if it were caused by these winds would it not follow them in their fluctuations?

I have statistics (p. 57 *et seq.*, vol. 2, *Sailing Directions,*) to show that the hydro-dynamical power of the N.E. trade winds is feeble. Their force is only sufficient to give a fair sailer an average speed of about six knots an hour; whereas the S.E. trade winds have strength enough to give her an average speed of eight knots. Hence you perceive that the trade wind power of the North stands to the trade wind power of the South Atlantic in the ratio of about 36 to 64.—(See chapter xx. *Physical Geography of the Sea*, 1859.) I respectfully submit that the feeble N.E. trades with their current giving power in full play only for 111 out of the 365 days in the year on the average, cannot rightfully be considered as the "sole cause" of the Gulf Stream, or even as a very efficient *primum mobile* of its waters.

The Gulf Stream, let it be remembered, comes out of the Gulf of Mexico between the trade wind parallels of 20° and 25° N. The winds between these parallels tend to blow the stream back into the gulf; therefore in reckoning the trade wind force which on this side of the line you would call in to give momentum to the Gulf Stream, we should deduct, not add, the winds between those parallels. If we were to do this, it would give us an effective current begetting force for the winds in the N.E. trade wind region (from 25° N. to the line) annually of 73 days between the parallels 15° and 20°; of 151 between 10° and 15°; of 92 between 5° and 10°; and of 171 between the equator and 5° N.

Did it never occur to you that none of the constant or regular currents of the sea set with the wind?

The Gulf Stream, the Japan Current, the Arctic Currents, the Mozambique Current, and Humboldt's Current are all athwart or against the direction of the wind,—not one of them is with it.

You tell us how DeHaven and the *Resolute* each drifted 1,000 miles with the ice upon the Arctic Current; but meteorological observations do not show where the winds are that caused this drift from the poles towards the equator—the cold towards the place of the warm water.

In the article "Physical Geography" (*Encyclopædia Britannica*), the particles of water before the wind are likened to a billiard ball when struck by the cue; they roll along on the surface of the sea as it does on the table. To prove that these are the particles which the Gulf Stream carries out of the Gulf of Mexico we must show, since neither the Gulf Stream itself nor the currents which feed it set with the trade winds,—that these particles when they impinge upon the shore would be deflected in the direction of these currents.

I have had drawn on the accompanying map wind vanes in the trade wind region for every 5° of latitude to show the mean direction and average annual duration in days of the wind from the trade wind

quarter, both N.E. and S.E. The numbers show the average *net* time in days that these winds blow annually. (That is, the excess of N.E. over S.W. winds, and of S.E. over N.W. winds.)

If, in the case of these aqueous little billiard balls, to which you liken the particles of water driven before the trade winds, we require, as in the ivory ones the billiard player does, the angle of incidence and reflection to be equal to each other, we shall be very far from assigning a direction to the reflowing particles of water which will bring them within the channel of the Gulf Stream.

It may be urged that this is a partial view; that between the equator and 25° N. the wind frequently has easting in it, without any northing, and that on the other side of the line it has easting in it very often without any southing; that it is these easterly winds, both N.E. and S.E. on each side of the line, which create the Gulf Stream.

Let us follow this view.

Classifying the winds on the Pilot Charts as winds with easting and winds with westing, and arranging them in groups on opposite sides of the equator, we have the following tabular statement:—

The average number of calms amount to 18 days in the N.E. and 4 days in the S.E. trade wind region. Deducting the days of winds with westing from those with easting in them, we have an excess of easterly winds for 194 days in the N.E., and of 289 in the S.E. trade wind region. The arrows on the chart represent the average annual duration of the winds for each band of 5°, and they show how the *little billiard balls* should impinge upon the coast. The numbers along the arrows show the excess, in days, of winds with easting over those with westing in them.

Winds with Easting and Winds with Westing in them in the Trade Wind Regions.

N.E. Trade Region.

Between Latitudes	*Easting.*		*Westing.*	
	Mean Direction	Annual Duration.	Mean Direction.	Annual Duration.
° °	°		°	
0 and 5	E. 17 S.	254 days.	W. 62 S.	83 days.
5 10	E. 11 N.	212 „	W. 51 S.	120 „
10 15	E. 24 N.	202 „	W. 15 S.	45 „
15 20	E. 21 N.	333 „	W. 11 S.	21 „
20 25	E. 19 N.	289 „	W. 17 S.	50 „
Means	E. 12 N.	258 days.	W. 31 S.	64 days.

Excess, in days, of winds with easting 194 = (258—64).

S.E. Trade Region.

Between Latitudes	*Easting.*		*Westing.*	
	Mean Direction.	Annual Duration.	Mean Direction.	Annual Duration.
° 0 and ° 5	° E. 29 S.	329 days.	° W. 60 S.	32 days.
5 10	E. 37 S.	343 „	W. 67 S.	21 „
10 15	E. 28 S.	246 „	W. 45 S.	17 „
15 20	E. 15 S.	327 „	W. 47 S.	32 „
20 25	E. 4 N.	281 „	W. 21 S.	76 „
Means	E. 21 S.	325 days.	W. 52 S.	36 days.

From St. Roque to 25° S. the trend of the coast is S. 22° W. The water therefore would, according to the trade wind theory, be drawn so nearly at right angles upon this part of the coast that it would be deflected in a current neither to the North nor the South.

To satisfy oneself how inadequate are the trade winds to beget the Gulf Stream or any such current, a mere glance at the map and these arrows ought, it seems to me, to suffice.

But other and independent facts equally as conclusive may be adduced:—The S.E. trade winds blow with nearly twice the force of the N.E., and yet there is no "majestic flow of waters" in the South Atlantic. Nay, the Mozambique Current—that other Gulf Stream along the eastern coast of Africa—gives testimony which is conclusive on the subject. It, like our Gulf Stream, is a constant current. It comes out of the Arabian Sea, takes nearly a S.S.W. course thence, and runs, against the S.E. trades, along the coast of Africa towards the Cape of Good Hope. For half the year in the Arabian Sea the S.W. monsoons prevail. Now, if the trade winds have anything to do with this current it ought certainly to cease during the season of the S.W. monsoons, for these winds would blow the water directly from the coast of Africa over to the N.E., towards India; and the water blown before the S.E. trade winds would, striking against the African shore lines, be also deflected to the N.E.

Facts enable me to go still further and show how that even the "brave" West winds of the extra-tropical coast, which blow with an average force nearly double that of the S.E., and nearly quadruple that of the N.E. trades, have not the power to create any movement in the waters of that ocean deserving the name of currents. They make a drift which amounts to five or six miles a day.—(See the "Drift of the Sea," plate xiv., vol. i., *Sailing Directions.)* But the currents, as shown by the icebergs, run across the line of this drift.

Allow me to present the statistics afforded by the Pilot Charts with regard to the winds between the parallels of 40° and 60° S. These

charts give us in bands 5° broad an aggregate of 119,788 observations upon the prevailing direction of these winds between these parallels. Grouping those with easting together on one hand, and those with westing on the other, we obtain the mean direction and annual average duration of these winds as follows:—

Between Latitudes	*Winds with Easting.*		*Winds with Westing*		Total Number of Observations.
	Mean Direction.	Annual Duration.	Mean Direction.	Annual Duration.	
40 and 45	N. 56° E.	93 days.	N. 93° W.	264 days.	63,668
45 50	N. 56 E.	95 ,,	N. 90 W.	261 ,,	29,122
50 55	N. 64 E.	85 ,,	N. 92 W.	273 ,,	14,336
55 60	N. 60 E.	80 ,,	N. 82 W.	276 ,,	12,632
	N. 59 E.	88 days.	N. 89 W.	268 days.	119,788

Excess, in days, of winds with westing in them 180 = (268—88).

These westerly winds always blow with the force of a gale; yet we search the annals of navigation in vain for any constant current running from West to East on the polar side of 40° S.

I have a bottle paper which was thrown over in this part of the ocean, lat. 42° 40′ S., long. 42° 32′ W., by Captain Tobin, of the English ship *Ocean Chief*, on the 1st day of January, 1857, and was picked up at sea, December 16th of the same year, by Captain Williams, of the American ship *Gideon Howland*, in lat. 39° 50′ S., long. 36° 35′ E.—(p. 607, vol. ii., *Sailing Directions.)*

This bottle drifted before the wind at the rate of about ten miles a day. Part of it was above water, and therefore exposed to the winds; consequently it was driven faster than the water of the ocean was before these winds. The icebergs from the Antarctic regions that are frequently found to the North of the track of this bottle show how the currents flow in that part of the sea. They flow from the South towards the North, in obedience to thermal laws and the laws of equilibrium, and not from the West towards the East in obedience to the power of the winds. In violent storms the wind does pile up water in great heaps and gives rise to sweeping currents; but these are born in the storm, they march with it, and when it is done they sink to rest. They are the sporadic currents to which I have alluded, and to make these currents felt strong winds are necessary.

There are currents, upper and under, setting in and out of the Arctic Ocean; in and out of the Mediterranean, the Red Sea, and the Baltic. These currents, we know, are not caused by the winds,—they are constant currents, and are kept in motion not by the fickle winds but by the ceaseless effort of nature to resist that aqueous

equilibrium which her agents, heat and cold, sea salts, and the processes of evaporation, are as ceaselessly destroying.

I owe you an apology for so long a letter. Perhaps the cause of truth which we both seek to advance would have been better subserved, and the real relation between the winds and the currents of the sea vindicated, by simply pointing you to the warm waters of the Gulf Stream which lave the shores of your own happy islands.

While this body of warm water is setting along the eastern side of the North Sea into the Arctic Ocean, there is on the western side of the same sea the famous Greenland Current—a cold and ice bearing current that runs exactly in the opposite direction to the warm. Or I might have simply asked you to account, according to your trade wind theory, for the Mozambique Current when the S.W. monsoons are sweeping across the Arabian Sea.

Or I might have asked you to explain the fact why the "Gulf Stream" of Japan is not much larger and more rapid than ours. The trade winds have a much freer sweep across the North Pacific than they have across the North Atlantic Ocean, for the breadth of the former is double that of the latter. And if the trade winds be the "sole cause" of the Gulf Stream in the North Atlantic, why should they not create in the North Pacific—which is a much larger sea—a larger Gulf Stream?

The true answer to this question is to be sought for in the fact that the Atlantic ocean communicates through wide and deep channels with the Arctic Ocean, through which an interchange of *warm* and *cold*, of *light* and *heavy* waters can take place; whereas, between the North Pacific and Arctic Oceans such channels are lacking.*

It is incumbent, I submit, upon the advocates of the trade wind theory to reconcile these phenomena, or to abandon the trade winds as the *sole cause* of the Gulf Stream, &c., and look to other agents for the source of that dynamical power which gives to the ocean its system of circulation, to the sea its regular currents, and to the Gulf Stream its majesty and grandeur.

Very truly yours,

M. J. MAURY.

Sir J. F. W. Herschell,
Collingwood, Kent, England.

* Did the Pacific Ocean communicate with the Arctic through straits and channels as wide and as deep as those that lie between the North Atlantic and the Frozen Ocean, it would not be difficult to show how the volume of *our* Gulf Stream would be dimished, while that of the Pacific, known as the Japanese Current, would be correspondingly increased.

The French in Madagascar.—1642 *to* 1672.

(Continued from page 474.)

But this was far from being the last mishap to be suffered by the colony. After this disaster, and while Perriers was gone to the Mahafalas and the Machicores to fulfil some of the promises made to Flacourt, the *St. George*, which had sailed for the R. Sea, was obliged to stop at the Isle St. Mary to careen; and while this was going on her commander, La Forest, went up the river Mananatrzan to make the natives search for diamonds. To this they very naturally objected, urging that the rice harvest was at hand and if not attended to they would perish from famine. But La Forest would not listen to this and was for compelling them to obey him, so to avoid his threats they took to flight; on which, as he was following them, he fell into an ambush, where one of the sailors who accompanied him was killed, and he, being wounded by one of their spears, fired a pistol at the native who threw it, but as the man did not fall, the rest, considering that a pistol being less than a musket could not have so much effect, attacked him fearlessly and killed him with their knives. Nearly all his party were thus massacred, for three of them only regained their boat and communicated to their companions the death of their chief. The *St. George*, however, made her voyage to the Red Sea, and on her return the pilot, Ebahi, who had conducted the voyage in the place of the captain, with part of the seamen joined some of the Galemboule natives, who had always been favourable to the Europeans, attacked the village, the people of which had massacred the party of the ship, burnt it, and carried off their cattle. From thence he sailed for Ile Bourbon, from whence he removed a large quantity of rice destined by Flacourt for his countrymen, whom he had intended to form a colony there. This, deposited with the most humble intentions, was destined for a happier purpose than intended, and was of great service to the unfortunate colonists. L'Ebahi, on his return to Fort Dauphin, found that Pronis had died eight days after the departure of the *St. George*, mortified at seeing his establishment a prey to fire; and he found Perriers in his place, who had returned just before he died in time to receive the charge of the colony.

Considering it incumbent on him to distinguish his accession to power, he committed an act of barbarity which places him in a far worse light than either of his predecessors. Less scrupulous than they were, Perriers determined that his first proceeding should be to revenge the death of La Forest, and he accused the chiefs of Carcanossi of having instigated the deed by offering rewards to the natives of Mananzatran. They denied the charge and gave up even their children in guarantee of their innocence. But this did not satisfy Perriers, who required that a certain number of them should give themselves up as hostages,—to which they consented. Some of

these he put to death and the rest he left in irons. As to the children, they were sent on board the *St. George*, but L'Ebahi, not knowing what to do with them, sent them back to Perriers, who, as they landed, speared seven of them. One of the unhappy little mortals plunging from the boat to swim on shore, although his hands were tied behind him, was not permitted to escape. A boat was sent after him, and he too suffered the fate of the rest; and finally the natives who had voluntarily given themselves up were slaughtered, notwithstanding their protestations of innocence and their imploring words to Perriers.

Can it occasion surprise that after this the colony languished when expending its strength in vain revenge after its own internal dissensions. The departure of Flacourt, the burning of the fort, the death of Pronis, and all their violent proceedings, it is true were nothing in comparison with the cruelty of Perriers. All these proceedings would operate seriously against getting any access to the inexhaustible treasures which Madagascar contains, but, as we have already said, there were more than these. Flacourt revealed them on his return to the directors of the company. He described to its directors in lively colours the abandoned condition in which he had left the settlement in those hands which had succeeded him, the want of resources in which it was lingering on, as well as the discord which prevailed among the settlers. On which Legentil observes,—"What is most extraordinary on reading what this sensible and judicious person says appears to me to be that the India Company of my day committed the same mistakes which M. Flacourt condemned a century ago." A work published about the same time attributes the misfortunes of the colony to three distinct causes, viz.,—"the want of a frequent communication with France; the bad conduct of the officers entrusted with its control; and the absence of ecclesiastics to control the disorderly proceedings of the colonists."

It has been stated that in 1652 the East India Company had obtained an extension of their grant for fifteen years, and it has been shown how Flacourt considered himself authorised to return to France. He was blamed, however, for having returned without orders, and for having left the colony in the hands of the agents of the Duke de la Meilleraie. This nobleman, nevertheless, had made an agreement with the company; which agreement, however, had not been approved by all the members, and some had protested against it,—on which account process by law was adopted. The Government still sent out their ships, the Marèchal consulting with Flacourt on the subject, who gave him every information, as the following dedication of his book will testify, addressed to the Duke, with a chart of Madagascar:—

"Sire,—I should be the most ungrateful of human beings if, after having being relieved by your orders in a clime so remote from France, I did not offer you the plan of the country where I was left to the mercy of a multitude of barbarians by those from whom I had most right to look for that relief. Let me assure you then, Sire, that in dedi-

cating this chart to you I devote at the same time the life which your generous care has preserved to me, and that I shall proclaim everywhere the special obligation with which I shall ever remain, Sire, the most humble, most obedient, and most faithful servant of your Highness, Etienne De Flacourt."

Since many of the shareholders had died, and most of those who were living had much neglected the company's affairs, by a royal decree of the 12th of October, 1656, a renewal of the grant of 1652 was made for fifteen years to Charles de la Porte, Duke de la Meilleraie, Marshal of France, and formerly Minister of Finance. This nobleman soon organized a new expedition. Gilas de la Roche, the Sieur de St. André, in 1651 had made an excellent voyage in a ship which he commanded, called *La Duchesse*, and he was selected to command an expedition to Madagascar, consisting, besides *La Duchesse*, of the *Marechale*, the *Armand*, and a little vessel *en flute*, conveying colonists and provisions of all kinds, with M. de Champmargou, the new Governor of the colony. Flacourt himself had directed the preparations of this expedition, as well as the arming of another ship entrusted to the command of M. de Goascaer, which was wrecked and went to pieces on the rocks off the coast, on which she was driven by a severe storm as soon as she had left the port. This vessel had been fitted out to destroy two ships which had been prepared with the last resources of the old company. This object was therefore entrusted to Flacourt in *La Vierge*, which sailed, having first to touch at an English port. She was afterwards attacked on her voyage about 100 leagues from Lisbon by a corsair. She foundered and Flacourt perished in her, but about a hundred of her crew were carried off slaves to Algiers.

The Duke was connected by this double proceeding with Fouquet, then Superintendent of Finance; but this alliance was of short duration, and while the Duke was sending ships to Madagascar, Fouquet on his own account sent off the *Aigle*, commanded by Hugo, a Dutch Captain, to whom he gave directions to take possession of the fort, which was then in the hands of the Marshal's agents. But her misfortunes prevented her from securing the results of this expedition.

Champmargou, who shared the command with Rivau, repelled the proposals of Hugo, and succeeded in baffling his design of winning over the little garrison. The vessel returned to France with a cargo of hides, indigo, ebony wood, aloes, benjoin, gums, precious stones, minerals, ambergris, and other valuables, which deterred the Marshal more than before from the desire of yielding his rights. He soon fitted out the *St. George* at Paimbœuf, entrusting her to the command of M. de Kerkadion, and sent by her personal presents to Champmargou. This was the last vessel which he sent out before his death in 1664 after being of great service to the colony.

Champmargou was no longer able to collect the tax, but with these new resources he detached parties to different parts of the island. Thirty men were sent to St. Augustine Bay, eighty leagues off, and forty more in another direction among the Matatanes, sixty leagues

to the northward. La Caze, the hero of Madagascar, who appears now for the first time, was directed to conduct a reconnoitring expedition to a considerable distance, and everything at Fort Dauphin went on swimmingly.

La Vacher de la Caze was from Rochelle, which he had left in 1656, in one of the ships which the Duke de Meilleraie had entrusted to the command of La Roche. The colony was then in peace, but the adventurous spirit of La Caze urged him to join in the wars which the natives were carrying on. Dian Raissatte, one of the Amboule chiefs, was at war with Dian Dalax and Dian Ramael, Princes of Mandrerei. These were in the Amboule valley with 1500 men to burn the village of Raissatte, defended by La Caze. This intrepid adventurer marched against Ramael, and at the commencement of a battle shot him and routed his army. But Dian Dalax with his men marched to encounter him. La Caze received him and engaged him in single combat and was wounded in the arm, but he also wounded Dian Dalax and made him prisoner. He gave him his liberty, however, on condition that he paid an annual tribute to Fort Dauphin. Subsequent to this, the French having gone to the Ampatres to give assistance to Dian Bel and Dian Raval against Dian Tsiandrin, had suffered reverses. There, as everywhere else, La Caze was successful. He took those princes prisoners, and Champmargou caused them to be executed. In an affair with the natives he captured a young native, whom he sent to France, where La Meilleraie attached him to his establishment as page, under the name of Panola. He married, and in 1684 was an infantry officer of the garrison of Isle St. Marguerite.

La Caze was feared in the whole of the southern part of Madagascar, and surnamed Dian Pousse after a former native conqueror. His bravery excited the jealousy and dislike of Champmargou. He was coldly received after his exploits and purposely neglected by the governor. He affected to have nothing more for him to do, and treated him merely as a volunteer, making him do the duty of a sentinel at the gates of the fort, notwithstanding his knowledge of the country and the customs of its people, while he entrusted the most inexperienced persons with conducting important expeditions. La Caze at length, vexed with such treatment, made up his mind to abandon the fort, and left it with five of his countrymen and three hundred natives. Notwithstanding the pursuit of Champmargou, he reached the establishment of Rasissatte, on the Mandrerei, who was then at war with Dian Pan, the King of the western part of the island, and who had experienced nothing but defeat. La Caze entered the Machicores country, taking the field against Dian Pan, and soon changed the tide of fortune. In spite of his position with Champmargou, he compelled Dian Pan to send 100 ounces of gold, 200 head of cattle, and 300 baskets of roots to Fort Dauphin. Dian Raissatte, for the sake of keeping so noble an ally, gave him his daughter Dian Nong. He died soon afterwards, leaving her the sovereignty of Amboule, with the support of her husband La Caze;

who, seeing Rivau, who was his friend, depart for France, leaving all authority to Champmargou, was not sorry to find himself far from the colony living independently and with the authority of a sovereign.

This did not last long, for some serious misfortunes were about to befal the colony. Captain Lavigne, of the *St. Louis*, in passing St. Augustine Bay had landed with ten men in the country of the Sakalaves, and their chief, Lahefouti, had enticed him to his village, where he was no sooner with his party than they were all assassinated, and the natives afterwards proceeded in their canoes to attack the ship, which only escaped by making sail. La Forge was then sent to the North of the St. Augustine River with 40 French and 2,000 natives of Dian Mananghe to revenge this affair. But as he was concealed in a cane field with the view of surprising Lahefouti he was himself surprised. The Sakalaves set fire to the canes in all directions, and he was destroyed with all his people. Then, again, Lavatanghe, the brother-in-law of Dian Mananghe, with Dian Dulax and Dian Pan, refused to pay any more tribute; and on endeavouring to make some terms with the former, he impudently replied that he did not treat with exiles and robbers, and as the French had a king he should only treat with him. Mananghe had already committed some acts of hostility against his brother-in-law without any result, and in the midst of these unfortunate events M. de Kerkadion arrived with a tolerable reinforcement of men and the title of governor for Champmargou, which had been obtained for him by Rivau. He interfered in the quarrel between him and La Caze, who, wrongly or rightly, believed that he would have him assassinated, and was therefore ready for a reconciliation; but Champmargou sent him word that he might come back to the fort. After this Dian Mananghe and La Caze acted in concert, submitting to the tax with Dulax and Dian Pan. They also sent a force against Lavantaghe and defeated him, and in all probability were the original cause of the general movement of the Sakalaves to the northward, from which movement commenced their grandeur. A considerable amount of booty was gained by this expedition.

Dian Mananghe, says le Pere Etienne, Prince of Mandrerei, one of the first chiefs of the island and perhaps one of the most magnanimous, was the only one of all its allies who among all the reverses of the colony remained faithful to its cause; but the religious fanaticism of the missionaries, too well seconded by Champmargou, forfeited him. He worshipped his fetiche, but yielding to the continual solicitations of the Pere Etienne, who persecuted him with them whenever he came to the fort, he had consented to have his son baptized. Not satisfied with this, Etienne often went to preach to Dian Mananghe at his residence. He had gone to him thus one day with some Frenchmen, and, encouraged by his manner during the exhortation, he embraced him and snatched away the talisman which he wore round his neck, The Malagache prince bore the indignity unmoved; but on the next morning, the moment the missionary set out for the fort, he was massacred with all his followers. This imprudent zeal

of the Pere Etienne, of which he himself was the first victim, involved the French in a serious war. The governor advanced with twenty Frenchmen and two hundred natives against the principal village, and arrived there in two days, after setting fire to everything on his road. The village stood on a small hill, like all the native villages, and was surrounded by a palissade, being on the borders of the Mandrerei country. It had cost him a good many men to gain it, but Mananghe abandoned it and, leaving it to his enemies, surrounded it with 6,000 men. Champmargou had but little provision and comparatively few men, but he sent word to La Caze of his difficult position, begging of him to send assistance. La Caze returned from his expedition against Lahefouti, left 5,000 slaves which he had captured and 15,000 cattle under the care of a sufficient force, and availed himself of his influence in the island to gain over the inhabitants of Manamboule and the Andrafares, enemies of Dian Mananghe.

During this time he had only slight skirmishes, but Dian Mananghe appeared every day on the opposite bank of the Mandrerei, dressed in the gown and hood of Etienne, mocking the French and making contortions and grimaces until the whistling of musket balls obliged him to get behind the rocks for safety. Every day also he attempted to burn the village, throwing arrows into it steeped in some inflammable composition; but the wary French defeated his attempts, although he kept them in the village. Tired at length with his fruitless attempts, and believing that the French were abundantly provisioned, and being himself badly off for them, he decided on retiring; but, at the same time, satisfied that the French would never leave it without setting it on fire, in taking off his men he gave them as a signal for t'ieir return to their stations the flames which they would leave behind them.

Meanwhile Champmargou was waiting in vain for La Caze; and, his provisions failing him, in his turn he determined to retreat by the course of the Mandrerei, and learning the tactics of Dian Mananghe from a prisoner, he set fire to the village by means of a match which would last four hours, so that he would have time to get away, which he did under cover of night. The forces of Dian Mananghe rallied round the signal of the burning village and were speedily after him, and he had enough to do to get clear of the skirts of the place and avoid the huge fragments of rock that were thrown down from the adjacent heights. The valley of the Mandrerei, very narrow at first, increases in width as it approaches the sea. Champmargou at length gained the open plain, but already all the forces of Dian Mananghe were collected behind him in pursuit and fast gaining on him, until another body of men appeared in his front. Seeing nothing left him but a desperate battle, he moved rapidly on these, and was prepared to fight his way through them, when he recognized La Caze, who had come at the head of a numerous band of Andrafares. On this, Champmargou, finding the succour he had so long hoped for, speedily turned round and, valliantly supported by his ally, fell on the forces

of Mananghe and, after a severe contest, entirely routed them. But La Caze took the handsomest part in this affair.

The troops of Dian Mananghe were massacred. The Andrafares, their sworn enemies, beat them with great slaughter, and he himself narrowly escaped with his life. After this brilliant success, the French set out to return to the fort; but a fact occurs here which will convey some idea of the soothing system employed by the colonists. A young man, who commanded a detachment forming the rear-guard, relates himself that having made four prisoners he killed three of them, and being told that the fourth was the parent of Dian Mananghe, he cut off his hands and ears!" "He was much more punished this way," adds the author of the transaction, "than if he had been served like the rest, preferring death to this. I told him to go and find Dian Mananghe, and tell him that if we caught him he should be served in the same way."

While Champmargou returned to the fort and sent his allies home, after dividing their spoils, La Caze pursued Dian Mananghe, who, allowing himself to be followed, posted himself in the neighbourhood of the fort, and in his turn again blockaded the French, now reduced to their own numbers. La Caze, with the negroes of Dian Nong and Dian Ramahirac, went in search of Dian Mananghe as far as the Matatanes country, where he strengthened his numbers. But having found him nowhere, decided on returning to the fort. The garrison was at its last gasp. The men that La Caze had placed to guard the booty which he had taken in the North had been attacked, and had always been a very weak party. All that remained of the animals had been carried off by Dian Mananghe; a great number of negroes had been killed; the colonists had risen against the missionary, saying that the Pere Etienne and he were the cause of all their misfortunes;—in fact, Champmargou was no longer able to restrain them.

The arrival of La Caze changed all this. On his approach Dian Mananghe disappeared, and much as the discouragement had been in the absence of La Caze, the rejoicings were as great when they saw him return with his troops escorting 5,000 head of cattle. At the same time the arrival of the ship *St. Paul* was signalled.

(To be continued.)

ON COILING SUBMARINE TELEGRAPH CABLES,—*By Captain L. G. Heath, H.M.S. "Arrogant."*

During the progress of the preparations for laying the original Atlantic Telegraph Cable, I, like many other naval officers, took much interest in the proposed arrangements, and believing that one source of possible accident was the tendency under certain circumstances of

all rope to form kinks, I wrote to the Chairman of the Board of Directors on the subject, and received a reply, stating that it had not escaped the notice of the company's engineer, and that means had been devised for avoiding the anticipated danger.

I have recently seen a pamphlet published by the Institution of Civil Engineers, containing reports of some very interesting papers read before that society, from which I learn that the "means" referred to, consisted in the use of Newall's cones and rings, and as the efficacy of Mr. Newall's contrivance is much insisted on in one part of the pamphlet as a *preventive* of kinking, whereas (although a most useful auxiliary to the paying out apparatus) it in no way affects that tendency in the cable, I have thought it right to publish these few pages for the consideration of those who are interested in the laying down of submarine wires.

In all spirally twisted rope there is a certain state as to the amount of twist which may be called the normal state—a state in which there is no tendency in the rope when freed from all external agency to revolve either one way or the other—but if by any means an additional twist should be put into the rope, whilst in this normal state, it will have a tendency to untwist itself, whilst on the other hand if a twist is taken out, it will have a tendency to twist itself up again. It is in this normal state that the cable is delivered by the manufacturer. It is generally wound on a drum, and if it could be payed out direct from that drum by its revolution round its axis, it would be submerged in its normal state, and no danger of kinking would arise. This was the plan adopted in laying the Black Sea Telegraph Cable during the Russian war, and it should be and probably is adopted for all short lines; but the impossibility of coiling such a mass as the Atlantic Cable on one drum, or of controlling its speed if it were so coiled, and the difficulty of connecting the ends if the cable were divided into parts and coiled on several smaller drums to be used in succession, seem to render this plan impracticable for long cables; they are therefore transferred from the manufacturer's drum to the hold of the laying out ship, where they are most carefully coiled on flat platforms. It is this coiling which produces a tendency to the formation of kinks, because for every circle made in the process an extra twist (beyond the normal number) is put into the rope, which extra twist remains in the rope when it is payed out, as may be shown to those new to the subject by the following simple experiment.

Take twenty or thirty fathoms of rope in its normal condition as to twist, and place it straight along the ground so that it shall represent the rope when just completed in the manufacturer's rope walk, paint a line along the whole length of its upper surface, and then, making one end fast to a low peg in the ground, imitate the process of coiling it into a ship's hold, count the number of circles formed, and laying hold of the last coiled end walk away with it (as if the cable were being submerged) until the rope is again stretched out, and you will see the painted line spirally wound round with a number of turns equal to the number of circles made in the first part of the experiment. Now

this is, on a small scale, exactly what happens when a larger cable is coiled in and laid out from a ship in the usual manner: a number of twists in excess of what I have called the normal number are put into the cable, and in that state is the cable laid out. If in your experiment you have used a cable of the ordinary stiffness and rigidity, you will have seen plainly how these extra twists tend to form the much dreaded kinks. In shoal water on a regular bottom the danger is but small, because the friction of the rope on the ground will prevent the twists working up towards one another; but in deep water with rough bottom, the cable will, as has frequently been suggested, perhaps hang suspended between distant points, and it is then more than probable that these twists will work up by a sort of wormlike motion towards one another, and form knots of kinks such as were described in *The Times* newspaper as having been found in the Atlantic Telegraph Cable, when hove in by the *Agamemnon* during the experimental trial of May 31st, 1858.

Newall's cones and rings are valuable contrivances for preventing the formation of kinks whilst the cable is leaving the ship, but they do not destroy the materials of which kinks are formed. Those materials, under the common system of coiling, leave the ship with the cable and are evermore present with it, ready to develope themselves as kinks whenever favourable circumstances arise.

The remedy which I propose is to coil the successive sheaves alternately right and left handed, so that the right handed twists formed in one sheave will be exactly neutralized by the left handed twists in the next, and the cable will thus be submerged in its normal state.

In submitting this plan for the consideration of those engaged in the operations of submarine telegraphy, I would wish most earnestly to impress upon them that, considering the impossibility of recovering a cable when once submerged in deep water, it is all important that every possible precaution should be taken for ensuring its submergence in its most natural and therefore most enduring position, and whilst no possible harm can arise from the adoption of my plan, it is quite within the limits of possibility to suppose that had it been made use of by the Atlantic Telegraph Company, their cable might have been in working order at this moment.

P.S.—In the pamphlet to which I have referred as published by the Institution of Civil Engineers it is stated that "although a twist is put into the cable by the process of coiling it is exactly taken out by the process of uncoiling." I would remind those who agree in that opinion that for twists to be taken out of a rope it is necessary that one end of that rope should be able to revolve, and that this condition is not present in the submergence of a submarine cable, as one end is fast to the shore and the other beneath the coil in the hold of the ship. There is this essential difference between coiling in and paying out, viz., that in the former case the shore end is free to revolve and does revolve, but in the latter case both ends are fixed.

The "Great Eastern."

Disaster seems to follow up the *Great Eastern*. She is no sooner free from all her difficulties ashore, clear of her contractors' affairs, clear even of those doubtful trials of the intricate navigation of the Thames, clear of the flats, and in as full speed down channel as her trim would allow, with light hearts and cheerful happy faces on board,—than all on a sudden there is a catastrophe to silence all that, to spread dismay and confusion where all was joy and regularity, and to scatter sorrow where some have not, and thankfulness and gratitude among those who have, escaped the fearful disaster which has taken place.

A graphic description has appeared of her progress from off Deptford and her way down Channel, of her having realized some eleven or twelve knots in smooth water when out of trim, as a kind of promise of what she was to do when in trim,—how she made nothing of half a gale of wind while other common diminutive craft could scarcely show themselves, and though she might not be so easy when in the trough of the sea as she was in the Thames, all went as it should do till she was somewhere off Hastings. Here we read that after dinner,—"About a dozen gentlemen remained in the dining-room conversing with one of the directors, a health had been proposed, and each glass was held aloft to do honour to the toast, when suddenly an indescribable report burst upon their ears, and showers of broken glass and fragments of wood and iron came crashing the skylight. There was first a pause, then a mutual caution against panic, and finally a simultaneous rush to the staircase." It is stated—

"The whole atmosphere at this place was filled with steam, through which we all ascended half suffocated to the deck. The ship was still pressing onward, like a horse that had lost its rider, and at either end all was still and deserted, while in the centre all was smoke, fire, vapour, and confusion. The great funnel, eight tons weight, had been shot up as if from a mortar many feet into the air, and had returned broken in two pieces on the deck, the immense strength of which had been sufficient to arrest its further downward progress. The whole centre of the ship seemed to be only one vast chasm, and from it was belching up steam, dust, and something that looked ominously like incipient conflagration."

This state of things is described as most appalling, but the cause of all this mischief was simple enough, and can be made intelligible by a very few words of explanation. From the plan of her construction requiring that the cabins should run along the whole length of the deck, it became necessary that her funnels should run up through their centres, and the plan of surrounding the foremost one with what is called a "water jacket" was adopted, consisting of an outer tubing round the base and up a portion of the sides (forty feet) of the funnel, the space within it forming an annular boiler. This was to be kept constantly filled with water, and was to serve the purpose of supplying

hot water to the boiler, any steam in it to be carried off by a pipe, and a "tap" being provided which was to act as the safety-valve of the jacket. It is to be observed of this contrivance that it had long before been condemned as unsafe—even the Americans, who are not over-cautious, having abandoned it, and substituted air-jackets to keep the saloons cool. When the funnel blew up it tore away everything. Decks, cabins, and below them, again, steam gearing of every kind. The scalding steam filled the place, and the furnace doors being burst open, fire poured out like burning lava, and burnt the doomed men on one side, whilst the death vapour scalded them on the other. Five lives have been thus sacrificed, but the number of sufferers has far exceeded that.

Such has been the result of this unfortunate accident, and as the observations of the Coroner are interesting we annex them along with the verdict, which however fails to single out any person or persons to whom the real blame is to be attached.

The Coroner observed that although there were questions which he should have to submit to the jury in reference to the cause of the accident very easy to decide, there was another question that would be more difficult, namely, who were the persons in charge of the engines at the time of the accident, and whether it was the duty of such persons to take care that the cock at the top of the syphon was open from day to day. They had the evidence of Mr. Arnott that on the Tuesday previous to the starting he went round and examined the cocks, and saw them open. It was, however, for the jury to say whom they considered in charge of the engines, Mr. Arnott, Mr. Dixon, or Mr. M'Lennan. He certainly confessed that it struck him with some degree of astonishment that the company themselves should have started upon the voyage without having some more definite or precise understanding as to the person who should be in charge of the vessel and the engines. Mr. Scott Russell, on the one side, positively asserted that his contract was completed on the 6th of August, and had nothing whatever to do with the trial trip, and that all of the men excepting Mr. Dixon, who was invited as a friend, had left his service and signed articles which made them the servants of the company; and he stated also that neither he nor Mr. Dixon had anything to do with the arrangement of the vessel. The first witness, Mr. Briscoe, certainly gave his evidence in a most satisfactory manner. He told them that from the beginning the engines did not work well, and upon that point it must have struck them all that the evidence of Mr. Arnott was not given in that manner which would inspire confidence. The real question was whether Mr. Russell, or Mr. Dixon, or Mr. Arnott, was in charge of those paddle-wheels, and if they were in charge, whether their conduct was such as to render them liable to a charge of manslaughter.

The learned Coroner then went at very considerable length through the evidence, reading a great portion of it, and in the end he left it for the jury to say whether this was a simple accident, or whether, under the circumstances, they thought such a degree of responsibility

had been incurred as would justify them in calling upon any person to answer for the death of the unfortunate men killed by the explosion.

The jury retired about half past eight, and returned into court about ten, when the verdict was given:—

"We find that the deceased came to their deaths from injuries received from steam, hot air, and water, in consequence of the bursting of the jacket attached to the foremost funnel of the *Great Eastern* steamer, and that the said bursting was caused by the closing of a tap connected with the syphon attached to the said jacket in conjunction with the shutting off the feed from the water-casing to the boilers, but there is no evidence before the jury to show by what person or persons the said tap was shut off; and the jury further express their opinion that taps are highly dangerous when placed in such positions, and that sufficient caution was not used by the engineers."

The *Great Eastern* is now lying at Portland, some weeks being required for the repair of this accident, and, unhappily, a large amount of money. She has come well out of this ordeal, her strength enabling her to withstand the shock, but she has yet to go through that of wind and sea.

PROCEEDINGS IN CHINA.—*Official Despatch.*

Admiralty, September 16th.

A despatch, of which the following is a copy, has been received by the Lords Commissioners of the Admiralty from Rear-Admiral James Hope, C.B., Commander-in-Chief of her Majesty's ships and vessels on the East India and China station.

Chesapeake, Gulf of Pecheli, July 5th.

Sir,—I request you will inform the Lords Commissioners of the Admiralty that having on the 17th ult., arrived off the Island of Shalui-tien, in the Gulf of Pecheli, where I reported in my letter No. 66, of the 11th ultimo, the squadron had been directed to rendezvous, I proceeded on the following day to the mouth of the Pei-ho river, with the object of intimating to the local authorities the intended arrival of the Honourable Frederick Bruce, her Majesty's Plenipotentiary and Envoy Extraordinary, and Monsieur de Bourboulon, Minister of his Imperial Majesiy the Emperor of the French, and of reconnoitring the existing state of the defences of the river.

These last appeared to consist principally of the reconstruction, in earth, and in an improved form, of the works destroyed last year, strengthened by additional ditches and abattis, as well as an increased number of booms of a very much more formidable nature, a description of all of which will be found on the annexed plan, furnished by Major Fisher of the Royal Engineers. Very few guns were seen, but

a considerable number of embrasures were masked with matting, evidently with a view of concealing others.

Having sent an officer on shore to communicate with the authorities, he was met by a guard, apparently of country people, who prevented him from landing, informed him that there were no officials nearer than Tient-sin, and on his acquainting them with my wish that the obstructions at the mouth of the river should be removed, in order to enable the ministers to proceed to Tient-sin, a promise was given that a commencement should be made for this purpose within the next forty-eight hours.

On the following day I moved the whole of the squadron up to the anchorage off the mouth of the river, placing the gunboats inside the bar. On proceeding to examine the entrance, on the 20th, and finding that nothing had been done towards removing the obstructions before referred to, I addressed a letter to the Tantai, at Tient-sin, acquainting him with the object of my arrival, and requesting free communication with the shore. To this an evasive answer was received two days subsequently.

On the 21st I received a letter from Mr. Bruce, acquainting me that M. de Bourboulon and himself had come to the conclusion to place the matter in my hands, and requesting me to take any measures I might deem expedient for clearing away the obstructions in the river, so as to allow them to proceed at once to Tient-sin; in consequence of which I acquainted the Tantai, that the ministers having arrived, and the obstructions still existing at the mouth of the river, I should proceed to remove them, using force if necessary, the responsibility of the consequences resting with those by whom I might be opposed. To this communication no reply was received, and consequently on the 24th I took the force inside the bar to prepare for operations, and gave further intimation that after eight o'clock in the evening, if I received no satisfactory reply, I should feel myself at liberty to take my own course.

On the same night the parties named in the margin,* under the direction of Captain G. O. Willes, cut one of the cables of the boom, marked *d* in the plan, and blew two away with powder. These last, however, were found re-united on the following day, the supporting logs of wood to which they were cross-lashed being probably moored head and stern. Captain Willes availed himself of this opportunity to examine closely the construction of the inner boom (plan *e*), and he found it to consist of large baulks, well cross-lashed together, forming a mass of timber not less than 120 feet wide, and about 3 feet in depth. The opening shown in the plan might have admitted of the passage of a gunboat, but the strength of the current would, at any time, have rendered such a passage a matter of exceeding difficulty and doubt. Under these circumstances it was clear that no other

* *Chesapeake*—Lieutenant J. C. Wilson, Mr. S. R. Broom, gunner and six seamen. *Magicienne*—Mr. F. W. Egerton, acting-mate, and six seamen. *Cruiser*—Mr. W. Hartland, boatswain, and six seamen.

mode of attack was left open to me, except that on the front of the works, and a subsequent endeavour to carry them by storm, should I succeed in silencing their fire.

The morning of the 25th was occupied in placing the vessels in position (see plan), *Starling*, *Janus*, *Plover* (flag), *Cormorant*, *Lee*, *Kestrel*, and *Banterer*, being on a line parallel to the works on the South fort, and the *Nimrod* in the rear of the line, with her fire bearing on the North fort. The *Opossum*, under Captain Willes, was placed in advance, close up to the stakes, and the *Forester* and *Haughty* in reserve in rear of the line, the former having directions to move up into the *Plover's* position, should that vessel advance in support of the *Opossum*.

The vessels on the right were under the directions of Captain C. F. A. Shadwell; those on the left under Captain N. Vansittart. The strength of the tide and the narrowness of the channel (about 200 yards) had rendered it a matter of extreme difficulty to take up the position above detailed; and the *Banterer* and *Starling*, the vessels on the extreme right and left of the line, had both taken the ground, the former, however, in a good position, the latter in one which incapacitated her from taking much share in the action.

At 2h. p.m., I directed the *Opossum* to open a passage through the first barrier, which being effected by 2h. 30m., she moved up to the second barrier, supported by the *Plover*, closely followed by the *Lee* and *Haughty*, which vessels I ordered in for that purpose.

On the arrival of the *Opossum* at the second barrier, the forts opened a simultaneous fire of not less than between thirty and forty guns, of calibres from 32-pounders to 8-inch, on which I directed the ships to engage. The *Plover* took up a position close to the barrier. The *Opossum*, *Lee*, and *Haughty*, in succession, astern of her.

At 3h. p.m.,* finding that the ships inside the barrier, especially the *Plover* and *Opossum*, were becoming disabled by the enemy's fire, they were dropped out into fresh positions outside of it, where, having received assistance in men, they renewed the action.

In consequence of the *Plover's* disabled state, I shifted my flag to the *Cormorant;* and at 4h. 20m. a severe wound I had received about an hour previously compelled me to call Captain Shadwell on board the *Cormorant*, and entrust to him the more immediate command of the squadron.

At 5h. 40m. the *Kestrel* sunk in her position; and it became necessary to put the *Lee* on the ground to avoid the like result.

At 6h. 30m. the fire from the North forts ceased altogether, and half an hour later that on the South side was silenced, with the exception of that proceeding from one gun in the outer or South bastion, one in the curtain on each side of it, and one in the flank of the centre bastion, also one in the detached fort to the South.

At 7h. 20m. a landing was effected opposite the outer bastion of the

* At this time, Lieutenant Rason, of the *Plover*, was killed, and I placed Lieutenant G. A. Douglas, my flag-lieutenant, in temporary command of her.

South fort, the portion which appeared most injured by the fire of the squadron, and where the attack could be best supported by the guns of the vessels. The force consisted of a detachment of Sappers and Miners, under Major Fisher, Royal Engineers; a brigade of Marines, under Colonel Thomas Lemon; a division of Seamen, under Captain Vansittart, assisted by Commanders J. E. Commerell and W. A. J. Heath, the whole under Captain Shadwell's direction, accompanied by a small detachment of French seamen, under the command of Commandant Tricault.

They were encountered by a heavy fire proceeding from those guns I have already named as not completely silenced, as well as from gingalls and rifles; but notwithstanding these and other serious obstacles presented by the character of the ground to be crossed, and the nature of the defences, 150 officers and men having reached the second ditch, and about 50 having arrived close under the walls, had the opposition they experienced been that usual in Chinese warfare, there is little doubt that the place would have been successfully carried at the point of the bayonet.

Captains Shadwell and Vansittart and Colonel Lemon, R.M., having been disabled in the advance, the command in front devolved on Commander Commerell, who, after consultation with Majors Fisher, R.E., and Richard Parke, R.M., and Commandant Tricault, having reported to Captain Shadwell that they could hold their present position, but that it was impossible to storm without reinforcements, received from that officer the order to retire.

This operation was effected with a deliberation and coolness equal to the gallantry of the advance, under cover of the night, which had now closed in, the force being sent down to the boats by detachments, carrying the wounded with them, and eventually the whole were brought off by 1h. 30m. a.m. of the 26th, Commanders Commerell and Heath being the last on shore.

I have already stated that the *Lee* and *Kestrel* had sunk in their positions from the effect of the enemy's fire; and I regret to add that in proceeding down the river after the termination of the action the *Plover* was grounded within range of the forts, and the *Cormorant*, in endeavouring to remove, was also found to have taken the ground. Under these circumstances I desired the officers and men to be removed from them for the time in order to obviate the loss which might occur should the enemy be enabled to re-open their fire.

The *Kestrel*, I am happy to say, has since been recovered; but, notwithstanding every exertion which was subsequently made, under the direction of Captain Willes, to recover the three other vessels, the *Plover* and *Lee* proved to be so hopelessly aground, that it was impossible to move them; while the *Cormorant*, which got afloat comparatively uninjured on the night of the 27th, was again unfortunately grounded, within range of the forts, on moving down; and on the following day such a heavy fire was opened on her, that although again afloat, she sank at her anchors, and the officers and men employed in removing her were withdrawn as she went down.

The fire of the enemy being remarkably well directed and sustained, occasioned the squadron considerable loss, amounting to 25 officers and men killed, and 93 wounded, of which 54 are slight. Among the former I have to regret the loss of Lieutenant W. H. Rason, commanding the *Plover*, a very promising young officer, and Captain T. M'Kenna of the 1st Royals, who was attached to me by the Major-General commanding the forces in China.

In the subsequent attack on shore 64 officers and men were killed, and 252 wounded, of which 90 are slight. Amongst the former I have to regret the loss of Lieutenant A. Graves, of the *Assistance;* Lieutenant C. H. Clutterbuck, and Mr. T. H. Herbert, Midshipman, both of this ship; of Lieutenant H. Wolrige, R.M.; and Lieutenant H. L. T. Inglis, R.M., of the *Highflyer*, attached to the 2nd battalion.

Amongst the severely wounded are Captain Shadwell, C.B., of H.M.S. *Highflyer;* Captain Vansittart, C.B., of H.M.S. *Magicienne;* Acting-Lieutenant C. E. Buckle, of H.M.S. *Magicienne;* Mr. A. J. Burniston, Master of the *Banterer;* Mr. N. B. Smith, Acting-Mate of the *Chesapeake;* Mr. A. Powlett, Midshipman of the *Fury;* Mr. G. Armytage, Midshipman of the *Cruiser;* Mr. W. Ryan, Gunner of the *Plover;* Lieutenant G. Longley, R.E.; Colonel Lemon, R.M.; Captain W. G. R. Masters, R.M., H.M.S. *Chesapeake;* Lieutenant J. C. Crawford, R.M.A.; and the Rev. H. Huleatt, Chaplain to the Forces. The loss on the part of the French amounted to 4 men killed and 10 wounded, including 2 officers, one of the latter, I regret to state being Commandant Tricault.

My warmest thanks are due to Staff-Surgeon Walter Dickson *(b)*, of this ship, Dr. John Little, of the Royal Marine Brigade, and the medical officers of the force generally, to whose unwearied exertions I have to attribute the present satisfactory state of our wounded; and I avail myself of this opportunity of bringing under their Lordships' special notice the very high terms in which Colonel Lemon speaks of the services of Dr. W. J. Baird, Senior Assistant-Surgeon of the brigade.

It is a more grateful duty to request you will bring under their Lordships' notice the valuable assistance I received from Captains Shadwell and Vansittart, in command of the respective divisions of gunboats. Lieutenant John Jenkins is highly recommended by Captain Shadwell for the way in which he fought the *Banterer*.

Captain Vansittart speaks highly of Acting-Commander R. J. Wynniatt, of the *Nimrod;* Lieutenant A. J. Innes, of the *Forester;* Lieutenant J. D. Bevan, of the *Kestrel;* and Lieutenant W. H. Jones, of the *Lee*, whose able conduct in covering the landing, after he had been obliged to put his vessel on the ground to prevent her sinking, had also attracted my notice.

To Commander A. Wodehouse, of the *Cormorant*, Lieutenants C. J. Balfour, of the *Opossum*, J. D. Broad, of the *Haughty*, and H. P. Knevitt, of the *Janus*, my thanks are also due for the manner in which their vessels were fought and handled.

My thanks are also due to Major Fisher, R.E., whose men being

distributed as riflemen in the gun-vessels and gunboats, was himself on board the *Plover*.

The *Nozagavy*, French gunboat, not being armed in a manner which enabled her to share in the attack, M. Tricault, Commandant of the *Duchayla*, did me the honour to attach himself to me from the commencement of the action until he landed.

Mr. J. W. Ashby, my Secretary, besides being on duty with me, took charge of the signal duty when my Flag-Lieutenant took command of the *Plover*.

To Commanders J. E. Commerell and W. A. J. Heath, for their conduct during the operations on shore, my warmest acknowledgments are due. Commander Commerell brings under my notice Lieutenants G. Parsons and J. C. Wilson, of the *Chesapeake*, and C. E. Buckle, acting, of the *Magicienne;* Messrs. G. S. Peard, J. Short, and Viscount Kilcoursie, Mates; and Messrs. G. Armytage and C. L. Oxley, Midshipmen.

To Colonel Lemon my warmest acknowledgments are also due for the way in which he led the Brigade. That officer strongly recommends Major Parke, who commanded the First, and Captain Masters, who commanded the Second, Battalion, and brings under my notice the assistance he received from Captain P. M. C. Croker, Brigade-Major, Lieutenant L. Rokeby, acting as his Aide-de-Camp, Lieutenants and Adjutants J. F. Hawkey and H. L. Evans, and Lieutenant J. Straghan. The conspicuous gallantry of Sergeant-Major Woon and Quartermaster-Sergeant Halling also attracted his notice.

Major Fisher, R.E., speaks highly of the gallantry of Lieutenant J. N. Maitland, R.E., in endeavouring to get the scaling ladders up, a service in which Lieutenant Longley, R.E., was also engaged and unfortunately wounded.

To Captain J. O. Willes my warmest thanks are due for his exertions in re-embarking the force when it became evident that the attack had failed, on which service he remained till Commander Commerell reported to him that the last man was re-embarked. He speaks highly of Lieutenant J. C. Wilson and Mr. J. St. John Wagstaffe, assistant paymaster, on that occasion (the latter of whom accompanied him throughout the day).

Upon Captain Willes also devolved the arduous duty of directing the gallant attempts which were subsequently made to recover the *Plover*, *Lee*, and *Cormorant*, and when that became hopeless, to effect their destruction, and to his unwearied zeal I am indebted for carrying out the repairs of the gunboats, all of which have been placed on the ground for that purpose.

He speaks highly of all the officers and men employed on this service, and especially of the gallantry of Lieutenant N. P. Knevitt, of the *Janus*, in laying out an anchor for the recovery of the *Cormorant*, under a heavy fire, and of that of Mr. O. Sampson, Second-Master of the *Starling*, who recovered that vessel, under a sharp fire from the enemy on her floating; of the efforts made by Lieutenant Wilson

and Mr. S. R. Broome, gunner, of the *Chesapeake*, to destroy the vessels which were no longer recoverable; and of the energy displayed by Mr. W. D. Strong, Master of the *Cruiser*, in raising the *Haughty*, which had sunk.

He further calls my attention to the exertions of the carpenters of the *Assistance*, *Cruiser*, and *Magicienne*, under the direction of Mr. R. Pickard, of this ship, who in effecting the repairs of the gunboats, with the artificers of the squadron, had many difficulties to surmount.

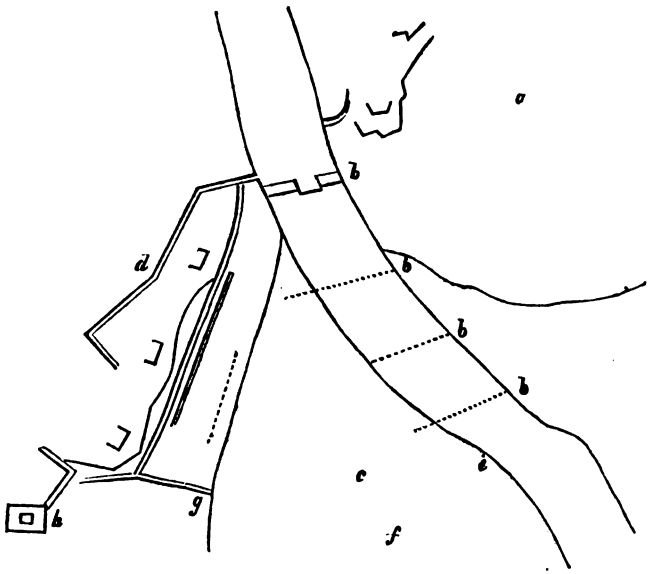
From what has preceded, their Lordships will be well able to appreciate the devoted gallantry displayed by the officers and men on this occasion; and although it has not pleased God to crown our efforts in the execution of our duty with success, I yet feel entire confidence that those efforts will obtain from their Lordships that full measure of approbation they have so well deserved.

I have, &c.,

J. HOPE,

Rear-Admiral and Commander-in-Chief.

To the Secretary of the Admiralty.



a. Fort 19 guns.
b. Booms across the Peiho.
c. Mud at low water.
d. Parapet and batteries 58 guns, with ditches in front.
e. Landing place.
g. Creek.
h. Fort 10 guns.

The following is from a letter written by one of the few who crossed the third ditch in the attack on the forts and survived to rejoin his ship:—

Off the Peiho Forts, June 28th.

Major Parke, Smith, Wolridge, Huleatt (Chaplain to our battalion), and myself were in the first boat that touched the beach. The water was about four feet deep where the men jumped out. I, like a muff, did not wait to go forward, but jumped over the stern of the boat, and was nearly drowned, but, fortunately, I got hold of an oar and scrambled in again. I was wet all over; however it did not matter much, as you will see. We had to walk 200 yards under a heavy fire before the water was knee-deep. We lost a good many men, as we got into the mud, which was very deep. One round shot knocked over ten of our men. It was impossible to form properly because of the mud and the heavy fire. Poor Huleatt did not go a dozen yards before he got a shot in the thigh. I went up to give him assistance; he asked me for my pocket handkerchief to tie up his wound. I was in the act of handing it to him when a shot hit me on the side of the head, and over I went at Huleatt's feet, stunned for the moment. I was soon on my feet again, and, throwing Huleatt my pockethandkerchief, trudged on as well as I could. My goodness! did we not get it now? We were about 200 yards from the wall, and subjected to all the cross fires. I suppose we lost 100 marines in the space of as many yards.

The forts we thought were silenced opened fire on us. I never saw such slaughter. Poor fellows! they were carried off half-a-dozen at a time. Here were we, 350 marines and a few blue jackets, storming a fort manned by 20,000 men, of whom many were Europeans in the pay of the Chinese Emperor, and 300 cannon. There were no supports to back us up, and we went on to almost certain death. All the ladder party were killed but two, and several ladders smashed by round shot. At last, after an hour's struggle, we reached the first ditch. Colonel Lemon got on the bank, and ordered the advance to be sounded. Some of us jumped down into the ditch, but were rather sold, for, instead of finding it knee-deep, it was out of our depth. Many men were shot going over the bank, some only slightly wounded rolled down the bank and were drowned in the ditch. I was one of the first to jump down. I never swam before in my life. I don't know how it was, I got across somehow or other. When they found it was so deep they ordered up the ladders to cross on; several were broken in getting the men across. After going some short distance knee-deep in mud we came to the second ditch; this was a dry one, and was composed of very soft mud. You may not credit it, but we were an hour or more crossing this ditch, a distance of about twenty yards. I was nearly left to be smothered in the mud; the men thought I was wounded and were leaving me to go on, at last two or three men of my company dragged me out. The sights we saw at the second ditch are beyond all description. It was here our officers were picked off so.

We were not eighty yards from the wall, and being dressed in red, while the men were in blue, made us conspicuous marks for the enemy's riflemen. (They had rifles, for several of our men were wounded by their balls.) I should say only 250 men crossed the second ditch, the remainder wore *hors de combat* in the mud and ditch. Now came the tug of war. We had crossed two ditches, and the third lay before us, not fifty yards from the wall. We had only three ladders left, and if we broke any of those it was all up with us, as none of our rifles would go off; the ammunition was wet, and the rifles also, besides being choked up with mud. Unless we could put three men at a time on the wall (about thirty feet high) we should stand no chance, as we had nothing but cold steel to fight with. Well, we laid the ladders across, and one or two went over all right. I was holding on to the middle of the ladder, when two or three fellows got on it and it broke, and down I tumbled into the middle of the ditch. I held on to the broken part of the ladder, and managed to get to the bank and scramble up. When I got on to the bank there was a nice spectacle before me, the walls covered with men not more than thirty-five yards' distance. When they saw me they gave a volley. I don't know how it was I escaped. My clothes were cut to pieces, and yet, with the exception of a few scrapes here and there, I was all right. Was it not a pity all the ladders were broken? And here were we looking on, while the enemy stood on the walls picking us off at their leisure. In front of us the mud was covered with spikes and *chevaux de frise* close under the walls. We had not been here half an hour before every officer was hit. It was now orders came for us to retreat. Parke now commanded us, for Lemon and Masters were both badly wounded. I suppose we stayed in front an hour and a half after the retreat sounded, so as to cover the wounded to the boats. Now, to make a long matter short, we had to go through the same obstacles and fire, and it took much about the same time.

FATE OF SIR JOHN FRANKLIN'S EXPEDITION.—*Return of Captain M'Clintock, R.N.*

The *Fox* screw discovery vessel, (Captain M'Clintock), which was sent to the Arctic regions at the expense of Lady Franklin, to discover traces of the missing expedition, arrived off the Isle of Wight on the 21st September, and is now in the East India Docks. The following is Captain M'Clintock's interesting report:—

Yacht Fox, R.Y.S.

Sir,—I beg you will inform the Lords Commissioners of the Admiralty of the safe return to this country of Lady Franklin's Final Searching Expedition, which I have had the honour to conduct.

Their Lordships will rejoice to hear that our endeavours to ascertain the fate of the "Franklin Expedition" have met with complete success.

At Point Victory, upon the North-West coast of King William Island, a record has been found, dated the 25th of April, 1848, and signed by Captains Crozier and Fitzjames. By it we were informed that H.M.S. *Erebus* and *Terror* were abandoned on the 22nd of April, 1848, in the ice, five leagues to the N.N.W., and that the survivors,—in all amounting to 105 souls, under the command of Capt. Crozier,—were proceeding to the Great Fish River. Sir John Franklin had died on the 11th of June, 1847.

Many deeply interesting relics of our lost countrymen have been picked up upon the western shore of King William Island, and others obtained from the Esquimaux, by whom we were informed that subsequent to their abandonment one ship was crushed and sunk by the ice, and the other forced on shore, where she has ever since been, affording them an almost inexhaustible mine of wealth.

Being unable to penetrate beyond Bellot Strait, the *Fox* wintered in Brentford Bay, and the search—including the estuary of the Great Fish River and the discovery of 800 miles of coast line, by which we have united the explorations of the former searching expeditions to the North and West of our position with those of Sir James Ross, Dease, Simpson, and Rae to the South—has been performed by sledge journeys this spring, conducted by Lieutenant Hobson, R.N., Captain Allen Young, and myself.

As a somewhat detailed report of our proceedings will doubtless be interesting to their Lordships, it is herewith enclosed, together with a chart of our discoveries and explorations, and at the earliest opportunity I will present myself at the Admiralty to afford further information, and lay before their Lordships the record found at Port Victory.

I have, &c.,

F. L. M'CLINTOCK, *Captain, R.N.*

To the Secretary of the Admiralty, London.

Proceedings of the Yacht "Fox," continued from May, 1858.

It will be remembered that the *Fox* effected her escape out of the main pack in Davis Straits, in lat. 63½° N., on the 25th of April, 1858, after a winter's ice drift of 1,194 geographical miles.

The small settlement of Holsteinborg was reached on the 28th, and such very scanty supplies obtained as the place afforded.

On the 8th of May our voyage was recommenced; Godhaven and Upernivik visited, Melville Bay entered early in June, and crossed to Cape York by the 26th; here some natives were communicated with; they immediately recognised Mr. Petersen, our interpreter, formerly known to them in the Grinnell expedition under Dr. Kane. In reply to our inquiries for the Esquimaux dog-driver "Hans," left behind from the *Advance* in 1858, they told us that he was residing at Whale Sound. Had he been there I would most gladly have embarked him, as his longing to return to South Greenland continues unabated.

On the 12th of July communicated with the Cape Warrender natives, near Cape Horsburgh; they had not seen any ships since the visit of the *Phœnix* in 1854, nor have any wrecks ever drifted upon their shores.

It was not until the 27th of July that we reached Pond Inlet, owing to a most unusual prevalence of ice in the northern portion of Baffins Bay, and which rendered our progress since leaving Holsteinborg one of increasing struggle, Without steam power we could have done nothing. Here only one old woman and a boy were found, but they served to pilot us up the inlet for twenty-five miles, when we arrived at their village. For about a week we were in constant and most interesting communication with these friendly people. Briefly, the information obtained from them was, that nothing whatever respecting the Franklin expedition had come to their knowledge, nor had any wrecks within the last twenty or thirty years reached their shores.

The remains of three wrecked ships are known to them; two of these appear to have been the whalers *Dexterity* and *Aurora*, wrecked in August, 1821, some seventy or eighty miles southward of Pond Inlet. The third vessel, now almost buried in the sand, lies a few miles East of Cape Hay. This people communicate overland every winter with the tribes at Igloolik; they all knew of Parry's ships having wintered there in 1822-3, and had heard of late years of Dr. Rae's visit to Repulse Bay, describing his boats as similar to our whale boat, and his party as living in tents, within snow-houses, smoking pipes, shooting reindeer, &c. None died. They remained there only one winter.

No rumour of the lost expedition has reached them. Within Pond Inlet the natives told us the ice decays away every year, but so long as any remains whales abound. Several large whales were seen by us, and we found among the natives a considerable quantity of whalebone and many narwhals' horns, which they were anxious to barter for knives, files, saws, rifles, and wool; they drew us some rude charts of the inlet, showing that it expands into an extensive channel looking westward into Prince Regent Inlet.

We could not but regret that none of our whaling friends—from whom we had recently received so much kindness—were here to profit by so favourable an opportunity. Leaving Pond Inlet on the 6th of August, we reached Beechey Island on the 11th, and landed a handsome marble tablet, sent on board for this purpose by Lady Franklin, bearing an appropriate inscription to the memory of our lost countrymen in the *Erebus* and *Terror*.

The provisions and stores seemed in perfect order, but a small boat was much damaged from having been turned over and rolled along the beach by a storm. The roof of the house received some necessary repairs. Having embarked some coals and stores we stood in need of, and touched at Cape Hotham on the 16th, we sailed down Peel Strait for twenty-five miles on the 17th, but finding the remainder of this channel covered with unbroken ice, I determined to make for

Bellot Strait on the 19th of August, examined into supplies remaining at Port Leopold, and left there a whale boat which we brought away from Cape Hotham for the purpose, so as to aid us in our retreat should we be obliged eventually to abandon the *Fox*. The steam launch had been forced higher up on the beach, and somewhat damaged by the ice. Prince Regent Inlet was unusually free from ice, but very little was seen during our run down to Brentford Bay, which we reached on the 20th of August. Bellot Strait, which communicates with the western sea, averages one mile in width by seventeen or eighteen miles in length. At this time it was filled with drift ice, but as the season advanced became perfectly clear; its shores are in many places faced with lofty granite cliffs, and some of the adjacent hills rise to 1,600 feet; the tides are very strong, running six or seven knots at the springs. On the 6th of September we passed through Bellot Strait without obstruction, and secured the ship to fixed ice across its western outlet. From here, until the 27th, when I deemed it necessary to retreat into winter quarters, we constantly watched the movements of the ice in the western sea or channel. In mid-channel it was broken up and drifting about; gradually the proportion of water increased, until at length the ice which intervened was reduced to three or four miles in width. But this was firmly held fast by numerous islets, and withstood the violence of the autumn gales. It was tantalizing beyond description thus to watch from day to day the free water which we could not reach, and which washed the rocky shore a few miles to the southward of us!

During the autumn attempts were made to carry out depots of provisions towards the magnetic pole, but these almost entirely failed in consequence of the disruption of the ice to the southward. Lieut. Hobson returned with the sledge parties in November, after much suffering from severe weather, and imminent peril on one occasion, when the ice upon which they were encamped became detached from the shore, and drifted off to leeward with them.

Our wintering position was at the East entrance to Bellot Strait, in a snug harbour, which I have named Port Kennedy, after my predecessor in these waters, the commander of one of Lady Franklin's former searching expeditions. Although vegetation was tolerably abundant, and our two Esquimaux hunters, Mr. Petersen, and several sportsmen, constantly on the alert, yet the resources of the country during eleven months and a half only yielded us eight reindeer, two bears, eighteen seals, and a few waterfowl and ptarmigan.

The winter was unusually cold and stormy. Arrangements were completed during the winter for carrying out our intended plan of search. I felt it to be my duty personally to visit Marshal Island, and in so doing proposed to complete the circuit of King William Island.

To Lieutenant Hobson I allotted the search of the western shore of Boothia to the magnetic pole, and from Gateshead Island westward to Wynniatt furthest. Captain Allen Young, our sailing master, was to trace the shore of Prince of Wales Land, from Lieut. Browne's

furthest, and also to examine the coast from Bellot Strait northward, to Sir James Ross's furthest.

Early spring journeys were commenced on the 17th of February, 1859, by Captain Young and myself, Captain Young carrying his depot across to Prince of Wales Land, while I went southward, towards the magnetic pole, in the hope of communicating with the Esquimaux, and obtaining such information as might lead us at once to the object of our search.

I was accompanied by Mr. Petersen, our interpreter, and Alexander Thompson, quartermaster. We had with us two sledges drawn by dogs. On the 28th of February, when near Cape Victoria, we had the good fortune to meet a small party of natives, and were subsequently visited by about forty-five individuals.

For four days we remained in communication with them, obtaining many relics, and the information that several years ago a ship was crushed by the ice off the North shore of King William Island, but that all her people landed safely, and went away to the Great Fish River, where they died. This tribe was well supplied with wood, obtained, they said, from a boat left by the white men on the Great River.

We reached our vessel, after twenty-five days' absence, in good health, but somewhat reduced by sharp marching and the unusually severe weather to which we had been exposed. For several days after starting the mercury continued frozen.

On the 2nd of April our long projected spring journeys were commenced: Lieutenant Hobson accompanied me as far as Cape Victoria, each of us had a sledge drawn by four men, and an auxiliary sledge drawn by six dogs. This was all the force we could muster.

Before separating we saw two Esquimaux families living out upon the ice in snow huts; from them we learned that a second ship had been seen off King William Island, and that she drifted ashore on the fall of the same year. From this ship they had obtained a vast deal of wood and iron.

I now gave Lieut. Hobson directions to search for the wreck, and to follow up any traces he might find upon King William Island.

Accompanied by my own party and Mr. Petersen, I marched along the East shore of King William Island, occasionally passing deserted snow huts, but without meeting natives till the 8th of May, when off Cape Norton we arrived at a snow village containing about thirty inhabitants. They gathered about us without the slightest appearance of fear or shyness, although none had ever seen living white people before. They were most willing to communicate all their knowledge and barter all their goods, but would have stolen everything had they not been very closely watched. Many more relics of our countrymen were obtained; we could not carry away all we might have purchased. They pointed to the inlet we had crossed the day before, and told us that one day's march up it, and thence four days overland, brought them to the wreck.

None of these people had been there since 1857-8, at which time

they said but litfle remained, their countrymen having carried away almost everything.

Most of our information was received from an intelligent old woman; she said it was on the fall of the year that the ship was forced ashore; many of the white men dropped by the way as they went towards the Great River; but this was only known to them in the winter following, when their bodies were discovered.

They all assured us that we would find natives upon the South shore, at the Great River, and some few at the wreck; but unfortunately this was not the case. Only one family was met with off Point Booth, and none at Montreal Island or any place subsequently visited.

Point Ogle, Montreal Island, and Barrow Island were searched without finding anything except a few scraps of copper and iron in an Esquimaux hiding-place.

Recrossing the strait to King William Island, we continued the examination of its southern shore without success until the 24th of May, when about ten miles eastward of Cape Herschell a bleached skeleton was found, around which lay fragments of European clothing. Upon carefully removing the snow a small pocket-book was found, containing a few letters. These, although much decayed, may yet be deciphered. Judging from the remains of his dress, this unfortunate young man was a steward or officer's servant, and his position exactly verified the Esquimaux's assertion, that they dropped as they walked along.

On reaching Cape Herschel next day, we examined Simpson's Cairn, or rather what remains of it, which is only four feet high, and the central stones had been removed, as if by men seeking something within it. My impression at the time, and which I still retain, is that records were deposited there by the retreating crews, and subsequently removed by the natives.

After parting from me at Cape Victoria on the 28th of April Lieutenant Hobson made for Cape Felix. At a short distance westward of it he found a very large cairn, and close to it three small tents, with blankets, old clothes, and other relics of a shooting or a magnetic station. But although the cairn was dug under, and a trench dug all round it at a distance of ten feet, no record was discovered. A piece of blank paper folded up was found in the cairn, and two broken bottles, which may, perhaps, have contained records, lay beside it, among some stones which had fallen from off the top. The most interesting of the articles discovered here, including a boat's ensign, were brought away by Mr. Hobson. About two miles further to the S.W. a small cairn was found, but neither records nor relics obtained. About three miles North of Point Victory a second small cairn was examined, but only a broken pickaxe and empty canister found.

On the 6th of May, Lieutenant Hobson pitched his tent beside a large cairn upon Point Victory. Lying among some loose stones which had fallen from the top of this cairn, was found a small tin case containing a record, the substance of which is briefly as follows:—

This cairn was built by the Franklin expedition, upon the assumed site of Sir James Ross's pillar, which had not been found. The *Erebus* and *Terror* spent their first winter at Beechy Island, after having ascended Wellington Channel to lat. 77° N., and returned by the West side of Cornwallis Island. On the 12th of September, 1846, they were beset in lat. 70° 5′ N., and long. 98° 23′ W. Sir J. Franklin died on the 11th of June, 1847. On the 22nd April, 1848, the ships were abandoned five leagues to the N.N.W. of Point Victory, and the survivors, 105 in number, landed here under the command of Captain Crozier. This paper was dated April 25th, 1848, and on the following day they intended to start for the Great Fish River. The total loss by deaths in the expedition up to this date was nine officers and fifteen men. A vast quantity of clothing and stores of all sorts lay strewed about, as if here every article was thrown away which could possibly be dispensed with: pickaxes, shovels, boats, cooking utensils, ironwork, rope, blocks, canvas, a dip circle, a sextant engraved "Frederic Hornby, R.N.," a small medicine-chest, oars, &c.

A few miles southward, across Back Bay, a second record was found, having been deposited by Lieutenant Gore and M. des Vœux in May, 1847. It afforded no additional information.

Lieutenant Hobson continued his search until within a few days' march of Cape Herschel, without finding any trace of the wreck or of natives. He left full information of his important discoveries for me; therefore, when returning northward by the West shore of King William Island, I had the advantage of knowing what had already been found.

Soon after leaving Cape Herschel the traces of natives became less numerous and less recent, and after rounding the West point of the island they ceased altogether. This shore is extremely low, and almost utterly destitute of vegetation. Numerous banks of shingle and low islets lie off it, and beyond these Victoria Strait is covered with heavy and impenetrable packed ice.

When in lat. 69° 9′ N., and long. 99° 27′ W., we came to a large boat, discovered by Lieutenant Hobson a few days previously, as his notice informed me. It appears that this boat had been intended for the ascent of the Fish River, but was abandoned apparently upon a return journey to the ships, the sledge upon which she was mounted being pointed in that direction. She measured 28 feet in length, by 7½ feet wide, was most carefully fitted, and made as light as possible, but the sledge was of solid oak, and almost as heavy as the boat.

A large quantity of clothing was found within her, also two human skeletons. One of these lay in the after part of the boat, under a pile of clothing; the other, which was much more disturbed, probably by animals, was found in the bow. Five pocket watches, a quantity of silver spoons and forks, and a few religious books were also found, but no journals, pocket-books, or even names upon any articles of clothing. Two double-barrelled guns stood upright against the boat's side precisely as they had been placed eleven years before. One

barrel in each was loaded and cocked. There was ammunition in abundance, also 30lb. or 40lb. of chocolate, some tea and tobacco. Fuel was not wanting; a drift tree lay within 100 yards of the boat. Many very interesting relics were brought away by Lieutenant Hobson, and some few by myself.

On the 5th of June I reached Point Victory without having found anything further. The clothing, &c., was again examined for documents, note-books, &c., without success, a record placed in the cairn, and another buried ten feet true North of it.

Nothing worthy of remark occurred upon my return journey to the ship, which we reached on the 19th of June, five days after Lieutenant Hobson.

The shore of King William Island between its North and West extremes, Capes Felix and Crozier, has not been visited by Esquimaux since the abandonment of the *Erebus* and *Terror*, as the cairns and articles lying strewed about, which are in their eyes of priceless value, remain untouched.

If the wreck still remains visible it is probable she lies on some of the off-lying islets to the southward between Capes Crozier and Herschel.

On the 28th of June Captain Young and his party returned, having completed their portion of the search, by which the insularity of Prince of Wales Land was determined, and the coast line intervening between the extreme points reached by Lieutenants Osborne and Browne discovered; also between Bellot Strait and Sir James Ross's furthest in 1849, at Four River Bay.

Fearing that his provisions might not last out the requisite period, Captain Young sent back four of his men, and for forty days journeyed on through fogs and gales with but one man and the dogs, building a snow hut each night; but few men could stand so long a continuance of labour and privation, and its effect upon Captain Young was painfully evident.

Lieutenant Hobson was unable to stand without assistance upon his return on board; he was not in good health when he commenced his long journey, and the sudden severe exposure brought on a serious attack of scurvy; yet he also most ably completed his work; and such facts will more clearly evince the unflinching spirit with which the object of our voyage has been pursued in these detached duties than any praise of mine.

We were now, at length, all on board again. As there were some slight cases of scurvy, all our treasured resources of Burton ale, lemon juice, and fresh animal food were put into requisition, so that in a comparatively short time all were restored to sound health.

During our sojourn in Port Kennedy we were twice called upon to follow a shipmate to the grave. Mr. George Brands, engineer, died of apoplexy on the 6th of November, 1858; he had been out deer shooting several hours that day, and appeared in excellent health.

On the 14th of June, 1859, Thomas Blackwell, ship's steward,

died of scurvy; this man had served in two of the former searching expeditions.

The summer proved a warm one. We were able to start upon our homeward voyage on the 9th of August, and although the loss of the engine-driver in 1857, and of the engineer in 1858 left us with only two stokers, yet, with their assistance, I was able to control the engines and steam the ship up to Fury Point.

For six days we lay there closely beset, when a change of wind removing the ice, our voyage was continued almost without further interruption to Godhaven, in Disco, where we arrived on the 27th of August, and were received with great kindness by Mr. Olick, inspector of North Greenland, and the local authorities, who obligingly supplied our few wants.

The two Esquimaux dog-drivers were now discharged, and on the 1st of September we sailed for England.

From all that can be gleaned from the record paper, and the evidence afforded by the boat, and various articles of clothing and equipment discovered, it appears that the abandonment of the *Erebus* and *Terror* had been deliberately arranged, and every effort exerted during the third winter to render the travelling equipments complete.

It is much to be apprehended that disease had greatly reduced the strength of all on board, far more perhaps than they themselves were aware of.

The distance by sledge route, from the position of the ships when abandoned to the boat is 65 geographical miles; and from the ships to Montreal Island 220 miles.

The most perfect order seems to have existed throughout.

In order to extend as much as possible the public utility of this voyage, magnetical, meteorological, and other observations, subservient to scientific purposes, and for which instruments were supplied through the liberality of the Royal Society, have been continually and carefully taken, and every opportunity has been embraced by the Surgeon, D. Walker, M.D., of forming complete collections in all the various branches of natural history.

This report would be incomplete did I not mention the obligations I have been laid under to the companions of my voyage, both officers and men, by their zealous and unvarying support throughout.

A feeling of entire devotion to the cause, which Lady Franklin has so nobly sustained, and a firm determination to effect all that men could do, seems to have supported them through every difficulty. With less of this enthusiastic spirit, and cheerful obedience to every command, our small number—twenty-three in all—would not have sufficed for the successful performance of so great a work.

F. L. M'CLINTOCK, *Captain, R.N.,*
Commanding the Final Searching Expedition.

The yacht Fox, R.Y.S., off the Isle of Wight,
September 21st, 1859.

Thus,—

"The last ray of light that could have illuminated the recesses of those sorrowful regions, which modern investigation has discovered to be darker and more hopeless than the Ultima Thule of ignorant antiquity, has flickered and died out. The ashes are borne home to us;—at last the mystery of Franklin's fate is solved. We know where he died, we know the very day of his death. More than twelve years ago the ardent spirit of JOHN FRANKLIN passed away amid a world of ice and snow. And, indeed, it would seem that the trials of his previous explorations, and the anxieties attendant upon the beginning of his last search for the North-West Passage, had proved too much for his iron frame before the calamities and disasters for which Captain M Clintock has prepared us, came upon the rest of the expedition. The great navigator died in no sudden shock or great disaster; he was crushed by no iceberg, he did not starve miserably on some wandering ice floe, nor did he drift away in storm and ice haze, which cast a veil so thick around him that the survivors can only say, "After that we never saw him more." No! he died surrounded by comrades and friends, and in the discharge of his duty. No soldier or sailor can desire or hope a nobler fate. The condolencies and sympathies of a nation accompany the sorrows of his widow and the griefs of his friends, but it is not altogether out of place for the country to express its satisfaction that the lives of brave sailors were not uselessly sacrificed in a series of expeditions which should have borne for their motto, "Hoping against hope." So far it is satisfactory to know the "Final Search" has proved that Sir John Franklin is dead. Alas! there can be no longer those sad wailings from an imaginary Tintagel to persuade the credulous that an Arthur still lives.

At Point Victory, on the north-west coast of King William Island, a record of the proceedings of the Franklin Expedition was found, dated April 25th, 1848, and signed by Captain Crozier and Captain Fitzjames. The story it told appears to have been simple and sad enough—Sir John Franklin had died nearly ten months before—on the 11th of June, 1847. The Expedition seems then to have worked on as well as it could, and, as soon as the ice permitted, to have proceeded with its mission, but month after month of battle with frost, and ice, and snow passed away—difficulties no doubt were encountered which none of us who sit at home can realize, and on one fatal day, the 22nd of April, 1848, the *Erebus* and the *Terror* were abandoned by their crews, fifteen miles N.N.W. of Point Victory. The "survivors," which is a term that indicates other losses than that of the great seaman who led them, to the number of 105, two days after the abanment of the vessels, reached the island, erected a cairn, concealed the record, and were then about to proceed for the Great Fish River, under the command of Captain Crozier.

Franklin died more than twelve years ago. Since that day they have all shared the fate of their chief, dropping down one after another till the last man perished. Is there any sane man who will now propose that we should seek to enlarge the sphere of our knowledge,

or that we should organize expeditions to find out the fate in detail of the 105 devoted men who, more than eleven years ago, set out, as we have reason to believe, from Point Victory for the Great Fish River? The lives of our gallant officers and men are dear to us all, but surely it is wicked to expose that which we love to risk and loss to gratify a curiosity which deserves almost to be called morbid, in order to furnish us with the exact particulars."

"On the 22nd of April, 1848, as we now know, those two ships were abandoned in the ice, and the survivors, in all amounting to 105 souls, under the command of Captain Crozier, were proceeding to the Great Fish River. Sir John Franklin had died on the 11th of June, 1847, six months before we had begun to wonder what had become of him, and how he had battled out two winters. For ten years past, all that national solicitude aided and inspired by the most sacred domestic affection—all that the tender human feeling of all nations, and the chivalrous rivalry of the Old World and the New, could furnish of zeal, skill, courage, eager daring, and stern endurance, to the one great object of seeking out the lost, has been prodigally spent; and as if indeed it were the will of Heaven that in all calamity there should be a blessing, we have seen not only our kinsmen beyond the Atlantic, but France and Russia, lending no sterile sympathy to our great bereavement. Whenever and wherever the story of Franklin and his comrades is told, the names of Bellot, of Kane, of Grinnell, will be remembered with the names of Rae and Richardson, of Ross, of Maclure, and M'Clintock. Dr. Rae heard from the Esquimaux that the English commander had died of hunger, and thirty of his men with him. It is too certain that all the survivors from the abandoned ships perished of sheer starvation, for there is nothing to show that they suffered any violence, or that the term of their sufferings was cut short by any human hand. What those sufferings must have been, and with what unquailing steadfastness endured, no man from those icy regions shall ever tell, for all lay wrapt in everlasting sleep, secure from harm, long months and years before the arm of their country could reach them, though again and again it was stretched almost within their grasp. But it was not to be. Nor was their work accomplished when their martyrdom was sealed. The example of their lives and deaths is precious to England, and to all humanity.

We have said that their work was accomplished. It is to Franklin and his comrades that we owe the discovery (by Maclure) of the North West Passage, and it is on Franklin's track that other and happier explorers have marched to the conquest of unpitying science. The voyage of the gallant little yacht *Fox* is not among the least glorious episodes of a sad and splendid story. Who can forget that it was the wife, now too surely the widow, of Franklin, whose commission the noble-hearted seaman bore who was destined to bring home the final message from the dead? Not only has "the feeling of entire devotion to the cause which Lady Franklin has so nobly sustained, and a firm

determination to do all that men could do," as Captain M'Clintock, with the frank simplicity and truthfulness of a seaman, declares, supported him and his companions through every difficulty, but it has enabled them, in detached parties, by sledge journeys, to add to former discoveries "eight hundred miles of coast line," and thus, writes Capt. M'Clintock, "to unite the explorations of the former searching expeditions to the North and West of our position with those of James Ross, Dease, and Rae to the South." Neither fog, nor gale, nor wasting sickness, nor long privation, nor severe suffering, nor imminent peril, could for a moment daunt or weaken the "enthusiastic spirit" and the "cheerful obedience" of these last of the Arctic discoverers.

To the foregoing interesting narrative we must add the following faithful copies of the contents of the two papers abovementioned.

H.M.S. *Erebus and Terror.*

May, 1847 { Wintered in the ice in Lat. 70° 5′, Long. 98°.

Having wintered in 1846-7 at Beechey Island in lat. 74° 43′ 28″ N., long. 91° 39′ W., after ascending Wellington Channel to lat. 77°, and returning by the West side of Cornwallis Island.

Sir John Franklin commanding the expedition.

June 2nd all well.

Left the ships Monday 24th May, '47, the party consisting of two officers and six men.

Same. GM. GORE, *Lt.*, and A. F. de VOEUX, *Mate.*

April, 1848, H.M.S. *Terror* and *Erebus*, on the 22nd of April 5 leagues N.N.W. of this were beset since 12th Sept. 1846. The officers and crews consisting of 105 souls, under the command of Captain F. R. M. Crozier, landed here in lat. 69° 37′ 42″, long. 98° 41′ W. This paper was found by Lieut. Irving* under the cairn supposed to have been built by Sir James Ross in 1831, 4 miles to the northward, where it had been deposited by the late Commander Gore in May 1847. Sir James Ross's pillar has not however been found, and the paper has been transferred to this position which is that in which Sir James Ross's pillar was erected. Sir John Franklin died on the 11th June, 1847, and the total loss by deaths in the expedition has been to this date 9 officers and 15 men.

F. R. M. Crozier, Captain and Senior Officer starts to-morrow 26th for Back's Fish River, and James Fitz James, Captain H.M.S. *Erebus.*

[A chart of these parts will be found in our volume for 1856.]

* He was the junior lieutenant of the *Terror* when the expedition left England in 1845.

Navigation of the Pacific Ocean.

(Continued from page 467.)

Navigation of Torres Strait.—Route from India to the East Coast of Australia.—The navigation of Torres Strait, one of those which connect the Indian with the Great Ocean, has for some years acquired great importance, and the number of vessels which take this route increases annually. It will be useful, therefore, to collect and combine all the instructions given for this navigation in the *Nautical Magazine* in such a manner as to tell seamen as completely as possible what to do in this strait. The following appears in the directions of Captains P. King, Blackwood, and Yule, who have made charts of these dangerous latitudes. As already said in the Indian routes, Torres Strait may be often taken with advantage. It was long thought that during the N.W. monsoon it was impossible to pass through this strait, but the surveys of Captain Blackwood have shown that this was erroneous.

Passing from the Indian into the Pacific Ocean by Torres Strait, a ship arrived off Cape York can take either of two routes for ports on the eastern coast of Australia. By the first, called the "Inner Route," the coast is followed from Cape York to the rock called Breaksea Spit, which stretches to the northward from Sandy Cape. The second, the "Outer Route," commences from the Barrier Reefs North of Darnley Island by Bligh Passage or by those North and South of Raine Island. By a vessel outside of the Barrier Reefs the route in a former page may be taken in reverse: that is, passing East of the Diana Bank, between Albert Reef, left to the West, and the Mellish Bank, left to the East, a course is steered so as to pass East of Kenn Reef, Wreck Reef, and the Cato Bank, to the parallel of Sandy Cape, South of which the sea is free from all danger.

Ships bound to India from a port on the East coast of Australia by Torres Strait take either the inner route up to Cape York, or the outer route for Bligh Channel or those of Raine Island. Opinions differ on the advantages of these two routes in respect to the time of passage. The outer route may be preferable, but, under all circumstance, the inner route is generally considered as the safest, and is particularly recommended by the late Admiral P. P. King, who surveyed it. Captain Blackwood, who surveyed the outer edge of the Barrier, says regarding it:—

"It appears to me that the Inner Route of Admiral King ought always to be taken by a steamer, because the time lost in anchoring the first five or six nights will be amply made up for by the rapid passage that she will make in the day in calm waters of this sheltered route. The distance from Cape York to Sydney being only 2,000 miles, a steamer would probably make it in fifteen days, even allowing for foul winds near Sydney during the winter.

"With a sailing vessel from the westward I should recommend leaving Torres Strait by Bligh Passage, North of Darnley Island,

that has been recently explored by the *Fly* and the *Bramble*. It has the advantage of offering everywhere sufficient depth for anchoring, and there are no coral banks under water.

"I do not think that when the usual precautions in this kind of navigation are adopted any accident can be met in taking the Raine Island Passages, especially if the new charts made by the *Fly* and the *Bramble* are on board (No. 1749). This passage has the inconvenience of bad anchoring ground in the space between Bird and Raine Islands; nevertheless, it is the shortest route with regard to distance."

Opinions are still more divided on the question of which is the best route to take for Torres Strait from East, that is from the Pacific to the Indian Ocean, or from Sydney to India. But there can be no doubt, if a rapid passage is to be made, that in the height of the S.E. monsoon (from May to September), the passage by Raine Island or by Bligh Channel, North of Darnley Island, cannot be accomplished in half the time required for the same purpose by the inner route. But yet the first routes are those generally taken by trading vessels.

A steamer will have the great advantage of being able to take the inner route for Torres Strait during the westerly monsoon (November to March), a time when it is scarcely practicable for sailing vessels, and I think in all cases the best for a steamer to take is the inner route, because she can find wood all along the Australian coast. There does not seem to be any reason for the passage from Sydney to Singapore occupying more than five weeks, for certainly the S.E. Trade will be found as far as 14° or 15° S. lat.; where westerly winds will then be found.

The following remarks of Captain Blackwood will be useful, as presenting a general view of the navigation of Torres Strait:—

Torres Strait is generally more frequented by vessels passing from East to West than by those from West to East. For some years past, however, many commanders have taken this route, at the risk of delay on the passage. Thus, we may observe, the westerly monsoon, which prevails in the seas of the Indian Archipelago from November to March, inclusive, is not regular in Torres Strait. It is only found there occasionally, in intervals lasting from eight to ten days, about the changes of the moon. In some rare cases these westerly winds are tolerably strong, though they are generally variable, and only appear to be interruptions of the S.E. Trade winds. These breezes should be met with in November and in the following months as far as March, and sometimes even, but seldom, in April. For steamers, however, the wind is of little consequence, and in Torres Strait it is seldom strong enough to delay them.

On the N.E. coast of Australia and in the neighbouring sea the easterly Trade wind prevails nearly all the year. From May to September it is mostly from between E.S.E. and S.S.E., both strong and regular. During the rest of the year it becomes moderate and more northerly, sometimes from E.N.E. and N.E. In January, February, and March, at the changes of the moon, the gusts from N.W. are of short duration, as before said. Sometimes there are strong breezes at

this time, although generally these winds are moderate and bring fine clear weather.

On the eastern coast of Australia, between Moreton Bay and Sydney, westerly winds prevail from May to September, the winter time of the southern hemisphere. The wind is often strong in this season, but as it is off the land the sea is smooth and navigation is easy. In the summer months the wind is generally from the eastward, assuming almost the character of a Trade wind.

The currents of this coast are much influenced by the Trade winds. The current coming from the eastward is divided at Breaksea Spit. One part of it flows N.W. towards Torres Strait, and the other turns South along the coast until it reaches Cape Howe, where it joins the body of water coming from Bass Strait, driven there by westerly winds, and then the whole of it flows eastward towards the South coast of New Zealand.

Routes from India to Torres Strait.—A ship from Madras or Calcutta intending to take Torres Strait, having crossed the gulf of Bengal, would stand along the West coast of Sumatra; and then steer for Torres Strait, passing South of the Sunda Islands. If she is from Singapore or China she will probably find Allas Strait the best route for passing South of the Sunda Islands to Torres Strait, for at two miles from the coast of Lombock there are good anchorages (that of Peejou, among others) on the western side of that strait. On leaving Allas Strait she would steer so as to pass South of Sandal-wood and Rottie Islands, keeping at a good distance from the latter in order to avoid the Sahul Bank, some parts of which are dangerous. Rottie Strait is safe, although Captain Law has mentioned a danger there that should be avoided by keeping on the North side of the strait. From the South point of Rottie she may run direct for Wallis Islands, at the West entrance of Endeavour Strait, taking care to avoid several coral banks mentioned by Captain Flinders, and since examined by Captain Blackwood.

Captain Mackenzie, on the contrary, says that vessels leaving India or China for Torres Strait would do well to take the Java Sea, and make their way North of the Sunda Islands out of it, between Ombay and Pulo Cambing. During the two monsoons, he says, the water is smooth in the Java Sea and among the Moluccas, compared with that which is found South of the Sunda Islands and in the Sea of Timor, on account of the swell from S.W. always prevailing and very trying. Besides, sailing vessels by keeping in the Java Sea will have the advantage of the land breeze off the North coast of the Sunda Islands. On leaving Ombay they should steer directly for Torres Strait.

Again, vessels from India should take the strait of Malacca for Singapore, and from thence the Java Sea. Crossing this sea, they should leave it by Ombay Strait, or by passing between Timor and Wetta, for the Timor Sea to Torres Strait. This is a route especially advantageous for steam-vessels.

Steam Routes from Singapore to Sydney.—This opinion of Captain Mackenzie is confirmed by the following directions (from the *Nautical*

Magazine), which complete what we have already said about the navigation of the Java Sea. To proceed from Singapore to Sydney by the Java Sea and Torres Strait either one of two routes may be adopted, known by the names of the South and North Routes. With the exception of the strait between Salayer and Celebes, in the northern route, and the passages between the islands East of Madura (Pondy, Galion, Hog, Kangelang, and Urk), in the southern route, the channels in either of them are not so narrow as to render navigation dangerous by day or night. Besides, by leaving Singapore early a vessel would reach the strait of Salayer by daylight. But the best time for leaving Singapore is at eight in the evening, and, having cleared the harbour, an E.b.N. course for Pedra Blanca should be steered.

Pedra Blanca (thirty-two miles from Singapore) is an isolated rock, about twenty feet high, near the middle of the eastern entrance of Malacca Strait. The principal channel, situated North of this rock, is four miles wide in the narrowest part.

A lighthouse, named after Horsburgh, the tower of which is stone and seventy feet high, is established on Pedra Blanca. The light revolves once a minute, and is visible from the deck of a vessel distant fifteen miles.

From Pedra Blanca the course is nearly S.E.b.E. for about 315 miles, to the Carimata Group; in which distance the depths vary from twenty to twenty-five fathoms, with a muddy bottom.

Carimata Passage.—The Carimata Group (347 miles from Singapore) are in the entrance of the channel formed by Borneo and Billiton, and generally known as the Carimata Passage. The track most frequented in adopting this passage is that which leads South of Souroutoie, the channel between this island and Ontario Reef, being little less than twenty miles across. When Carimata Peak bears about N.N.W. a S.S.E. course (keeping the peak still N.N.W.) leads nearly in the middle of the channel, between the Mancap Rocks, which extend beyond the S.W. point of Borneo, the reefs which line the eastern side of the strait, and those which bound the western. The depth of water in this track is over eighty feet, with a muddy bottom. In clear weather the East island of the Montaran Group is visible, and as the peak of Carimata is also within view a vessel can always determine her position.

Having crossed the Carimata Passage, there are two routes for proceeding eastward, which join at Pulo Cambing, an island on the North coast of Timor. According to the season, each of these have their advantages.

The Southern Route during the East Monsoon.—During the easterly monsoon (from April to September, inclusive), the southern route along the North part of the islands East of Java ought to be taken by steamers. At this time, when Bally is passed, a current will be found setting eastward at the rate of a mile to a mile and a half an hour.

The Northern Route during the West Monsoon.—The northern route by Salayer Strait has the advantage of being a little shorter

(about thirty miles), besides during the westerly monsoon, which lasts from October to March, squalls of wind and heavy rain are met near the islands East of Java, whilst more northerly the weather is comparatively fine. The northern route then is preferable at this period, and should be taken by a steamer whether bound East or West.

Southern Route in the Java Sea.—Having cleared the Carimata Passage, if the southern route is adopted a course for Bavian Island or Lubeck should be shaped. Then, should Bavian Island be gained during the night, the ship should steer for Pondy (an island a little East of Madura), so that by daybreak she may pass between this island and that of Gilion or Galion. But if Bavian be reached before night, the best course to take is for the N.W. point of Kangelang, so as to stand on without fear during the night, and then take the passage formed by this island and that of Urk. These two passages are well known and much frequented. The passage between Pondy and Galion Islands is generally taken by vessels which enter the Java Sea by Bally Strait, in going to Singapore or China. It is also taken by Dutch vessels taking coffee to Banyn Wange before returning to Europe.

(To be continued.)

Nautical Notices.

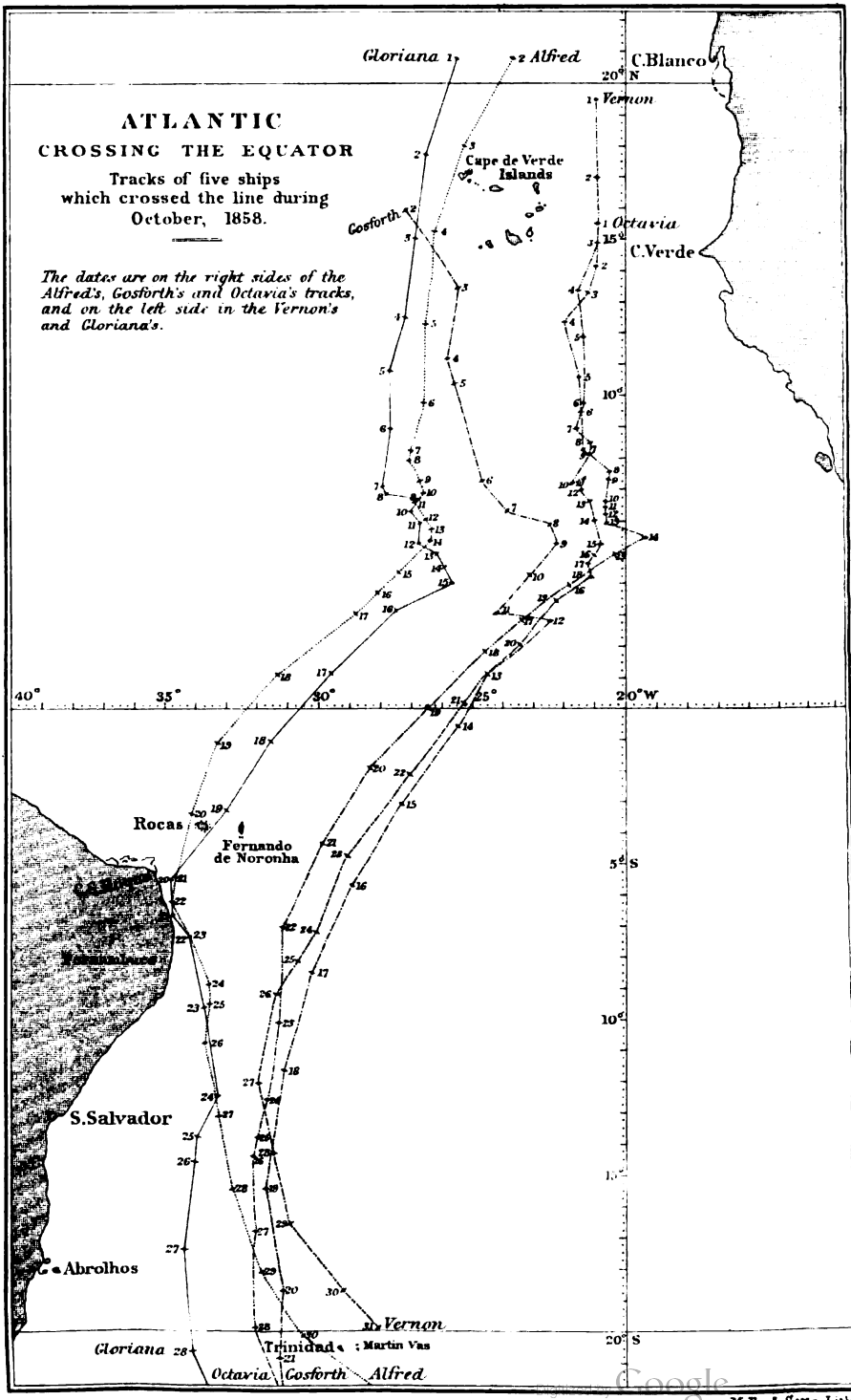
Particulars of Lights Recently Established.

(Continued from page 440.)

	Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.,
25	United States Lights	.....	.....	..	..	..	Discontinued. See page 440.
26	Brahe	Head of Harboar	Alderney	F. F.	25 55	8	Est. 1st Aug., '59. Lead in when in one. *Red.*
27.	Kill Point	Coast of Anatolia, 41° 10′ N., 29° 38′ E.	Black Sea	R.	221	25	Est. 8th Aug., '59. Once in a minute.
28.	Isle Tapia	43° 35·6′ N., 6° 58·4′ W.	Bay of Biscay	Ffl.	93	15	Est. 1st Sept., '59.
29.	Maranham	St. Antonio Point	Brazil	..	..	..	Not to be depended on. Is now in ruins.
30.	Ostra Finngrundit	60° 55·5′ N., 18° 26′ E.	Gulf of Bothnia	F.	..	10	Est. 25th July, '59.
	Holevarde Light	Norway, W. coast	Karno Sound	F.	..	..	Relighted 1st Sept., '59.
	Katherimenthal	.....	Revel Road	..	..	..	Re-established 27th July, '59.
31.	Shambles	East end of shoal	English Channel	F.	38	..	Est. Sept., '59.
32.	Cape Scaramia	36° 40·2′ N., 14° 30·3′ E.	Sicily, South coast	F.	123	18	Est. 1st Oct., '59.

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

[The pressure on our pages from the recent Chinese and Arctic matters has compelled us to reserve much of our usual matter, to be made up hereafter.]



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THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

NOVEMBER, 1859.

On the Westerly Route for Crossing the Line,—*By Captain H. Toynbee, F.R.A.S. With a Chart.*

In my paper "On the Westerly Route for Crossing the Line," published in the *Nautical Magazine* for April, 1859, I promised to make further researches respecting the routes of other ships which crossed about the same time in October, 1858. This I have now done, and send you a chart of their tracks. The name of each ship is written at the commencement and end of her track; they were all seen by the *Gloriana* in or about the English Channel when starting, and probably there is not much difference in their sailing qualities.

The first question raised is,—was the *Gloriana* right in steering due South on the 2nd when the wind was fair? The *Gosforth's* track says no, she ought to have steered S.S.E. until in 25° W., and then to have made a little easting with the southing whenever it was possible. But the tracks of the two ships (*Vernon* and *Octavia*) which passed East of the Cape de Verde Islands say on no account go to the eastward of 22° W. This advice is only applicable when the wind is light and variable; of course if a S.W. monsoon is experienced in these parts a south-easterly course must be followed until the wind draws to the South.

On looking at these tracks I suppose Maury's correspondent Captain Windsor would say that the captain of the *Gosforth* is "one of those men who are kicked through the world in good luck to keep them out of harm's way," or how could he have had a run of 184 miles between the 5th and 6th of October, when ships to the right

and left of him did but little more than half that distance in the same time. Not being a believer in luck myself, it seems to me that the little easting he made from the 2nd to the 9th placed him in a position by which he was enabled to keep off the coast of South America, and so avoid the light winds from the 24th to the 26th which affected all the ships North of 20° S. Here my *second query* is answered, for we find that the westerly crossing of the line was not the cause of the light winds we experienced on the 25th and 26th; or, to be more explicit, the ships several degrees East of us suffered from them to the same extent as ourselves.

The *Alfred* and *Gloriana* have given the extreme westerly route a fair trial. They started from 20° N., differing one day in their dates, and on the 23rd of October, after passing Cape St. Roque, the *Alfred* was in the same position as the *Gloriana* had held on the 22nd.

The extreme eastern route between the Cape de Verde Islands and Africa was fairly tried by the *Vernon* and *Octavia*. It is manifestly wrong for the early part of October, for they lost much on the ships which took the western route.

Considering the positions of the four hindmost ships on the 28th of October, I am inclined to think that the *Gloriana's* is the best, for to get South of the calms and variables near the tropic of Capricorn is more important than to make easting, so much so that when there I choose the tack which gives the most southing. Hence the readers of my last paper on the subject will see that this research proves that we were better off than most of our neighbours, and no doubt the commanders of the other ships will examine this chart with great interest.

It will be noticed that the *Gosforth's* track ends on the 21st, so that although, where it commenced, she was but a trifle more than half a day in advance of the *Gloriana*, she ended with an advance of seven days. Thus she gained on the *Gloriana*, 6½ days; *Alfred*, 7¼; *Octavia*, 8½; *Vernon*, 9½.

The conclusion I draw from this is that early in October neither the extreme eastern nor the extreme western route is good. Therefore a ship should pass West of the Cape de Verde Islands, and then, when the wind will permit, haul to the S.E. when South of them, so as to be in about 23° W. when she is in 5° N., she should then take the tack which gives the most southing.

Maury's *Sailing Directions* support this opinion. The averages he deduces from the table in page 148 of the 2nd vol., dated March, 1859, plainly prove that the extreme western route is a disadvantage in October. And, again, the American part of the table in page 369 shows that ships should not go East of the Cape de Verde Islands in October, though it is contradicted by the Dutch part of the same table, with more ships to take an average from. Still, most of the nine Dutch ships may have passed East of the Cape de Verdes much later in October than the Americans; at any rate sound reason seems to support the middle route, for if a ship works her way to the South in the longitude of the Cape de Verdes she is more likely to get a

spirt of the S.W. monsoon, which sometimes blows at this season, and avoids the certain calms of a more easterly course, as also the danger of being detained a day or two near Cape St. Roque by the more westerly route.

From the end of October to February I would pass East of the Cape de Verde Islands, and perhaps also in March and April. Early in December we took this route and were on the equator on the 23rd day from England.

A few tracks similar to these for each month in the year would soon decide the best route. They might then be collected in a small pamphlet, which would be valuable to navigators.

The object of the above paper being the advancement of nautical knowledge, I make no apology for adding the following valuable suggestion, on which my opinion was asked by J. Herbert, Esq., of the Trinity House, London. He proposes (and I most heartily support his idea) that there should be a kind of circulating library of charts established; to which a trifle should be paid each voyage, or annually, by subscribers; for which sum the charts of each ship should be received there on her return to England, so that every new or doubtful danger, or light, or dangerous wreck should be entered upon them,—in fact all the information which the newest charts possess.

This seems to he worthy of every encouragement, and a subject in which our Government and especially our insurance offices should take deep interest. Knowing, as every sailor must do, the value of such a suggestion, I take this opportunity of thanking Mr. Herbert for it, and trust it will lead to an establishment of the kind either national or private.

The advantage of the plan would be greatest to the commanders of small ships, who go on wandering voyages to all parts of the world, and who cannot be expected to spend £3 or £4 a year in purchasing every new edition of each chart as it comes out.

The safety of ships would be improved if the provision of charts were taken up by the owners instead of the commanders, for they are quite as important as chronometers and compasses.

JAPAN.

The following interesting remarks on the condition and prospects of Japan are contained in a letter from Nagasaki by an American physician on a mission at Shanghae, and addressed to a gentleman in London:—

You are aware that the new treaties opening this port to the com-

merce of the United States and England do not go into effect until July next, nevertheless there is now here a large mercantile fleet from our respective countries, unloading and loading, buying a little and selling less, broadly hinting to the Japanese their readiness of doing more. The traffic of the place, and it has not been small, is carried on, the American portion under the Dutch double treaty of 1856 and 1859, in virtue of the favoured national proviso in Perry's treaty; the English trade seems to rest on courtesy, your existing treaty being one of self-abnegation albeit, and Japanese are strict constructionists. They are disinclined to imitate the slipshod manner of the Chinese in dealing with foreigners. An example of this was afforded a few days ago, in the prompt expulsion from the harbour of a Danish vessel, on the ground that Denmark has no treaty with Japan. No privileges will be allowed to those to whom they have not been conceded by treaty. If the Chinese had been equally tenacious they would have saved themselves a world of trouble. It augurs well for the stability of foreign intercourse that the Japanese will tolerate the presence of no irresponsible person. If they insist on having proper consuls from every trading power, it will be better for all parties.

The passing away of the old system and the inauguration of a new era, for which there has been little or no preparation, induces confusion. Foreigners are allowed to make purchases in the city, but only with government notes, procured at a treasury bureau for Mexican dollars, the only foreign coin brought here. Commerce is subject to an intervention of the treasury department of government yet more directly in general mercantile transactions, a hindrance which will continue four months; until then it will be difficult to make reliable estimates on the business prospects of the place. In the palmy days of exclusion and monopoly trade suffered no ups and downs, dearth and glut were unknown. Now we have changed all that, and Japanese merchants, a degraded and therefore unenlightened class, are at their wit's end, and beyond. There are many things that puzzle them, the commodity sapanwood for example. The amount allowed to be imported and the price of the article were fixed, paying the comfortable profit to Mynheer of twelve hundred per cent. You anticipate the result. As soon as Dutch merchants were allowed to come freely to Desima, they favoured the Japanese with any amount of sapanwood, and the merchants of Shanghae being equally accommodating, there is a fair prospect, with what is coming from Siam and elsewhere, that it will become the cheapest wood in the place; as it is, Japanese merchants are afraid to touch it. Articles of export have hitherto found their way to Nagasaki in quantities sufficient to load two vessels for Batavia annually. Now, there are more than that number of arrivals in a week; and accordingly there is a corresponding demand for Japanese products, which are rising in price almost in the same ratio as the fall in imports.

Then, again, before the intermeddling of Perry and Harris, neither Japanese nor Dutchmen were ever guilty of haste, but busybodies who are turning the world upside down have come hither also, and

are in such a hurry as to perplex the mind of official commerce, to which such language as lay-days, demurrage, and the like, are outlandish jargon. Unamiable feelings are in the ascendant, vented by merchants in words, by their *employés* otherwise. Coolies and boats are not at hand, or not in sufficient numbers for loading and unloading, or when they come they must be driven and closely watched, celerity on one side and slowness on the other beget mutual disgust—the fast men as usual being losers. Nor does commerce glide smoothly when at last in motion, striking evidence of which is seen daily at Desima and on shipboard. The coolies and boatmen are incorrigible thieves and, though expert in the extreme, are often detected; then comes the cat or the cane, which, however faithfully applied, fails to deter from a repetition of the offence. Their double-sworded overseers, who are always in attendance, neither try to stop pilfering nor to stay the hands of enraged clerks and mates. A skipper has just sent word to the authorities that he would like to try the effect of a coating of tar to the head of offenders as a punishment, and permission, it is said, has been obtained; but certes, if they are the thieves they are represented to be, they will steal for the sake of the tar. Some natives put even their necks in jeopardy for a trifling consideration. The acquisition of gain by illegal means seems to possess a peculiar charm. Smuggling, an offence allied to theft, but to which all men are prone, is well understood at Nagasaki. We find ourselves tempted with Kobangs, a gold coin, the exportation of which is prohibited; with what success you may infer from its relative price to silver, which is 1 to 5½. Stealing and smuggling are facilitated by the large sleeves and loose robes of the inhabitants.

Apart from an extension of the former trade of Nagasaki direct to Europe, and an increase owing to its proximity to Shanghae, from which it is distant only three days' easy steaming, the port is likely to derive a large accession of business from the whale fishery and coal mines.

As a harbour for our whalers Nagasaki presents many advantages over every other port in the North Pacific Ocean. Hakodadi has been thought the most convenient place for hybernating and refitting, but they will soon discover that the mildness of winters here, the facility of sending their oil home by vessels from Shanghae, the appliances for repairs, and the cheapness of provisions render this a remarkably convenient harbour. The only thing wanting is potatoes, but as the Dutch, with the exception of this year, have succeeded in raising this all-important anti-scorbutic, it is not likely that it will long be among the wants of the port. Labourers receive about eight cents per diem. The inutility of the Bonin Islands will also contribute to the growth of this port. Intelligence from Port Lloyd represents the entrance of that harbour to be obstructed from an upheaval in a recent earthquake. Those islands were discovered and occupied by the Japanese long ago, and relinquished chiefly on account of the frequent and dangerous character of the earthquakes. In Japanese maps, that group is still included among their islands.

The natives are amused at hearing that your countrymen and mine have had words touching priority of discovery.

Nagasaki seems destined to derive a large accession of trade from neighbouring coal deposits, which are numerous and perhaps extensive. I visited an island to the northward, on account of which the Prince of Fizen sent a reprimand, where several mines are in operation. In fair weather a ship can anchor so near the mouth of the shafts as to receive coal almost directly into the hold. At one place the shaft is submarine, being carried above two hundred feet beneath the ocean. At present the sale to foreigners is restricted to small quantities, at from four to nine dollars per ton. It is for the most part of an inferior quality, abounding in sulphur, and leaving a large residuum of soot, ashes, and clinker. Scientific mining would doubtless be more satisfactory. The Japanese government now possess five steamers navigated wholly without foreign aid. The extent of the coal deposits of Japan is a question of interest, from the fact that the coal region in Sagalian lies within the new boundary line of Russia.

Vegetable wax, an article hitherto little known to commerce, is becoming an important export. It can be produced almost to any extent, but as I think I shall be able to introduce it into the United States, it may not long be in such demand here as it is at present.

The proximity of this part to Shangai promises to render it the chief seat of Japanese foreign commerce, while, on the other hand, it will contribute, with other Japanese ports, with the consular cities on the Yang-tze and the ports in the gulf of Chihli, to the aggrandisement of Shanghai, your principal mart, where are obtained large fortunes and big spleens.

One addicted to fine writing could desire no better subject than the scenery of Nagasaki; but you know I have no turn that way. It is enough for me to state that this city holds out special inducements to the foreign denizens of Shanghai as a sanatarium, particularly during the summer months. Its exemption from miasmatic diseases will render the change from any of the alluvial districts of China to this very beneficial. Native physicians, however, assure me that consumption is rife, yet that it is matter of no concernment to foreign visitors, nor even the epidemics that sometimes sweep over the islands, save when these are attributed to intercourse with us, when one may expect to be stoned. Some English naval officers were lately stoned, in the streets of Nagasaki, on account of the cholera. Japan enjoys the advantages of insular climates; the temperature is more equable than in the same latitudes on the continent. The Kuro-siwo, or warm stream, which laves the eastern shores, is to Japan, in a modified manner, what the Gulf Stream is to England—a warming apparatus, softening the rigour of winter. On crossing the Eastern Sea from Shanghai I made hourly thermometrical observations of the sea, and fancied that I discovered evidence of a bifurcation of the Kuro-siwo. It seems to be deflected at the southern point of Kiuchiu, sending up the West coast a small portion of its tepid water.

A residence of five weeks is an imperfect qualification for descanting

on the character of the people around me, yet there are some features visible at a glance, from which one cannot refrain drawing inferences. Crimes against property are not frequent, being repressed evidently by a strong and almost omniscient government, yet street broils are of common occurrence. The people seem well to do and contented, yet mendicity and drunkenness are far from being rare. Woman appears to hold a higher rank in this than in any Asiatic country, yet prostitution is fostered by government and approved by moralists. Public promiscuous bathing of both sexes is not the most striking evidence of a corrupt state of morals. Municipal brothels, called "tea houses" by foreigners, and obscene pictorial books, exhibit the national character in a revolting light. The notoriously voluptuous Chinese are fastidiously decorous compared with these islanders.

Foreigners hitherto have not been, and are not now, in a position to study aright the polity of this remarkable people. We have glimpses only of this complicated machinery of government, which is a model despotism. There has been effected here what priestcraft and kingcraft so nearly attained with us; and, by a singular coincidence, at the time when Western Europe was in course of emancipation, Eastern Asia was being brought into a servitude not less efficient than that which menaced our fathers. Espionage accomplishes what the confessional aims at. Yet the system of espionage, an abomination to foreigners, loses much of its repulsiveness when viewed from a Chinese stand-point. It is only carrying to an extreme the justly lauded censorate of China. Espionage performs the functions of a press. It exercises a wholesome restraint upon delegated powers, sitting lightly upon intelligent and upright officers, who regard these spies with no more disfavour than our treasurers their auditors. How much misery would be averted from China if the imperial government were cognisant of official misdemeanours in the provinces. Nearly all the maladies of that empire may be ascribed to the ignorance in which the sovereign is kept of what transpires beyond the precinct of the palace. Japan, it must be confessed, offers the best apology for despotism that the world affords. The government is omniscient, and consequently strong and stable. The bondage is absolute, pressing on all sides alike; society is scarcely conscious of its existence.

It is natural to draw comparisons between the Japanese and their continental neighbours. With some points of resemblance they present marked ethnic differences. The former are impulsive the latter meditative. The most prominent, however, are the imitativeness of the one contrasted with the conceitedness of the other. Hopes of improvement may be based on this trait of character in the Japanese. It is leading enlightened men among them to favour the introduction of arts and sciences from abroad. They have the sagacity to perceive the advantages likely to accrue from this policy. Japan may now be considered as having entered on a career of improvement, while China remains stagnant or retrograding. If I might be allowed to speculate on the future of the two countries, I should say that this seems destined quickly to attain a degree of civil-

ization immeasurably beyond China, while China, however long she may lie dormant, will, on the application of an appropriate moral stimulant, advance slowly to a point which this race may never hope to reach. Japan is wanting in originality; she has produced no great thinker. Her sages as well as her literature are Chinese, the most important works appearing in that language, which is the more remarkable, as for copiousness and polish the Japanese excels that of any in Eastern Asia. The religious system of Sakymuni has nearly supplanted the ancient nature worship, and Confucian philosophy has dwarfed the national mind. Unless greatly modified by the Christian element we may fix with considerable precision her future standing among nations. The Chinese race, on the contrary, possess within themselves all the elements of greatness and illimitable improvement.

Men of progress have here, as elsewhere, to contend against an inertia that claims to be called conservative. The conservatives of Japan are bigotedly orthodox, and set their faces as a flint against foreign intercourse. Should the contemplated embassy to the United States take place, it will prove the commencement of a silent revolution which will assimilate Oriental to Occidental manners to an extent unparalleled in history. It is rumoured that those who are opposed to the embassy are now in the ascendant at the metropolis as well as at the capital; if so, it may be delayed, but not long. The desire of going abroad is too strong and too widespread to be permanently restrained. The travelled Japanese is sure to be a reformer; he will be foremost in conforming to western civilisation. There is already a disposition in the country to adopt the costume and manners of Europeans. To some extent this has become a necessary consequence of other improvements. Shoes must be substituted for sandals in the army and navy, where it will be found necessary to make many innovations in dress. It is stated that all the crew on board the steamer which your government presented to this, are clad as Englishmen. Their linguistic abilities are a good augury. Unlike the Chinese, they quickly acquire foreign languages. Mark the following instance of painstaking. The *English Spraakunst*, published a few years ago in Amsterdam to aid Dutchmen in studying English, has just been republished here in a legible running hand; the English or italicised portion with a backslope, and printed on wooden blocks. All this was done to aid the few who speak Dutch to acquire our language.

A work is now in progress in this city eminently calculated to fit Japan for that position to which she aspires. There is here a body of officers and men, forty-three in all, a detachment of the Dutch navy, who are imparting instruction in naval and military tactics, navigation, mathematics, naval architecture, gunnery, political economy, the medical sciences, and the Dutch language. Graduates of this school have already become teachers, being engaged in drilling several regiments at Jeddo. Dutch engineers are erecting a large machine shop for a steam hammer, and all the appliances needed for keeping the steam navy in repair. A steam engine is already at work moving lathes, at which apprentices, sons of men of rank, are turning, whilst

others are moulding, forging, or filing. The greatest curiosity in this foundry is a small steamer built entirely, the native engineer says, from drawings that he met with in an old Dutch work. Dutch engineers are correcting some slight defects of the engine which prevented rapid propulsion. I think that the ingenious mechanic must have seen the *Mississippi* or *Susquehanna*.

The military and medical classes of Japan will be her chief innovators. Already are our systems of medicine and surgery in practice to a large extent throughout the empire. The tenacious adherence of the conservatives to the hierarchy will lead liberal princes to favour new doctrines, if it were only as an offset to the obstructives.

The party favourable to foreign intercourse is strengthened by the general persuasion that the concessions made were inevitable, and it is weakened by apprehensions that opium and Christianity will thereby effect entrance. They would fain have placed both in the same prohibitory clause. Thanks to Townsend Harris, distinction has been made, and a degree of toleration secured, which, if discreetly availed of, will accomplish what remains to be done for religious liberty. It is impossible to treat of Japan without discussing those two subjects.

The interdiction of opium in the treaties lately negociated in itself avails nothing. I suppose they know this well enough. They have just seen the Americans in renewing their treaty with China embrace the opportunity of China's embarrassments to drop the prohibition of the drug; and of course in the hour of Japan's extremity, her interdiction will in like manner be set aside. If the Japanese would avert the impending evil, they must no more rely upon the good faith and benevolence of states than on the conscientiousness of individuals. Their safety consists in trusting to their own energy and vigilance. These will be sorely taxed. Opium, as prepared in China for the California market, from the small space that it occupies can be easily smuggled. A limited quantity is now legally imported for the use of the members of the Chinese factory, a numerous body of opium-smokers. Your treaty will open this port to Anglo-Chinese, who possess peculiar facilities for rendering opium prohibition nugatory. Chinamen, moreover, will be the agents of temptation, seducing these sensual and not unwilling people. A case has just come to my knowledge indicative of the course which is likely to be pursued by many. A Chinaman took some opium and a pipe from his sleeve, which, after using, he presented to a Japanese friend, who whiffed and lauded the fascinating narcotic. If the arm of government should ever be paralysed by foreign war or civil discord, then will opium come in like a flood.

British Trade with Japan.

The following regulations under which British trade is to be conducted in Japan are from the *China Mail*:—

Regulation I.—Within forty-eight hours (Sundays excepted) after the arrival of a British ship in a Japanese port, the captain or commander shall exhibit to the Japanese custom-house authorities the receipt of the British Consul, showing that he has deposited all the ship's papers, the ship's bills of lading, &c., at the British Consulate, and he shall then make an entry of his ship, by giving a written paper, stating the name of the ship, and the name of the port from which she comes, her tonnage, the name of her captain or commander, the names of her passengers (if any), and the number of her crew, which paper shall be certified by the captain or commander to be a true statement, and shall be signed by him; he shall, at the same time, deposit a written manifest of his cargo, setting forth the marks and numbers of the packages and their contents, as they are described in his bills of lading, with the names of the person or persons to whom they are consigned. A list of the stores of the ship shall be added to the manifest. The captain or commander shall certify the manifest to be a true account of all the cargo and stores on board the ship, and shall sign his name to the same.

If any error is discovered in the manifest, it may be corrected within twenty-four hours (Sundays excepted) without the payment of any fee, but for any alteration or post-entry to the manifest made after that time a fee of fifteen dollars shall be paid.

All goods not entered on the manifest shall pay double duties on being landed.

Any captain or commander that shall neglect to enter his vessel at the Japanese custom-house within the time prescribed by this regulation, shall pay a penalty of sixty dollars for each day that he shall so neglect to enter his ship.

II.—The Japanese government shall have the right to place custom-house officers on board of any ship in their ports (men-of-war excepted); all custom-house officers shall be treated with civility, and such reasonable accommodation shall be allotted to them as the ship affords.

No goods shall be unladen from any ship between the hours of sunset and sunrise, except by special permission of the custom-house authorities; and the hatches and all other places of entrance into that part of the ship where the cargo is stowed, may be secured by Japanese officers, between the hours of sunset and sunrise, by fixing seals, locks, or other fastenings; and if any person shall, without due permission, open any entrance that has been so secured, or shall break or remove any seal, lock, or other fastening that has been affixed by the Japanese custom-house officers, every person so offending shall pay a fine of sixty dollars for each offence.

Any goods that shall be discharged, or attempted to be discharged, from any ship without having been duly entered at the Japanese custom-house as hereinafter provided, shall be liable to seizure and confiscation.

Packages of goods made up with an intent to defraud the revenue

of Japan, by concealing therein articles of value which are not set forth in the invoice, shall be forfeited.

If any British ship shall smuggle, or attempt to smuggle, goods in any of the non-opened harbours of Japan, all such goods shall be forfeited to the Japanese government, and the ship shall pay a fine of one thousand dollars for each offence.

Vessels needing repairs may land their cargoes for that purpose without payment of duty. All goods so landed shall remain in charge of the Japanese authorities, and all just charges for storage, labour, and supervision, shall be paid thereon. But if any portion of such cargo be sold, the regular duties shall be paid on the portion so disposed of.

Cargo may be transshipped to another vessel in the same harbour without payment of duty, but all transshipments shall be made under the supervision of Japanese officers, and after satisfactory proof has been given to the custom-house authorities of the *bonâ fide* nature of the transaction and also under a permit to be granted for that purpose by such authorities.

The importation of opium being prohibited, any British vessel coming to Japan for the purposes of trade, and having more than three catties' weight of opium on board, the surplus quantity may be seized and destroyed by the Japanese authorities; and any person or persons smuggling, or attempting to smuggle opium, shall be liable to pay a fine of fifteen dollars for each catty of opium so smuggled or attempted to be smuggled.

III.—The owner or consignee of any goods who desires to land them, shall make an entry of the same at the Japanese custom-house. The entry shall be in writing, and shall set forth the name of the person making the entry, and the name of the ship in which the goods were imported, and the marks, numbers and packages, and the contents thereof, with the value of each package extended separately in one amount, and at the bottom of the entry shall be placed the aggregate value of all the goods contained in the entry. On each entry, the owner or consignee shall certify in writing that the entry then presented exhibits the actual cost of the goods, and that nothing has been concealed whereby the customs of Japan would be defrauded, and the owner or consignee shall sign his name to such certificate.

The original invoice or invoices of the goods so entered shall be presented to the custom-house authorities, and shall remain in their possession until they have examined the goods contained in the entry.

The Japanese officers may examine any or all the packages so entered, and for this purpose may take them to the custom-house; but such examination shall be without expense to the importer or injury to the goods; and after examination the Japanese shall restore the goods to their original condition in the packages (so far as may be practicable), and such examination shall be made without any unreasonable delay.

If any owner or importer discovers that his goods have been damaged on the voyage of importation before such goods have been

delivered to him, he may notify the custom-house authorities of such damage, and he may have the damaged goods appraised by two or more competent and disinterested persons, who, on due examination, shall make a certificate setting forth the amount per cent. of damage on each separate package, describing it by its mark and number, which certificate shall be signed by the appraisers, in presence of the custom-house authorities, and the importer may attach the certificate to his entry, and make a corresponding deduction from it. But this shall not prevent the custom-house authorities from appraising the goods in the manner provided in Article 15 of the treaty to which these regulations are appended.

After the duties have been paid, the owner shall receive a permit, authorising the delivery to him of the goods, whether the same are at the custom-house or on shipboard.

All goods intended to be exported shall be entered at the Japanese custom-house before they are placed on shipboard. The entry shall be in writing, and shall state the name of the ship by which the goods are to be exported, with the marks and numbers of the packages, and the quantity, description, and value of their contents. The exporter shall certify, in writing, that the entry is a true account of all goods contained therein, and shall sign his name thereto.

Any goods that are put on board of a ship for exportation before they have been entered at the custom-house, and all packages which contain prohibited articles, shall be forfeited to the Japanese government.

No entry at the custom-house shall be required for supplies for the use of the ships, their crews, and passengers, nor for the clothing, &c., of passengers.

IV.—Ships wishing to clear shall give twenty-four hours' notice to the custom-house, and at the end of that time they shall be entitled to their clearance; but if it be refused, the custom-house authorities shall immediately inform the captain or consignee of the ship of the reasons why the clearance is refused; and they shall also give the same notice to the British Consul.

British ships of war shall not be required to enter or clear at the custom-house, nor shall they be visited by Japanese custom-house or police-officers.

Steamers conveying the mails of Great Britain may enter and clear on the same day, and they shall not be required to make a manifest, except for such passengers and goods as are to be landed in Japan. but such steamer shall, in all cases, enter and clear at the custom-house.

Whale ships touching for supplies, or ships in distress, shall not be required to make a manifest of their cargo; but if they subsequently wish to trade, they shall then deposit a manifest, as required in Regulation I.

The word "ship," wherever it occurs in these regulations, or in the treaty to which they are attached, is to be held as meaning ship, barque, brig, schooner, sloop, or steamer.

V.—Any person signing a false declaration or certificate with the intent to defraud the revenue of Japan, shall pay a fine of 125 dollars for each offence.

VI.—No tonnage duties shall be levied on British ships in the ports of Japan, but the following fees shall be paid to the Japanese custom-house authorities:—For the entry of a ship, fifteen dollars; for the clearance of a ship, seven dollars; for each permit, one dollar and a half; for each bill of health, one dollar and a half; for any other document, one dollar and a half.

VII.—Duties shall be paid to the Japanese government, on all goods landed in the country, according to the following tariff:—

Class 1.—All articles in this class shall be free of duty:—Gold and silver, coined or uncoined; wearing apparel, in actual use; household furniture and printed books, not intended for sale, but the property of persons who come to reside in Japan.

2.—A duty of five per cent. shall be paid on the following articles: All articles used for the purposes of building, rigging, repairing, or fitting out of ships; whaling gear of all kinds; salted provisions of all kinds, bread and bread-stuffs, living animals of all kinds, coals, timber for building houses, rice, paddy, steam machinery, zinc, lead, tin, raw silk, cotton and woollen manufactured goods.

3.—A duty of thirty-five per cent. shall be paid on all intoxicating liquors, whether prepared by distillation, fermentation, or in any other manner.

4.—All goods not included in any of the preceding classes shall pay a duty of twenty per cent.

All articles of Japanese production, which are exported as cargo, shall pay a duty of five per cent., with the exception of gold and silver coin, and copper in bars.

Rice and wheat, the produce of Japan, shall not be exported from Japan as cargo, but all British subjects resident in Japan, and British ships for their crews and passengers, shall be furnished with sufficient supplies of the same.

Foreign grain brought into any open port of Japan in a British ship, if no part thereof has been landed, may be re-exported without hindrance.

The Japanese government will sell, from time to time, at public auction, any surplus quantity of copper that may be produced.

Five years after the opening of Kanagawa, the import and export duties shall be subject to revision, if either the British or Japanese government desires it.

ELGIN AND KINCARDINE
MIDZUO TSIKFOGONO KAMI
NAGAI GEMBANO KAMI
INOUWYE SINANO NO KAMI
HORI ORIBENO KAMI
IWASE HIGONO KAMI
ISUDA HAUZABRO.

Ebn-Hani and the Island of Ruad.

Leaving the anchorage under Cape Posidium on the 25th June, we sounded towards Latakia; but finding that roadstead very exposed, we sought shelter to the North of Cape Khauziri, where we found excellent anchorage in the bight off the small village and monastery of Ebn-hani.

This I made our head-quarters whilst Lieutenant Brooker completed the coast line and survey towards Latakia. Mr. Gray, during our stay, made a survey of the anchorage on a larger scale than the general sheet.

Here the packets running between Alexandria and Smyrna would find excellent shelter and smooth water during the strong S.W. breezes, and could always land their mails, which could be conveyed by horse in one hour to Latakia; whereas now they frequently cannot communicate with Latakia, and are forced to run on to Alexandretta.

Here we remained till July 5th; when, having completed the soundings in the vicinity, I pushed on to the island of Ruad, leaving Lieutenant Brooker in the first whaler to run in the coast line. We anchored immediately to the eastward of the island, in four fathoms, sand.

Ruad, although but four-tenths of a mile in length, affords excellent shelter. During our stay it blew very hard from the S.W. on two or three occasions, but we lay perfectly smooth and quiet, and for a vessel of our size it is the most agreeable along the coast.

The island, a mere rock, scarcely 100 feet high, without a spring of fresh water, contains upwards of 1,500 inhabitants, whose principal occupation is trading along the coast in small schooners and sponge diving. Their only water is what is collected in the winter and rainy season and preserved in immense tanks. Every necessary of life has to be brought from the main land.

The island, which has been extensively quarried, is composed of a red sandstone. Two moles, formed of enormous stones, have been thrown out on the eastern side. These, with the S.E. cape, form two well sheltered coves, capable of holding all their small craft. The larger vessels ride out the winter anchored about a cable to the eastward.

An ancient wall, composed of blocks of sandstone—many measuring 15 feet long, 7 broad, and as many high, surrounding the island to prevent the encroachment of the sea, as well as for protection, still exists, but much has been thrown down during heavy gales,—that in 1840 was particularly destructive. To the North and West the wall was double, about fifty feet apart. A large fort, now dismantled and fast falling to decay, crowns the centre or highest part of the island, and a smaller one at each corner, besides one at the head of the centre mole. These were built about forty years ago to protect them from the attacks of the Greek corsairs.

The population are principally Mahometans.

Between Ruad and the main are three fresh water springs, bubbling up in the sea in four fathoms water. During calm weather the water is thrown up in jets above the sea surface. These are, in all probability, the springs mentioned by Strabo, from which the inhabitants during time of war drew their supplies by "letting down from a boat, which served for the purpose, and inverting over the spring (at the bottom of the sea) a wide mouthed funnel of lead, the end of which is contracted to a moderate sized opening; round this is fastened a long leathern pipe, which we may call the neck," and which receives the water forced up from the spring through the funnel.

Opposite, on the main land, are the extensive ruins of Antaridus, so well described by Pococke and Maundrell.

Extract of a Letter from an Officer.

Purification of the River Thames.

[On the subject of the purification of the River Thames by the main drainage scheme of the Metropolitan Board of Works we have received the following communication, which we consider to be well worthy of attention.—Ed.]

Sir,—If any object has engrossed a large share of public attention with but little beneficial result, it has been that of the purification of the River Thames. To this subject mine has been more particularly directed from observations during twenty-two years of the rivers in India, and the result of those observations has induced me to submit the following plan to the Metropolitan Board of Works, with what success the sequel will show, viz:—

I propose to obtain twenty-four tons of salt water, more or less, per minute by means of steam machinery erected on the sea coast near Brighton (or any better adapted or more convenient site) and to lead it into the Thames, using the embankment of the line of rail for laying down the pipes, to branch off into two heads, one in the vicinity of Chelsea Bridge, the other at or near Blackfriars Bridge. By these means a constant supply or stream of salt water equal to 6 miles long, 669 feet broad, and 2 feet deep, would be forced into the Thames every month.

I need not point out the properties of pure salt water when brought into opposition with that now in the river between Chelsea and Deptford, further than that the salt water thus injected would find its way to the bottom of the river, thereby raising it, and consequently the sewage matter, to a higher level; and as the course of the tide is stronger on the surface than near the bottom, the putrid water now in the river would constantly, though gradually, be carried out to sea,

and the offensive substance on the bed of the river would be totally destroyed by its saline action.

The salt water forced into the river by my process I am aware will slightly amalgamate with the fresh water above Chelsea, but it will create a larger supply of the latter above or beyond this limit, and it will be thus checked in its progress upwards. A similar plan to mine of laying down the pipes may be seen between Kingston-on-Thames and Lambeth, belonging to the Lambeth Waterworks Company.

I also stated the important fact, viz., that it could in like manner be connected with all cesspools, closets, &c., and by means of separate sewers the whole of the feculent matter of the metropolis might be carried off to any fixed place, and its properties as a fertilizing agent preserved;—which could be made part of the present main drainage scheme. It could also be applied to the cleansing of the docks (the existing state of which materially assists to keep the river in its offensive state) or to supply the place of fresh water where the latter could be dispensed with. In cases of fire its saline properties would be sensibly felt in the extinguishing of that dreadful element. The supply would be regulated by the demand.

Placing my plan in juxtaposition with the main drainage scheme, now in course of construction, it must be borne in mind that the cost of the latter will be immense, with a constant drain on the public purse; whilst that proposed by me, although costly at first, will eventually create an enormous revenue, and the benefit that will accrue to the public will be incalculable. In fact, it will be the greatest boon ever offered to the citizens of London. There are many other points of note that might be added, but I trust enough has been stated to show its practical as well as efficacious results.

To my proposal I was favoured with the following reply from the Board of Works, viz.:—"That several very similar suggestions have already been laid before the board, but the practical difficulties in the way of their execution have by competent judges been considered insuperable." Whether the feasibility of carrying out these grand theories is to be entirely set aside I shall leave public opinion to pronounce.

Whilst on this important subject I will endeavour to prove that the quantity of liquid sewage proposed to be discharged into the river at Barking Creek and Crossness Point, as set forth in the report of the Metropolitan Board of Works, dated 12th August, 1859,* amounting in the aggregate to 98,437,000 gallons, equal to 15,749,920 cubic feet, daily during two and a half hours on each ebb tide, will create a dangerous flood tide from the following causes:—

1st.—That this large body of water *will not* find its way beyond strong tidal influence, or reach a distance of forty miles in five and a half hours.

* My first communication with the board on the subject of purifying the Thames is dated one month prior to the publication of this report.

2nd.—That it will meet with a resistance by its own action.

3rd.—That the 9,375,000 gallons of sewage which is to be let into the river throughout the twenty-four hours from the outfall at Cremorne will be as 1 to 50 of the quantity discharged from Barking Creek and Crossness Point, thereby leaving an immense vacuum between the action of the western outfall and the sewage forced into the river by the eastern ones.

4th.—That the incoming flood tide meeting at first with the resistance of so large an artificial body of water as above described must increase in volume and strength till, with an impetuous rush, it will prove, in a measure, *dangerous to the shipping*, as also tend eventually to *materially injure it as a navigable and fresh water river.*

5th.—That by destroying the natural action of the ebb through diverting a portion of it and the rainfall, &c., from its legitimate course, it must disorganize the flood tide to an alarming extent.

6th.—And lastly, if the quantity of fresh water sewage that is to be discharged at the eastern outfalls at high (salt) water (throughout the year of itself sufficient to create a river 50 miles long, 1,000 feet broad, and nearly 22 feet deep) eventually finds its way to sea, must its place be proportionately supplied or not with salt water? I pause for a reply.

In the last published report of Dr. H. Letheby on the state of the river, I find the following, viz.,—"During the last month the saline constituents of the water at London Bridge have been as abundant as they generally are at Greenwich. This shows that the tidal or oceanic wave has advanced to a considerable extent beyond its usual limits; *and it is open to doubt whether any of the downward current of the river has reached the sea.*" Supported by this fact, I may ask the promoters of the main drainage scheme to disprove the arguments herein stated.

I am, &c.,

N. HECKFORD.

To the Editor of the Nautical Magazine.

[Having always been averse to making the Thames the great receptacle for the sewage of our metropolis, and regretted that a more appropriate application of it has not been found than in the measures of the Board of Works for their great main drainage scheme, we are not sorry to be enabled to record Captain Heckford's scheme in the pages of the *Nautical.* This at all events in the long run would be productive of purity, while that of the Board of Works will be productive of impurity, and that to an alarming extent. The fact of a stream of sewage running into this river during the half of every ebb tide must infallibly occasion a state of the water in it between the middle of *Sea Reach* and *Barking* that is fearful to contemplate. We tremble for the effects of poisonous exhalations to which the crews of those ships will be subject that will have to ride out the ebb in that part of our river, and for the unhappy inhabitants of its banks. To us it seems to be bringing down on them deliberate destruction. The ships, it is

true, can avoid it, by not staying at anchor in such a filthy element; but towns are towns, and homes are not so easily shifted. Nor shall we be surprised to find some day hereafter that the port of London will see its shipping diminish in consequence,—those ships that have contributed to form its forests of masts,—having found some other port where the health of their crews is not injured by the pestilential vapours they encounter in the Thames. But such a condition of things is evidently approaching, and the flowing tide instead of bringing up the river the healthy exhalations of pure salt water will come polluted with the sewage of the metropolis as a present for us from the Metropolitan Board of Works. They manage these things, as Sterne says, much better in France.]

The French in Madagascar.—1642 *to* 1672.

(Concluded from page 531.)

Let us look back for a moment and see what was passing in France. The Marshal de la Meilleraie had died without the loss of several ships and difficulties of all kinds having tired him of a project which he had entertained for twelve years, and the Duke de Mazarin, his heir and successor, had to defend himself against the old company, which, although the period of their title had passed away, and although by their neglect they had compromised their own interests, claimed from the Duchess de la Meilleraie and her son an indemnity of above 200,000 livres; but the company lost their suit and were condemned themselves in 10,000 livres of interest. The Duke had expended 400,000 livres himself on the colony. Since the death of Flacourt he had made every effort to preserve French authority in the island and to make it a source of commerce. He had, in fact, done more,—he had made the cause popular: unhappily, he had not profited by it, and at his death it assumed a new phase.

The affairs of France had become quiet; Louis XIV. was married and had a son the Dauphin; Colbert had succeeded Fouquet; and the French, encouraged by neighbouring states, had entered something more warmly into distant commercial voyages.

As the Duke de Mazarin was disposed to make new arrangements in concert with the Marshals de Navaille and d'Aumont, not only with the view of strengthening the French establishments in Madagascar, but also to find a commercial *entrepot* for the Indian trade in the Red Sea and on the western coast of Africa, Colbert himself formed the plan of giving this the character of a great commercial enterprise. In the month of April, 1664, the subject was matured, and Charpentier published "The Discourse of a faithful subject of the King respecting the establishment of a company for trading to the East Indies."

On the 21st May the first meeting of the principal members took place, at which Berryer presided and displayed considerable zeal for the success of the enterprize. The report agreed on was laid before the King, and at a conference with the Marshal de Villeroi, d'Aligre, and Colbert, the statutes were approved of on the 5th of June for submitting to the first general meeting, at which above 300 members were present. The approval of the King was then made known. The statutes were read, and, pending the election of twenty-one directors for the administration, twelve syndics were named. Some days afterwards, the king, who had granted for the arms of the company's seal a globe d'azur, with fleur de lis of gold, the motto "Florebo quocumque ferar," and for supporters effigies of peace and plenty, invited the municipal authorities of the country to send their approval. The East India Company, on their part, gave notice to all artisans and the gens de mestiers Francais who would go and live in Madagascar and India that they would afford them the means of living most honestly by appointments with reasonable salaries, and those who would live there for eight years his Majesty would allow to be masters of chefs d'œuvres in any of the towns of France where they might desire to establish themselves, without any exception. Those who accepted the offer to appear at the company's office.

Other advantages were added. In fact no others were engaged, but colonists, who had their passage gratuitously, a piece of ground, provisions for three months, and utensils at a very moderate price.

Two articles of the agreement may be worthy of quotation here. "Justice," it was said, "shall be awarded to the natives of the country as well as to the French, without distinction of person;" and then,—"It is expressly stipulated that no one shall have in his house any woman of bad character, under pain of exemplary punishment."

On the 20th March, 1665, the directors were named. Colbert was president, and the prevot de marchande vice-president. From which time subscriptions flowed in. The Queen Dowager had subscribed 60,000 francs; the Queen and the Dauphin the same; the Prince de Conde and the Prince de Conti 20,000 each. The sovereign court offered more than 1,200,000 francs; the corps de marchands 650,000, in which sum the mercer's company was named 50,000; and the gens de finance supplied a sum of 2,000,000 francs. After the corporations came special subscribers, receivers-general, secretaries of the King, councillors, governors of provinces.

Among the names of subscribers appear those of d'Aligre, Comptroller of Finance, who gave 60,000 francs; the Comptroller-general Hervard; the Marshals de Villeroi, de la Ferte, de Plessis, Praslin, d'Estrée; the Dukes de Roquelaure, de Richelieu, de Montausier, de Retz, de Grammont, de Saint Simon, de Navailles, de Coislin, de Luynes; the Marquises de Grignan, de Brancas appear near those of the Secretaries of State de Lion and de Guenegaud and the Master of Requests Tallemant. In fact, the same list contains names of the equally illustrious de Seguier, the Advocates-general Talon and Bignon, de Nesmond, de Mesme, Viole, Molé, the Abbe de St. Croix, Pontehar-

train—then President of the Chamber de Comptes, the first President Lamoignon, and the two Caumartins, one Councillor of State, the other Master of Requests.

After the court came the provinces. Lyons took 1,000,000 francs; Rouen, 550,000; Bordeaux, 400,000; Tours, 150,000; Nantes, 200,000; and smaller sums by St. Malo, Rennes, Toulon, Grenoble, Dijon, Moulin, Bourges, le Havre, Marseille, Dunkerque, Metz, Amiens, Laugres, and Chalons.

The period of concession was fifty years; the powers of the company admitted the right of naming civil and law officers, as well as military, and of sending ambassadors to make treaties.

As to the mode of finances and the titles borne by those interested in the company, they were the same as those of the present time.

The sums subscribed were to be included in three payments. One in the first year, another in the second, and another in the third; but if the second or the third payment was not made after the first, this was forfeited, unless it was sold to some other person who would pay up the rest.

When money was paid into the hands of the cashier he gave a receipt for it on parchment signed by himself, which was coutersigned by two directors, and registered in the books of the company by him to whom it belonged, and the folio, &c., wherein it was noted was marked on the back of it. This document, thus registered, formed the title to the shares, and was also registered in another book, with the particular sum which its holder had in the company.

Such was the commencement of the famous East India Company, of which such great hopes were entertained, realized by others. It began by sending out agents to India in the month of October, 1664. Previous to this, in March of the same year, a squadron had been sent out from Brest, carrying 248 passengers, composed of the *Taureau*, Captain Kerkadiou, the *Vierge de Bon Port*, Captain Truehot de la Chenaye, the *Aigle Blanc*, Captain de la Clochetrie, and the *St. Paul*, Captain Veron, a clever and experienced seaman, who commanded in chief.

M. de Beausse, a brother of Flacourt, a man of superior mind and full of ambition, was on board this last mentioned ship, and had the title of first president or chief of the council of eastern France, keeper of the seal, and assisted in his office by six assessors. These were Champmargou, captain-commandant of the company's army; Montauban, councillor of Anjers, who had the charge of administering justice in the island, or judge civil and criminal; and, lastly, four merchants, viz., Houdry, Chevry, des Escards, and Hallot, who had the charge of books, cashier, charge of magazines of arms and provisions, and charge of magazines of merchandize. A secretary (Rennefort) was attached to the council, who was with M. de Beausse in the *St. Paul*. This latter gentleman having been taken ill when passing the Cape of Good Hope, the *St. Paul*, availing herself of her superior sailing and leaving her companions, anchored at Fort Dauphin on the 10th July, at the time above alluded to when, thanks to

La Caze, the war with Dian Mananghin was terminated. Rennefort, on the part of M. de Beausse, who was detained on board by his illness, went and informed Champmargou of the death of the Duke de Meilleraie, of the renunciation of the company by the Duke de Mazarin, and the events which had followed it, as well as the intention of the company with respect to him.

On the following day Champmargou repaired on board the *St. Paul*, and it was decided between him and M. de Beausse that on the 14th he should send to Fort Dauphin and to Madagascar the orders of his Majesty that he should make an inventory of everything which belonged to the Duke de Mazarin, that the company might give an account of it to him; that Champmargou should remain with the appointment of captain of all the militia of the island; that all the French in Madagascar should be conveyed to France free of expense, or engaged in the service of the East India Company on condition that they paid a rental for the land they occupied, and that they should be bound to do *guet et garde*. These conditions were accordingly published.

On the day specified Rennefort took possession of Madagascar in the name of the King and the company. The number of the colonists then amounted to 100, thus distributed,—two at Galemboule, two at St. Mary, eight at Manambari, and twenty-four at Fort Dauphin; and, saving some occasional quarrels with the natives, quietness was established in the island. Dian Mananghe himself, who had learned that the French had obtained further assistance, and that "a cow had calved a monster, half beast and half man," had given in his submission.

The three ships on their way to the island, however, did not arrive. Champmargou attended to receive the appointment to the station which had been offered him, when M. de Beausse, who was always ill, had become sufficiently recovered to enter on his duties. This gentleman, on his own part, declined appointing the council, as his colleague might not approve of his doing everything. Rennefort proposed to add La Caze and Veron, and the president was compelled to submit on account of the opposition which had begun to show itself. He had already made some discontented. A number of chiefs had arrived with presents, and among them was observed Dian Nong.

This princess in espousing La Caze, by whom she had three children, had renounced her religion. She had come, accompanied by the people of Amboule, in her palanquin, borne by slaves and escorted by sixty females and four hundred armed men, commanded by La Caze. According to an eye-witness of this scene, Dian Nong was still a great beauty. She had handsome teeth and fine sparkling eyes; her mantle was a fabric of silk and cotton, she was covered with garlands of coral and small beautiful shells, her legs and arms were ornamented with golden rings, her hair fell in loose tresses over her person, and large flat pieces of gold hung from her ears.

She left her palanquin about 500 yards from the fort, and approached it, preceded by twelve of her female attendants, carrying

baskets of flowers and ornaments of gold and silver, in each of which was a precious stone. Her other females carried baskets of fruit and other produce of the country, and, with ten oxen, all these were presented to M. de Beausse, who, in accepting the presents, gave Dian Nong in return some glassware, of which no doubt she did not know the value.

While this was going on, the *Taureau* arrived. M. de Beausse was eventually established in power, and Champmargou embarked in this vessel for Bourbon, where he left some twenty workmen. He returned afterwards to Galemboule, where he visited Fort Paillard; from thence he went to St. Mary, the military post of which was commanded by M. de Belleville, and here he found the *St. Paul*. He went afterwards to Antongil Bay, where Fort St. Louis was established with a garrison of twenty men; and in returning along the coast to St. Mary the *Taureau* met a southerly wind, with a current, which drifted her to the northward and obliged her to anchor on the coast.

Champmargou landed with some men to examine the country. In the mean time the *Taureau*, which could not keep her anchorage, was forced to make sail to seek a better, and for fifteen days Champmargou and his men were looking in vain for their ship, undergoing severe privations, almost starving, and obliged, in order to obtain the means of subsisting, to use threats which they could never realize. They were driven from one village, and ran the risk of losing their lives by breaking a vase which the natives had lent them. Driven by hunger, they were reduced so much as to discuss the subject of sacrificing one for the subsistence of the others.

They entered swamps without knowing whether they would ever get out of them and were often tracked and pursued by the natives; scarcely able to drag on, they scrambled up heights to get a glimpse of the horizon, if possible to discover the sails of the *Taureau*. At length they arrived at a village where they learned that white men were in the vicinity. By a severe effort they discovered them where they were told they would, and found they were six men belonging to the crew of the *Taureau*, famishing and as badly off as themselves, in consequence of the loss of the ship.

The *Taureau*, on leaving her first anchorage, had stood along the coast with a strong breeze and had come to a bay, and, desirous of entering it, had got among reefs at its opening. The wind, along with the current, set across the ship's course, and drove her on a bed of rocks. The efforts made to avoid them were the cause of her loss, for she refused her helm and drifted. The first shock broke away her rudder, and in a short time she had four feet water in her hold. There was nothing to be done but to save the arms and ammunition and provisions, when a gunner, less under the influence of dismay at the state of affairs than that of eau-de-vie, which he had managed to find in the captain's cabin, on lighting his pipe set fire to a case of cartridges.

He was the only victim to his imprudence, but the event tended to

increase confusion and disorder, for some of the men jumped overboard in the vain hope of swimming ashore, others went to confession, and the *Taureau* showed symptoms of going to pieces, when a Flemish sailor took the end of a line and swam ashore with it. The sea was running high, and his progress was watched from the ship, full often being lost sight of, with the deepest anxiety. But at length he gained the shore, after an hour of contest with the waves. By means of the line the end of a cable was drawn on shore and secured round a tree, and this, after being tightened by a capstan, became the means of saving those who had not attempted to swim on shore, all of whom lost their lives, excepting this Flemish sailor.

Those who had found Champmargou were, as might be imagined, in a most distressed condition. But they had to make a journey of eleven days to reach Antongil Bay, and a passage of fifteen days to arrive at Isle St. Mary. Two only did so. M. de Belleville, on learning their misfortunes, sent boats in search of them. The *St. Louis* being at St. Mary, he had arrived at Fort Dauphin and prepared to explore the whole shore of the island. Her captain informed M. Champmargou of what had happened in his absence,—the death of M. Beausse, the events of the war, and the considerable increase of the colony. Soon after M. Champmargou had quitted the fort the *Vierge de Bon Port* and the *Aigle Blanc* arrived. Madagascar had become the centre of operations of the company, and the ships had gone to trade along the coast.

On the 14th December, 1665, Pierre de Beausse died from the effects of his labours and anxiety of his position, adding as they did to his malady. He nominated M. de Montauban as his successor, but, however well he might manage affairs, his inertness of disposition never admitted of that healthy condition which M. de Beausse had given them.

La Caze, on his part, continued his successes. With 30 Frenchmen and 600 natives, divided into two parties, one under his own command, and the other under that of Dian Ramahaie, invaded the Manamboule territory, governed by Dian Ramaras, the sworn enemy of the French. They burnt a great many villages, and among them the important one of Manampy. Ramaras was near this village with his men, but he abandoned it after the third discharge of fire-arms.

La Caze afterwards ravaged the country of the Lavaleffes, natives with long spears, beyond the river Manghouron. These are no doubt the Hovas, here mentioned for the first time, who are now the masters of the island, and who did not commence their conquests for a long time afterwards, The chief of these people had carried off a daughter of Pronis, had kept her as a wife, and had refused to restore her.

When La Caze returned from his expedition with a considerable number of prisoners and 20,000 head of cattle, Champmargou, just returned also, was the governor of the colony. He was at variance with the council of merchants, a condition of affairs which only terminated with the ruin of the colony. The exertions of the council were unanimous against his exorbitant demands. He appropriated

to himself, as the governor, a large share of the booty of La Caze, and the syndic were reduced to the condition of being obliged to make purchases from him to supply the wants of the colony.

La Caze was nominated as a lieutenant by the council, and presented with a sword of honour by that body. Flattered by such attention, to which he was not accustomed, he offered to effect the conquest of the island if he were provided with 200 French soldiers; but his proposal was no better received in France than it had been by the governing council of the island.

The new company in the mean time took to its work more seriously than its predecessor by continually sending out ships. On the 14th March, 1666, Francois de Lopis, Marquis de Mondevergues, with the title of Admiral and Lieutenant-General appointed Commander-in-Chief of the French possessions beyond the equator, left Rochelle, and on his way out was convoyed as far as Cape Finisterre by M. de la Roche, in command of the French man-of-war *Ruby*. He had on board the Directors-General Lafaye and Caron, and 2,000 seamen, soldiers, and colonists. This fleet, delayed by numerous stoppages and contrary winds, did not arrive at Isle Bourbon until a year afterwards. The fleet anchored in the roads of St. Paul, revictualled that colony, which had not been done since the voyage of the *Taureau*, and arrived on the 10th March, 1667, at Fort Dauphin.

The establishment was then in confusion. After the death of M. de Beausse, Montauban had gone to France, as well as Rennefort, the Secretary of the Council, and the greater part of the merchants. Champmargou and a merchant named Chevry by their exactions had occasioned the revolt of the colonists.

The administration of Mondevergues contributed but little to the prosperity of the colony. Always differing, like his predecessors, from the mercantile agents, he had constructed an intrenched camp at a distance from the fort for four companies of soldiers, to which he retired. He appeared at the military and naval councils, but never at those of the commercial or for the subsistence of the colony because he could not lead them. The directors were all-powerful in those and dissent was the stumbling block of the colony, and never was it so difficult as now to obtain provisions. The native population, notwithstanding their natural mild disposition, had become entirely hostile in consequence of the manner in which they had been treated. One day Mondevergues went to the subsistence council, which was, so to speak, sitting in permanence, and was not even heard.

It was owing to La Caze again that they were relieved from this condition. Accompanied by his friends Dian Ramahaie and Dian Ramahirae, he made a sortie among the Machicores, and carried off 1,200 head of cattle. Champmargou also made an excursion into the upper country of the Mahafales, and in a conflict with these people the French for the first time made use of horses against their enemies. The simple minds of the natives, terrified by a mounted soldier, were panic stricken, and they fled; but Dian Rasaf having

been killed in flight, one of his people, in his despair, determined to sacrifice his life to avenge the death of his chief, turned round, waited with firmness the approach of the animal, plunged his spear into its breast, and broke the charm.

This double expedition, however, raised the French name. Dian Mananghe, their indefatigable enemy, and Lavatanghe, with whom they had taken refuge, beginning to think that they were never to be revenged of them, were feign to submit. This, however, was not what the merchants of the company nor Mondevergues had desired. The latter, jealous of his authority being disputed, ruled by the commercial agents and La Caze, who knew the country better than he did, and the others could not find that mode of making money which was so easy to do in India. Every one was discouraged and disgusted with intestine strife, and the every day hostilities with the natives.

Lafaye, Caron, and Flacourt, the sons of the old governor, left the island for India, where, later still, the same causes produced the same results. Mondevergues, in his turn, departed for France, leaving Champmargou as Lieutenant-General, and with him La Caze, disappointed at all his efforts proving useless. The *St. Jean*, in which they were embarked was unable to round the cape. She was obliged to anchor at Madagascar, and La Caze found himself with the appointment of Major of the island, brought to him by M. de la Haye. Under the direction of this person matters might perhaps have assumed a better appearance; but scarcely three months after his appointment he was seized by a disorder peculiar to the country, and died after a few days' illness.

M. de la Haye, appointed on the 5th of December, 1669, Viceroy of Isle Dauphine, and armed with far more extensive powers than any of the preceding Governors, left France on the 30th March, 1670, and arrived on the 23rd of November, with a squadron of nine vessels. The company having determined to have nothing to do with Madagascar, M. de la Haye took possession of it afresh in the name of the King, and inaugurated himself with much pomp as soon as M. de Mondevergues quitted it for France,—to be arrested on his arrival and thrown into prison at Saumar, like La Bourdonnais afterwards, by the hatred of his rivals.

The war was no longer carried on as at first, when some French, with the assistance of a band of black soldiers, routed an army of natives. In the month of January, 1671, before the death of La Caze, and when symptoms of that illness appeared which was to deprive the colony of its real supporter, Ramoussaye had given his daughter in marriage to Ramilange, the enemy of the French. La Haye at the same time went to Andravoulle, in order to attack the former, with six or seven hundred European soldiers and the same number of natives in the Manambare. In the first engagement a considerable proportion of French troops were wounded. Ramoussaye retired to a mountain, where Champmargou and M. de Grateloup, who commanded detachments, attacked him in an intrenched palisade.

Three Frenchmen were killed in this second affair, and an officer seriously wounded, while Ramoussaye retreated into the woods.

In the mean time M. de la Haye was taken ill, and was obliged to stop at Andravoulle with La Caze, who was also ill. He proposed an amnesty to all those who would abandon Ramoussaye, and many did so. M. de Grateloup returned to the fort with a party of soldiers; the rest, under the orders of Champmargou, continued in pursuit of Ramoussaye.

M. de la Haye then went to Bourbon in the hope of recovering his health, and took possession of the island for the King of France. He succeeded Renaud, who had commanded there since the commencement of the colony by one named La Hure. It was during this voyage of La Haye that La Caze died, and his appointment was given to his son-in-law La Breteche. On the return of La Haye, Champmargou, with M. de Fremont and some forty soldiers, was in search of Ramoussaye, who concealed himself with Ramilange.

La Haye, finding nothing to do worthy of him at Madagascar, took his departure in August for India. The destiny of his squadron is well known, the first which France had sent to those seas. La Haye, in 1674, after three years of war, being forced to deliver up Fort St. Thomas, which he had taken, and having lost all his ships, returned to France, with his officers and soldiers, in two Dutch ships, by virtue of the capitulation. He passed in sight of Antongil, which appeared to him deserted, and saw nothing, when sailing along the coast, of the old establishments. At length, arriving off Fort Dauphin, he found the coast quite deserted. There remained no vestige even of the dwellings, which extended as far as five miles from the coast. Nothing was seen save the walls of the fort, which even yet bear the names on their architrave, and the arms engraved in the stone, of M.M. Carron and Flacourt, Directors in 1667.

How was this? Ten days after de la Haye had sailed for India Champmargou had died, carried off by an epidemic to which about 300 French were victims. La Breteche had taken the command. Like La Caze from a low station, on attaining a more exalted one he was unable, like his father-in-law, to use that finesse and that intuitive perception which gave him so great a superiority over the native but intelligent mind of the people of Madagascar; so that he was incapable of making those efforts against his enemies that La Caze knew how to insure by introducing some to overcome others. Every day he had to repel the attacks of Dian Ramoussaye and Dian Mananghe, who, seeing the depressed condition into which the colony had fallen, made incessant efforts to destroy it.

Ramoussaye did not foresee this result. Having invaded the territory of the Matatanes with his son-in-law Ramilange, he was surprised and massacred, with the greater part of his people. The ancient hatred of Dian Mananghe was renewed. He found new enemies in the colonists and excited the negroes against them, who had been the most attached, and laid the scheme of a general massacre, in which he succeeded too well. For this he selected Christmas

night of 1672. Every house was on fire in an instant,—women, children, and those who were sick perished in the flames. At the same time the church, at some distance from the fort, was set on fire. This had been captured, abandoned as it was by its defenders, and daylight broke on some unhappy mortals who had escaped this disaster, and who barely succeeded in gaining their liberty, leaving behind them, but not without regret, this extensive and beautiful island. What might it not have been in these days if the same efforts had been expended there which have been so successful at the isle of Bourbon, the refuge of the Madagascar colonists, rich as it is while these lines are committed to paper.

[The foregoing is translated from some numbers of the *Moniteur de la Flotte*, terminating with No. 43 of this year. Bourbon is now known as Isle de la Reunion. Our readers will not fail to observe the principal cause of failure of the French settlement, in pursuing a course so opposite to that by which the natives are gained rather than set at defiance and slaughtered. But it is remarkable that the origin of the failure of the Portuguese in Japan may be attributed to the same cause as the French in Madagascar.]

The Religious Condition of Seamen.

In offering a paper on the subject of revealed religion to the readers of the *Nautical Magazine*, I am guided by the fact that the position of sailors has many peculiarities, which twenty-five years of sea life have brought to my notice, and I make no apology for doing so, considering that every man ought to strive to bring to the notice of his fellow men this all-important subject, over which business and natural inclination are so inclined to ride rough shod, leaving it to women and children, sick men and clergymen, but making it no part of the active man's daily study and practice.

Every one will allow that man is an immortal being, travelling fast through the first stage of his existence. and that his conduct whilst here has an all-important influence upon his hereafter. Also, that there are innumerable difficulties springing up to deter him from leading that life which is required to prepare him for an eternity of happiness hereafter; that this life is beautifully explained in the Bible, more especially in the New Testament, where it is illustrated by a Perfect Example, so that if the heart be right, "he who runs may read."

It seems further to be an established fact that the mere knowledge of truth will lie dormant on the mind, especially if from a superficial view and want of that all valuable principle, faith in God, man thinks his temporary interests may suffer through his giving it due attention.

Observe the history of the slave trade,—how impossible it was to get those whose pecuniary interests were likely to suffer to see that it was wrong to buy and sell human beings. Again, see how Christianity, backed as it is by such promises of assistance and the example of a perfect character, has had to force its way through all sorts of difficulties, and been subjected to all kinds of abuses, by those who have called themselves Christians, just because its evidences have forced it on the understandings of men when their hearts have been retained by the world and all its vicious allurements. Hence the necessity for bringing religion prominently to the notice of all classes, and therefore including sailors.

We will first consider some of the difficulties which oppose true Christianity amongst human beings in general and then the phases or cloaks which they assume in the peculiar experiences of sailors; for the enemies to holiness in man are the same, only they take upon them different forms, dependant on his professional or general pursuits.

The first sin was the fall of Adam and Eve, which we are taught was the result of believing in spiritual wickedness in high places instead of God's word, from which has sprung want of faith in God, (or what is so truly called spiritual death,) and consequently dependence on ourselves, or the interest we can make with our fellow creatures, for every good we require. Hence the meanness, deceit, and selfishness which abound in the world, instead of honest straightforwardness with a full reliance on God's Providence. No wonder faith is so forced upon our notice as the first step towards holiness, for it is to be feared that numbers from their hearts think it impossible to get through the world by strictly doing their duty and trusting the result to Providence; or even more commonly they feel their own weakness, and yet do not go to the Great Physician for health. Here they cast to one side the Bible and its teachings, taking up in its place custom and inclination for their rule of conduct.

The great Author of our being does not throw away labour, and would not have given us his Son if less would have purchased Heaven for us, or fitted us for that happy place where all love God with all their hearts and their neighbours as themselves. This is the healthy state towards which the true Christian is tending, and he ought to watch and pray earnestly for his quick progress, for though it does not save him, still it proves his faith in the *Saviour, blessed Saviour*, who by his own merits *alone* has purchased Heaven for believing man.

It seems that the first thing each and every man has to convince himself of is, that since the fall many do reject religion from their minds and live without it, until death surprises them perfectly unprepared to appear before their Maker; that he may be brought to lead a good life through Christianity; that the distaste for religion which is natural to him in his fallen state may be taken away, and that it is not the circumstances around us, but the hearts within us which prevent our doing right. "Make me a clean heart, oh, God! and renew a right spirit within me," must be our prayer; not, "Take me out of this bustle and put me into a quieter life, or into a monastery, for then

I will be holy." No! for we must remember, "The devil finds work for idle hands to do." The beauty of the Christian religion is that far from unfitting us for our duty it lays hold of soldier, sailor, or one in any of the walks of life, and makes him better in his profession, more useful to others, and a new being with respect to his future prospects! insomuch that he can even rejoice when thinking of death, because for him it is but the door to eternal happiness. Meanwhile, he is independent of outward circumstances and must be happy. Look at Stephen when in the act of being stoned: this is the kind of support which God can give to those who love him.

If pure Christianity be advancing in the world, which I am inclined to hope is the case, there is still very much to be done before man is what God would have him to be; but He who gave the command that we should aim at perfection, can enable us to fulfil it. Let man believe God's power and distrust his own, as well as strive and pray, then he must succeed. Instead of this, many follow a kind of routine, looking for no religious change in themselves, and not believing that it takes place in others, because they use the present state of their own minds as the standard by which they measure all others, and yielding to the overpowering influence which custom and their tastes have over them, they think themselves fair specimens of good Christians, and condemn any who profess to have higher or more heavenly tastes than themselves. But it seems to me that it would be as reasonable for men in all stages of a severe disease to consider their own feelings as evidences of what their healthy friends are experiencing around them.

It is true that we resemble each other very much when first born into the world, but throughout life circumstances aggravate or check the outward development of sin, and there may be great differences in conduct. Still, when circumstantial corrections are applied by God's perfect justice, there may be but little difference in our actual state until we are taken in hand by the Great Physician of souls, whose first lesson is, that without Him we can do nothing. But never let us forget that by his aid we may do anything that he thinks it good for us to be enabled to do.

"He who hungers and thirsts after righteousness *shall be filled.*" Oh! for the hunger and the thirst,—the attached promise we are sure of.

Let us impress on our minds then that God wishes us to be holy and can make us so; that the very fact of His having made creatures with wills of their own, made it possible that they might fall; that *we have fallen* and are under the influence of spiritual wickedness; that God in His infinite mercy has worked out a means for our restoration without degrading His justice; that Christ is the only medium through whom this restoration can be brought about; that humility of heart of the deepest kind is the first step homewards, feeling the truth (because from sad experience we have learnt that it is the truth) that without Christ we can do nothing. But next to this, feeling that through Him we can surmount every difficulty, ah! let it be a habit of twenty years'

standing, or something which all the world around seem to require of us, be it what it may, this mountain *shall* be cast into the sea.

Our Saviour says "*ask and ye shall receive.*" Now in asking for freedom from pain or for worldly success we are not sure that it will be good for us, therefore it is possible we may not receive it; but if we ask for a new heart and right spirit we are sure these will be good for us and therefore must receive them; otherwise there is a defect in our asking, for there can be none in the Giver. Let us make up our minds to this, beg His pardon for not having asked rightly and *ask again.* He wishes us to be holy, and promises we shall be if we ask Him. Believe Him and it must be. This is faith.

The man who loves God with all his heart also serves Him with all his heart, and nothing else can supersede God in that man's affections. For we must remember that when once God holds his right place within us every subordinate thing takes its right place. Therefrom we love our neighbours as ourselves, striving to make others as happy as we are: therefrom we wish to introduce the Saviour, who has given us all that we consider worth the name of real happiness, to our friends, who if their hearts are as our hearts will love to talk of Him, and if not it is a sign that they are in want. Hence a sailor who *practises* so little of true religion that he is ashamed to write upon it, wishes those who seem to know even less of it than himself to share his comfort and help him on.

I have here in rather a disconnected way laid before the reader my views respecting the dangerous position of all men whilst in this world: it has often pained me to see how some of those who are not sailors spend their time on board ship, when by necessity they are separated from their own professional pursuits, for many have seemed to be utterly in want of employment. Surely this ennui is but another name for that want of feeling which so often precedes death; for these very people are immortal beings travelling fast to eternity, and in many instances with only a three-inch plank between them and the next world. Still if they were asked if they were prepared to die, they would consider the querist a madman!

It is not to be supposed that the man with religious impressions feels so differently from these persons as to wonder at them in comparison with himself. No—he felt with them the same distaste for religion, the same sleepiness on a Sunday, but his Bible taught him that this resulted from the disease of sin, from which true Christianity would relieve him, enabling him to find his highest enjoyment in its study and practice. In faith, wonder-working faith, he goes on. Hence the fight and prayer for something better instead of remaining satisfied with the state in which he found himself. Therefore he prefers to study religious books and his Bible on Sundays (and on other days when a little time can consistently be spared from his professional duties), rather than drive the thoughts of death, eternity, heaven, the soul, &c., &c. out of his mind; and if he does become better than some whom he sees about him it is because reason and revelation gain the day over will and inclination.

When writing on the peculiar difficulties of sailors which I propose to do in my next, beginning with the boy as he first goes to sea, it is to be understood that no pharisaical view will be taken of of their failings. But as one of them, and rowing in the same boat, I wish to sympathize in their difficulties, and to give them the benefit of my experience towards increasing their happiness here and hereafter. With fear and prayer against my own shortcomings do I write on religious subjects. Yet feeling that each man has two important studies to follow out, neither of which should be neglected, viz., his profession by which he gets an honourable livelihood in this world, and his religion by which alone he is enabled to prepare for the next world, and in fact to do any one duty from a proper principle in this:—most carry out the first study, few the last;—hence there are full-grown men in their professions who are ignorant of the connection between the Old and New Testament, and indeed of the simple truths on which Christianity is based.

On these grounds I beg sailors to think over this subject, and if they feel it is true, not to rest satisfied until the second study is fairly commenced. A successful result to such a study is certain. Apparent impossibilities will vanish as they progress, and looking to Jesus for strength, victory is promised by Him whose word shall never pass away.

(To be continued.)

JAPAN.—*Ratification of the Treaty.*

In the by-gone pages of the *Nautical*, before even China was opened or Japan thought of, our readers will remember the interesting accounts which appeared therein of the Dutch early doings in that remarkable land. How, like the Chinese, in their utter exclusiveness of all intercourse with the foreigners, they exacted from their privileged European visitors the most abject proceedings, to which they yielded in order to secure the riches of their golden trade. Thanks to American, audacity shall we call it? this was to be put down, and Commodore Perry broke the spell. *Aperire terram gentibus* was his excellent motto, and instead of Dutch humiliation in perpetuity, we have now to record in the course of this world's events, the reception of the document ratifying the treaty which has been concluded with that Empire by our Government. We find the following account of it in that valuable print the *Daily News*, and have added to our present number more information relating to that country from the same source. At the same time we recommend to the attention of the navigator the publications of the Admiralty, which contain all that is known of those distant shores until a survey of the coast can be made, and which we trust cannot be far distant; for no where more than in the approaches to the

opened ports of that country are good surveys really wanted and indeed must be made, if our commerce is to profit by the ratification of the treaty which is thus related.

Sea of Japan, June 28th.

Nagasaki to Yeddo! Two centuries lie between these points, so near on the map, but so far and completely separated by the determined policy of the Japanese rulers, that no foreigner, though he might under the Dutch flag gain access to the first, could force or find his way to the second. A mission of Dutch tribute-bearers alone were permitted, under the most vigilant and inexorable of escorts (paid by themselves, thus adding insult to injury), to proceed to Yeddo, and offer on their knees or faces, in the august presence of the Liogun, or rather with prostrations before a screen, behind which he sat in solemn state, the bribes and offerings of the Dutch Factory, in humble token of their gratitude for the pleasant life and conditions of trade enjoyed at Decima! And if these presents, in value and number, were satisfactory, then the suite were further graciously permitted to play all sorts of antics and tomfooleries, for the especial amusement of the court and the ladies behind the lattices. Dr. Thunberg relates how they were desired to turn round, that they might show the cut of their clothes behind and before, dance European dances, sing foreign songs, feign drunkenness, &c., for several hours, until completely exhausted, they were allowed to retire, but not to rest, for, the Emperor's entertainment over, princes and courtiers pressed upon them for further amusement. It does not appear that the chief of the factory was subjected to this truly humiliating ordeal, but all the rest of his mission were made to contribute their share.

Such were the receptions granted during the last two centuries; but "Nagasaki to Yeddo" carries the imagination back yet another century, when the stout English pilot, William Adams, first led a storm-tossed and battered vessel of small tonnage, under Dutch colours—the only one of five that ever reached, and with five men alone who could walk—after a series of disasters arrived off the coast, and was sent, with his surviving companions, to the capital, made his way at court, and survived the kindly suggestion of a Portuguese Jesuit that he should be hanged as a pestilent fellow and a pirate. But now three centuries have rolled on, and Great Britain's representative is on his way, the bearer of a treaty for exchange of ratifications, and he will arrive at the capital not as honest Will Adams, in a little Dutch merchant lugger unaccredited and helpless, but in a gallant frigate under his nation's flag, and duly accredited by her sovereign to carry out the provisions of a treaty giving the diplomatic agent of Great Britain right of residence in Yeddo itself, the seat of Japanese majesty. Not as the Dutch representatives either during the two centuries past, the bearer of presents and triennial tribute, paid for leave to trade at Nagasaki under the most oppressive conditions, but empty-handed, save as the bearer of a treaty which abrogates all conditions not consistent with the dignity of a great nation and the free development of a mutually advantageous

trade. So great is the contrast that two centuries seem hardly too much time for the change to be effected. And yet it has all been the work of five years—of five years of continuous treaties, it may be said, but still they have all been crowded into that short space. The expedition of the United States under Commodore Perry, in March, 1854, first began by inserting the wedge, destined by successive efforts of foreign powers to cleave through the opposing body of Japanese tradition and policy. Admiral Stirling followed in 1855, and content, like his predecessor, with continued refusal to trade, merely stipulated for wood, water, and provisions, and humanity to shipwrecked mariners.

So much did it seem to obtain these concessions to humanity and the law of nations, that Admiral Stirling actually made a formal engagement that "no high officer coming to Japan shall alter it." It is to be presumed that the gallant admiral did not venture to preclude in all time to come his Sovereign from entering into other and better treaties with Japan; but it reads very oddly. However, he happily thought of the favoured-nation clause, and all the rest became wholly unimportant; since if Great Britain had been likely to rest content with such curtailed privileges, it was already evident other powers would force on the wedge until Japan was truly opened to foreign trade. And so it fell out. The Dutch, anxious to play a part as a power contributing to open the country they had once striven so hard to close to all but themselves, got rid of some of the most galling and humbling of the conditions of their own position by a convention concluded by the Dutch head of the factory and commissioner Mr. Donker Curtius. Then came the Russians, whom the war had taught the value of Japanese ports; and in October, 1857, Admiral Poutiatine formed a treaty. In a few days later the Dutch again, by which trading privileges at three ports were secured, Nagasaki, Simoda, and Hakodadi. Then followed, in rapid succession, American, Dutch, and English treaties, in the months of July and August of last year, by which the wedge was finally driven home, and the gates of Yeddo even were forced to turn upon their rusty hinges, and give passage to foreign resident ministers and to trade in the port of Kanagawa.

Great credit is, I think due to the Japanese rulers that they had the discrimination to perceive the time had come when their exclusive policy could no longer be maintained, and the good sense not to provoke a collision with the great powers of Europe, which could only have ended in the humiliation and discomfiture of the Japanese. The Chinese are more blinded with their conceit, and less capable of foreseeing the futility of resistance, or the hopelessness of an appeal to arms. I augur well from this for our future relations with the Japanese empire. If they receive the diplomatic agent of Great Britain without vain protestations of inexpediency, or reference to the pledge asked from Lord Elgin, but not received at the signing of the treaty, that the stipulation to receive a resident should not be enforced until 1863, when he presents himself at Yeddo, as no doubt he will, without previous communication or announcement, then I should say the rest is well assured, and can only require time and patience. Both may, indeed, be very

necessary, but they are tolerably certain to bear their fruit in settled relations of amity and commerce, which only indiscretion or violence on the part of foreigners, or very bad diplomacy on the part of the resident diplomatic agents, are likely to disturb in any serious degree.

A pleasant sea to navigate, no surveys to be depended upon, no acquaintance with headlands when you see them, and very little chance of seeing them twenty-two hours out of the twenty-four. Squalls and gales with a drenching rain and a running sea every now and then rolling in at the sternports, if in a moment of misplaced confidence they have been opened for air and light—and this in the "pleasant month of June"—not so named evidently in these latitudes. You see the land at last; a long sweep of coast with a bold outline—but where? No sun for an observation from day to day; you may be near your port, but dare not run on in the night through a dense haze, so the good ship stops her course, and you "lie to" for the night. The morning comes to find you "as you were," wind "dead ahead," squalls and rain or haze the only alternations; the sun your only hope, and nothing apparently more hopeless than its appearance. You console yourself that a blanket is desirable at night, and a pea jacket of the thicker sort an essential by day. But how long is it to last who can tell—to the end of the wet season?

More time, it seems, may be consumed in going from Hong Kong to Yeddo than is required to reach China from England. The first step towards the opening of trade with this country is a good survey of the coasts, and the erection of lighthouses or beacons—some landmarks that may supply the place of an observation and enable the navigator, when he makes the coast, to tell his whereabouts and shape his course. It is to be hoped the British Admiral, who has two surveying ships under his orders in the northern seas, will lose no time in supplying the want of all nations here, a good survey. He could not possibly render greater service to the commerce of Europe. Captain Capella, of the Dutch navy, with the *Ballé*, has already made a beginning by taking his ship through the inland sea or strait stretching between the islands of Sikok and Niphon, and coasting round the latter to Hakodadi and Neeagata, the port on the West coast to be opened to foreign trade on the 1st of January next. His report only tends to show the necessity for accurate surveys. Along the inner sea there are both rocks and shoals, and at one part he found it too narrow to allow his ship to turn. Neeagata he describes as without any harbour, only an open roadstead, which reminds me that the Russians are reported to have found fine veins of coal on the southern side of Segalien, but under the same disadvantage of no harbour in the near vicinity. Coal for steamers is a great desideratum for the navigation of these seas, from Singapore to Japan; and the country that succeeds in discovering and bringing within reach an ample supply of good quality will confer a greater benefit on western nations and the commerce of the East than can be secured by any number of treaties which do not secure this result.

Arrived at last—but I must defer until the next opportunity a

budget on "My first visit to Yeddo," and content myself with telling you that there are eight foreign vessels here and one on shore, which all came in the first days after the date fixed for the opening of the port, the 1st of July. But a sudden change in the currency by a new Japanese coinage which undertakes to reduce the dollar two-thirds in value, and consequently threatens a tax of 200 per cent. on all foreign trade, added to a strong difference of opinion between the diplomatic agents and the Japanese authorities as to the eligibility of a site fixed upon by the latter for the location of foreigners, all combined to make trade for the moment an impossibility. In the meantime it is satisfactory to know that the ratifications of the treaty have been exchanged in all honour and state.

The treaty bearing the Queen's ratification was carried in procession through the city to the Foreign Minister's residence, surrounded by a guard of marines and blue jackets, and followed by a large *cortège* of officers on horseback, with the Consul-General at their head. It was a bright summer day, rather too hot for so long a march, some four miles in the glare of the sunshine, but it was worth the chance of a *coup de soleil* to see it take its way through the great thoroughfares of the commercial quarter, lined by thousands of wondering Japanese. Such a sight had never been seen in Yeddo since Dairi or Leogu had sat on their thrones. On it wended its way through the orderly crowd, preceded by the standard bearer with his symbol of office and imperial authority, and the ward keepers at each side keep order, jingling their iron staves with metal rings. Every eye is eagerly fixed on the canopy dressed with flags and evergreens—inquiring of each other what new thing this might be in their history, since such honours were paid in the City of the Tycoon. On, over broad moat and through the massive gates in the outer line of the official quarter, armed men and *cortège* pursue their way, no stop or hindrance offered. The Damio's palaces are on either hand, and their retainers now form the crowd. The second moat and bridge is gained, and the inner *enceinte* entered, within which stands the palace of the Tycoon—guarded by yet another moat and wall—and thus to the official residence of the Minister of Foreign Affairs. There the exchange was appointed to take place, and about three o'clock signals were seen in rapid succession down the streets of Yeddo, from ward to ward, made by the dropping of a fan-like flag; and in a minute and a half, it is reported the last flag waved from the outer battery in the harbour—the concerted signal to the *Sampson* that the exchange of the ratifications had been concluded, and a royal salute marked the closing act of the ceremony.

Navigation of the Pacific Ocean.

(Continued from page 560.)

As soon as the islands East of Madura are passed, the route during the four following days will cross the space which separates the continent of Asia from that of Australia. As soon as the N.W. point of Sumbawa is gained, a course should be steered to get into 8° S. lat., and keeping on this parallel the ship may run East, a course which will clear all danger as far as Ombay Strait, where the southern route in the Java Sea rejoins the northern one, which, as we have before observed, crosses Salayer Strait. The peaks and headlands in the above route are very remarkable. The eastern peak of Lombock is seen at a considerable distance and is one of the best marks for vessels passing northward of the islands East of Java. The northern shores of these islands are generally bold, for no soundings are known off them for a mile out to sea. The dangers shown on several charts off the North coast of Lombock and marked as doubtful, have in vain been several times searched for by Dutch cruizers, so that it may safely be said they do not exist.

Northern Route in the Java Sea.—Leaving the Carimata Passage for the northern route in the Java Sea, and bound eastward, a course should be steered for the Solombo Group (782 miles from Singapore). The principal island, the Great Solombo, is nearly twenty miles in circumference. It is a singular formation, being high with a flat summit. Passing South of this island, at about ten miles distance, an easterly course should be followed for Point Layken, the S.W. point of the Celebes, and arrive abreast of Bonthain Mountain. The middle of the channel should be kept between Milieu and South Islands in Salayer Strait, so as to pass North of the Mansfield Bank, on which in some parts there are only 3 fathoms water.

In Salayer Strait the most frequented passage is that between Milieu and South Islands; it is four miles wide and clear of danger. The other channels through the strait are not sufficiently known.

Eastward of this strait and among the Moluccas, the West monsoon is the period of the fine season. In fact, this archipelago is subject to frequent fogs and squalls, brought by the East winds from the Pacific, between April and September inclusive.

Having passed Salayer Strait, an easterly course should be steered, until the high peak of Kambyna is to the N.W. Then S.E.b.E. will lead direct to Ombay Strait, between Pulo Cambing and Ombay Island. The only land near this route is Hagedis or Lizard Island. It is flat, well wooded, and from the deck of a vessel may be seen at a distance of twenty or thirty miles. The passage from Hagedis to Pulo Cambing will occupy about ten days.

The island of Pulo Cambing or Passage, (1,520 miles from Singapore by the South, and 1,490 by the North route,) is very remarkable. It is bordered by steep cliffs, at the foot of which in some parts there

is a narrow beach of sand, and in the middle of it a peak 2,000 feet high. There is no anchorage off this island.

The channel between Pulo Cambing and Ombay is eighteen miles wide; that between Pulo Cambing and Babi is eight wide; both are safe, and either may be taken as convenient. The channel between Wetta and Timor is wide and also safe, and although along the shores of these two islands are outlying rocks here and there, no soundings are to be found within a quarter of a mile of them. The shores of both are very high, and as there is generally in the day towards noon a thick fog lying over the sea, they are easier made out in the night.

Jacki Island is low and bordered by a reef. The passage between this island and the N.E. point of Timor, is narrow but safe, and anchorage may be had in the strait near the Timor coast.

Kissa Island forms with the eastern extremity of Timor a channel eighteen miles wide, which is quite safe, as well as between Jaki that and Jetti Islands.

The Java Sea may be entered by one of these channels that is most convenient.

A vessel from the Java Sea may steer direct for Torres Strait, unless desirous of sighting Cape Wessel, which, however, is not necessary. The soundings and latitude are sufficient for reaching Torres Strait, and these decrease gradually as the strait is approached. With regard to the latitude, it is found that with the westerly monsoon, in which only the sun is clouded, if the weather is bad during the day, it is fine in the night, and *vice versâ*.

For the first two hundred miles after leaving Timor, the lead will not give soundings, but beyond this soundings from 115 to 116 fathoms are found on the Great Australian Bank. These soundings gradually decrease to 8 fathoms on nearing the entrance of Endeavour Strait.

South of the route, and nearly on the parallel of 10° S. lat., there are several coral banks, 7 fathoms being the least depth over them, excepting the Money Bank, discovered in 1841, on which the least depth is 4 fathoms.

The Victoria Rock, the only danger North of the route which leads to Torres Strait, was discovered in 1843, on which there is only 4½ feet water.

Approaching Torres Strait, it will be right to keep out on the parallel of the entrance of Endeavour Strait, that is, between 10° 45′ and 10° 50′ S. lat., so as to avoid some rocks said to exist East of Booby Island, called the Aurora and Proudfoot Rocks. They are between the East longitudes of 138° 37′ 15″ and 139° 3′ 15″, and on the parallel of 10° 33′ S.

Seamen differ in opinion as to whether Torres Strait should be entered by Endeavour Strait or the channel North of the Group of Prince of Wales Island. The latter appears to be well adapted for large sailing vessels: but for steamers Endeavour Strait would appear the most convenient, especially if a coal depot be established at Albany Island as proposed.

Endeavour Strait.—Following Capt. Blackwood's directions now,

he says, whatever may have been the route from Singapore or India from the westward for Endeavour Strait, and on the parallel of 10° 50′ S., at a distance of twenty or twenty-five miles the high lands of the Prince of Wales Islands should be seen, extending from N.E. to E.N.E., and when not more than eleven or twelve miles, Wallis Island, and the most northerly, Red Wallis, should be seen from the mast-head, appearing like two small islands, of which the largest is that to the northward. The northern Wallis Island is rocky, nearly one mile in circuit, covered with verdure, and composed of ground and rocks of a red colour, to which it owes its name.

The southern Wallis Island (Woody Wallis) is low, flat, and wooded; the highest trees are on the northern part.

Between these two islands there is a channel five miles wide, which it is not prudent to take, on account of its banks; and for the same reason a vessel should not pass South of the Wallis Islands, or between these islands and the coast.

The soundings become very irregular as the strait is approached, but yet decreasing gradually to 5 fathoms, with a sandy bottom, which is found on the outer part of the bank which extends in a westerly direction six and a quarter miles beyond North Wallis Island.

To avoid this bank, North Wallis Island should be kept to the E.S.E.½E., and when eight or nine miles from the island, a vessel should steer East to pass North of the bank of North Wallis Island, on the western extremity of which there are only 1¾ fathoms of water. When North Wallis Island bears S.E. the depth will be from 5½ to 6½ fathoms. The narrowest part of Endeavour Strait will be passed; Cape Cornwall will then be seen E.N.E.. On approaching the bank of North Wallis Island the colour of the water will be seen to have changed, and if there is any sea this will be recognised in the breakers it causes. In case it is necessary to tack near its western extremity, the lead should be kept going, because the channel in this part is only two miles wide and is narrowed to the North by a sand bank, very like the bank of North Wallis Island. This bank, on which the depth varies from 2½ to 1¾ fathoms, begins on the West coast of the Prince of Wales Island and extends westward as far as the end of the bank of North Wallis Island, forming with the northern edge of this bank the entrance channel to Endeavour Strait from the West.

Again, Endeavour Strait may be entered by bringing Cape Cornwall to bear N. 78° E. known by the hill, in the form of a peak, which surmounts the promontory of the Peak.

When North Wallis Island is passed to the southward, a course should be steered so as to pass one or two miles South of Cape Cornwall. Endeavour Strait has no hidden danger and no bad holding ground throughout its whole extent. The soundings vary from 6½ to 7½ fathoms over a sandy and coral bottom.

When North Wallis Island bears South, a mile distant, the course is nearly E.b.N. for Entrance Island, distant nearly 15½ miles.

Entrance Island.—Entrance Island, with a high round hill on its end, is West of the Possession Islands, and is the nearest of the Prince

of Wales Islands. The passage South of it is perhaps the best by which to leave Endeavour Strait, being two miles wide, with a depth of eight fathoms, a sandy bottom and no hidden danger.

The two other channels, between the Great and Little Woody Island and Whale and Peaked Island, and between these and the two little islands which we find between these two groups, are equally safe although not so large.

Currents.—The currents in these channels often attain a considerable velocity; sometimes five miles an hour with the high tides; the ebb running N.E. and N.N.E, and the flood setting S.W. and S.S.W.

Having passed Endeavour Strait, the course to Cape York is direct and free from danger, and this Cape reached a ship may leave Torres Strait either by Bligh Channel or that of Raine Island.

We will now add Lieut. Yule's directions for passing Endeavour Strait from East to West.

Approaching from S.E., should the ship draw more than 18 feet of water, when she has passed the channel between the Brothers and Albany islands, a look out should be kept for a rock mid way between Mount Adolphus and Cape York, with 3½ fathoms of water on it, and having passed it, should steer for Endeavour Strait, which may be entered by either of the three channels just mentioned. The least depth in either is 4 fathoms, and the most westerly appears the best, because it is larger and has a depth from 8 to 9 fathoms, on a sandy bottom. To take this channel the ship must run West of the Possession islands, the two most westerly of which are close to each other, and thickly wooded. Having passed between these and Entrance Island West of them, the course will be W.S.W. ¼ W. for Wallis Islands, which should be passed about two miles North of the most northerly of them, and when abreast of them, at this distance, the course must be changed to W. ¼ S. for eight miles, or until Booby Island bears N.b.E. Nothing South of this course must be made to avoid the great sand bank which is West of Red Wallis Island, and when Booby Island bears N.b.E. the vessel is clear of Endeavour Strait.

Prince of Wales Channel.—Another channel, less direct, is that of the Prince of Wales Islands passing North of them. This channel, which is well adapted for large vessels, also leads to Cape York. A vessel entering it from West should pass North of Little Booby Island, avoiding the reefs eastward of it, and make the channel formed by the reef *d* and the N.W. reef, and on the other by the Goode, Hammond, and Wednesday Islands to the northward of Prince of Wales Islands. These last being passed, the course is about S.E.b.E. as far as the meridian of West Double Island, then S.E. for Cape York, where either Bligh Channel or that of Raine Island may be adopted.

Bligh Channel.—A vessel taking Bligh Channel from Entrance Island should run about thirty miles on a N.E. course, passing North of the rock *a*, and four or five miles from the Harvey Rocks. The depth of the water in this course is generally from 8 to 9 fathoms, with a bottom of sand, coral, and shells. The Harvey Rocks are 2 or 2½ fa-

thoms above the water and may be approached within a mile on either side without danger,

When Harvey Rocks bear N.W. two miles the course must be changed to N.N.E. and twelve miles run on it to pass through a group of low woody islands called the Sisters, the family consisting of Bet, Suke, Poll, and Nine Pin and Saddle Islands, &c. It would appear that the sea between the Harvey Rocks, Mount Adolphus, the Sisters, and the North coast of New Holland for the space of thirty miles is quite free from danger, so that if it becomes dark, and to anchor is not desirable, a vessel may lie to during the night, keeping a strict look out for the current, and after running nine or ten miles beyond Endeavour Strait in the space above mentioned, tacking every three or four hours.

The Sisters.—The low islands called the Sisters, are separated by channels three or four miles wide, which are all safe. The principal one is between Long and Bet Islands, and may be recognized by having near the middle a small sandy island with stunted bushes on it.

(To be continued.)

Maritime Official Inquiries.

The Loss of the North Sea Steamer.

The following report has been submitted to the Board of Trade by Mr. Travis, magistrate at Hull, who, assisted by Capt. Harris, held the recent inquiry into the wreck of the *North Sea* steamer:—

Police Court, Hull, Sept. 13th, 1859.

My Lords,—At the request of Mr. Sparrow, the Collector of Customs at this port, I proceeded on the 12th and 13th July last, to inquire, under the 433rd section of the Merchant Shipping Act, into the circumstances which led to the loss of the ocean steamship *North Sea*, upon the coast of Jutland. In this inquiry I was assisted by Capt. Harris, the Nautical Assessor of the Board of Trade, and I have now the honour to report that the *North Sea*, of the burthen of 662 tons, sailed from Hull for Gothenburg on the 26th March last. The ship appears to have been well found, and due attention paid to the soundings in proceeding across the North Sea. At noon on the 27th March they sounded in 28 fathoms mud, which agreed with their assumed position on the chart. At 6h. p.m. they sounded again in 19 fathoms sand, and at 9h. p.m. soundings were taken again in 15 fathoms sand. At this time the weather was hazy, with small rain, and the Master had expected to find deeper water on the edge of the Jut reef or bank, consequently he altered his course more to the northward, or N.E., and having seen that she was so steered, went below. Shortly afterwards the Chief Mate, being on deck and in charge of the watch, ordered the helm to be put to port, a vessel or light being reported as then in sight.

The order was obeyed, and the ship kept off her course N.E.b.E. ½ E., or more easterly, and so continued until the ship ran on shore, at about 9h. 45m. p.m. Upon hearing the order given to port the helm, the Master went on deck to inquire the cause, and having satisfied himself that he was clear of the light or vessel, whichever it might have been, went below again without inquiring or seeing that the ship had been brought back to her proper course. It would therefore appear on the evidence as it then stood, and which is sent herewith, that the Chief Mate, who was in charge of the ship, had neglected his duty in omitting to renew the course given him by the Master at 9h. p.m., and that in truth the ship was lost by this omission. At the same time I could not exonerate the Master from all blame, inasmuch as, being on deck shortly after the helm was ported to avoid collision, it would only have been natural and proper that he should have had his ship brought back to her original course, knowing as he did, or ought to have done, from the previous sounding, his proximity to the coast of Jutland. The Mate not being forthcoming on this inquiry, I thought proper to exercise the power vested in me by the Act, and adjourned the investigation at this stage of the proceedings for his attendance, retaining the Master's certificate till the close of the inquiry. The adjourned investigation was resumed this day (the 13th of September), when the Mate was in attendance, and was made acquainted with the proceedings of the 12th and 13th of July. Several witnesses have been examined, including the Mate himself, and the result at which I have arrived (and in which Captain Harris concurs) is, that the Mate did neglect to resume the course ordered by the Master (as I have suggested on July 13th), and that he does not appear to have had any justification for such a neglect.

Under these circumstances, in the position in which the North Sea was on the 29th of March (for which however the Mate was not answerable), I am of opinion that the default of the Mate was the immediate cause of the loss of the vessel, and I have therefore felt it to be my duty to forward the certificate of the Mate to the Board of Trade, to be dealt with as such Board thinks fit.

With reference to the certificate of Captain Kruger, I have (with Captain Harris's concurrence) considered that its suspension for nine weeks (since July 13th) is a sufficient punishment for his negligence, and I have therefore returned the certificate to him this day.

T. H. Travis, Stipendiary Police Magistrate, Hull.

I concur in the above report.

Hy. Harris, Nautical Assessor.

The Board of Trade have directed that Benjamin Bee, the Mate, be severely reprimanded.

The Loss of the Alma.

The official report of Mr. Traill, the Magistrate, and Captain Walker, H.C.S., nautical assessor, who held the recent investigation into the loss of the *Alma* steamship, in the Red Sea, has been issued by the Board of

Trade, with the decision of the department in the matter. The report is of considerable length, and, after recapitulating the chief facts which were adduced in evidence. thus proceeds :—

The default of Mr. Davies (chief officer) seems to have been, that during those three hours of night he never once consulted the chart nor conferred with the master; if, indeed, he considered he was under the master's orders. Had he done either he would have learnt what I (Mr. Traill) cannot but think he was wholly ignorant of—the position of the reef, and that, according to his bearings at two a.m., he was driving directly on to it at the rate of eight or nine miles an hour. I must observe further, that by Mr. Davies's own admission he never thought of slackening speed, even when he is expressing doubts about the correctness of his course; and when he does change his course it is in the most scanty way, as if he considered, not what was necessary for absolute safety, but with how little change he could escape positive danger. He had a wide and safe channel to the eastward, which was his proper course, and for which he ought to have hauled well up when he sighted Little Harnish, bearing N.N.W. a little westerly. I am therefore compelled to say that I consider the loss of the ship as proceeding from the default of the chief officer in not paying due attention to the bearings of the Great and Little Harnish, and in consequence of not hauling the ship up soon enough and far enough to avoid the danger, which, had he consulted the chart, must have appeared to him to be directly in his course, the Mooshedgerah reef at 2h. a.m. by the bearings being in a direct line with Little Harnish. The evidence, whilst it does not excuse Mr. Davies from being ignorant of the proximity of the reef, most clearly proves the great indiscretion of going with such speed during the night, in a course which he admits he found at two different periods to be too westerly, and with which he was little acquainted, and where he knew there were currents of uncertain strength and direction. I regret extremely the conclusions which I am forced to come to, for Mr. Davies seems to be an able, intelligent, and otherwise attentive officer; but where so many lives and such a large amount of property are at stake, it is not proper to admit of pleas of oversight or error in judgment. Had there been a sea on at the time the ship went on the reef, or had she not remained on it, but had sunk in deep water, the loss of life would have been very great. I should add that Mr. Davies's conduct at and after the wreck, in common with that of all the officers of the ship, is mentioned with great commendation. The certificate of Captain Henry was returned to him, no default appearing to be attributable to him. The third officer having admitted his ignorance of the position of the Mooshedgerah was admonished and informed that such neglect was not excusable. In conclusion, I beg to observe that, considering the vast importance of the traffic of the Red Sea, its uncertain currents and numerous dangers (as stated in the evidence), I would suggest for the consideration of your lordships whether a light placed on one or two of the most dangerous points is not worthy of the attention of the government.

JAMES TRAILL.

Captain W. H. Walker expresses his concurrence in the above report, and the Lords Committee of Privy Council for Trade have decided upon suspending the certificate of competency of Mr. William Henry Davies, the chief officer of the *Alma*, for a period of twelve months. The recommendation in respect to lights in the Red Sea is to be brought under the consideration of the Marine Department of the Board of Trade.

An Itinerant Bottle.

We have received the following from South Australia:—

Trinity House, Port Adelaide, South Australia.
18*th May*, 1859.

Sir,—I have the honour, by the direction of the naval officer of this province, to forward for your information the following extract from the *South Australian Advertiser*, dated May 11th, 1859.

"A few days ago, a fisherman belonging to this place (Milang) picked up on the Coorong Beach a bottle, in which was a letter dated, 'Off Cape de Verd, May 4th, 1857,' and addressed to 'Mr. James Allcan, Sheffield.'"

It is the intention of the finder (Mr. Kruse,) to forward it to the person to whom it is addressed. The underside of the bottle was completely covered with shellfish. The bottle was picked up near the mouth of the River Murray, in about lat. 35° 34′ S., long. 138° 38′ E.

I have, &c.,

Geo. E. Dellisle.

To the Editor of the Nautical Magazine.

It is clear that this bottle refused to take the usual course to the westward, but probably found its way into the Guinea Current, setting it to the eastward, thence into the Equatorial Current, but instead of drifting West past Cape St. Roque, or being like some of our bottles thrown ashore near that cape, has found its way into the Brazil Current, drifting South along with it until it has reached the easterly current in the southern part of the South Atlantic. With this it seems to have drifted eastward, till getting further North after it had passed the Cape, still drifting eastward along with those fresh winds that are found near the parallel of the Cape in the southern part of the Indian Ocean, from which it might drift into the position mentioned in the letter on the coast of South Australia on arriving within the influence of those changeable breezes on the southern coasts of that continent.

This is a remarkable voyage to have been effected with mere currents and drift in little more than two years.

Nautical Notices.

Particulars of Lights Recently Established.

(Continued from page 560.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
33. Cape Tinose	South coast Spain	37° 31·3′ N., 1° 9·1′ W.	F.	479	20	Est. 10th Oct., '59.
34. Atchafalaya Bay	Louisiana, U.S.	29° 25′ N., 91° 20′ W.	F.	49	12	Est. 1st Sept., '59. Point au Fer lights discontinued. The light is *red*.
35. Great Isaac	Gt. Bahama Bank	N.W. extreme	R.	..	..	Est. 1st Aug., '59. See No. 23, p. 440.
35. Father Point	Rimousky, St. Lawrence, Sth. shore	48° 31·5′ N., 68°30·7′W.	F.	43	10	Est. 1st Sept., '59. Lighted from 10th April to 10th Dec. Always seen when *bearing* from W.¼S. round southerly to E.b.N.½N.
36. Villa	Villa Oen	Norway	Ffl.	127	20	Est. 24th Sept, '59. Flash every four minutes.
36. Vaag	N.E. point of Vaag Isld.	67° 26′ N., 14° 1·7′ E.	F.	45	12	Est. 24th Sept., '59.
36. Andenes	.....	69° 19 5′ N., 16° 9′ E.	Ffl.	143	20	Est. 24th Sept., '59. Flash every three minutes.
36. Hekkingen	Hekking Isl.	69° 36′ N., 17° 50·5′ E.	F.	66	14	Est. 24th Sept., '59.
36. Fugleness	Hammerfest	70° 40·2′ N., 23° 40′ E.	F.	30	12	Est. 24th Sept., '59.
37. Torgauten	Frederickstadt	59° 9·5′ N., 10° 50·3′ E.	F.	37	12	Est. 20th Sept., '59. Visible *bearing* E.¼S. round northerly to S.W.b.W.½W.
38. Ostende	Belgian coast	51° 14·4′ N., 2° 55·1′ E.	F.	189	20	Est. Oct, '59. Visible *bearing* N.E.b.E.½E. round East and South to W.b.N.½N.
39. Biuro Head	Gulf Bothnia	64° 29·2′ N., 21° 35·7′ E.	F.	171	18	Est. 17th Sept., '59. Visible *bearing* from N.W. round by North and East to S.W.b.W.
39. Gottskar Sando	Ditto	58° 23·2′ N., 19° 12·7′ E.	F.	140	16	Est. 10th Oct., '59. Visible *bearing* N.b.E.½E. round by East and South to W.b.N.½N. Two lights.
40. Near Point de Walde	3½′ E.b.N. of Calais	50° 59·7′ N. 1° 55·1′ E.	Ffl.	34	10	Est. 15th Dec., '59. Duration of natural light 16 seconds. Red light 4 seconds.
41. Cape Lookout	N. Carolina, U.S.	34° 37·3′ N., 76°30·7′W.	F.	156	22	Est. 1st Nov., '59. *(a.)*
42. Revel	Gulf of Finland	.....	F.	..	..	Est. 12th Aug., '59. *(b.)*
43. Biorn Rock	.....	60° 37·7′ N., 17° 59·5′ E.	F.	42	11	Est. 29th Sept., '59. Two lights. Not to be seen bearing North to E.N.E.
44. Tigre Rock	Malta	.....	F.	71	4	Est. 1st Nov., '59. Two lights vertical, 46 and 71 feet high. *(c.)*

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

(a.)—Discontinuance of Lights.—On and after the 1st November, 1859, the following Lights will be discontinued:—

Louisiana.—Barataria Bay. On Fort Livingston, East side of Isle Grande Terre. 29° 16¼′ N., 89° 54½′ W.

Texas.—Corpus Christi. North end of bluff. 27° 37′ N., 97° 15′ W.

South Carolina.—Charleston Harbour. Two beacon lights on Morris Island. 32° 40′ N., 79° 46′ W.

(b.)—Two vessels bearing white lights are moored, one in the northern part of the eastern passage into the port, and the other in the northern part

of the western passage, at the eastern and western extremities of the breakwater; two others, bearing red lights, are moored in the southern part of the same passages. The white light in the western passage illumines an arc of the horizon from S.W.¼S. (round by West and North) to E.¼N.; the white light in the eastern passage illumines from W.S.W. (round by West and North) to E.b.S.¼S.; the red light in the western passage, from S.S.W.¼W. (round by West and North to E.b.N.¼N.; and the red light in the eastern passage illumines from W.b.N. (round by North and East) to S.E.b.S. The white lights may be seen seaward in clear weather from a distance of three miles.

In entering the port by either passage, the white light must be left to the northward, and the red light to the southward. If entering by the eastern passage in a vessel of more than twenty feet draught, care must be taken not to pass to the southward of the parallel of the red light; if entering by the western passage it will be necessary to bring the lights in that passage nearly in line, bearing about S.E.¼E.

(c.)—They will illuminate seaward from N.N.E.¼E. round by East and South, and up the harbour to the Parlatorio at Marsa Musceit, after passing which the upper light only will be seen.

It is stated in the *Hong Kong Register*, 27th July last, that a lighthouse is to be erected at Pulicat, on the eastern coast, by the sanction of the Madras Government: this will prove a great boon to the shipping frequenting these parts. The cost is estimated at 3,000 rupees. By order of the same, distinguishing marks in the form of obelisks or columns are to be erected at the numerous small ports on the Ganjam coast.

NEW LIGHTHOUSE OF COLON,—*N.W. Point of Manzanilla Island.*

R.M.S.P. "Trent," St. Thomas, W.I.
September 30th, 1859.

Sir,—Having just arrived here from Navy Bay, Colon, I beg to inform you that a new open iron lighthouse has just been completed on the N.W. point of Manzanilla Island, Colon, alongside the old wooden lighthouse, about to be pulled down. The height of the lantern 65 feet above high water mark, and shows a fixed *white* light of Fresnel's 4th order, visible at a distance of 15 miles in ordinary weather, and first lighted in September, 1859.

These particulars were furnished by the engineer of the Panama Railway Company, who superintended its fitting up.

In your Magazine for January, 1846, page 23, is printed a table for finding the ship's position by sun's altitude, drawn up by Capt. L. G. Heath, R.N. I have invariably used it since then, and have given copies to friends, but, strange to say, never met a person who had seen it before. But as I have found it most useful and correct, I think it a pity it should be lost to navigators, and therefore venture to recommend your publishing it in some future number again, and also think if it were printed on a card and sold separately, for which no doubt Capt. Heath's consent could be obtained, much advantage would be derived from it. There is one small error which requires correction at the head of Table B top of left hand column the word *lat.* is misprinted

instead of *declination*, as the precept at head of table shows was meant to be there.

With best wishes for the success of your Magazine, which I have taken in and read for years,

I have, &c.,

J. HAMMACK, *Commander.*

To the Editor of the Nautical Magazine.

Our kind friend, to whom we are much obliged for his letter, seems to have an old edition of the West India Lighthouse book. He will find the last edition to October, 1859, at our publishers' for him, in which this has all been rectified to the new light.

SOUTH ATLANTIC OCEAN,—*Nelson Bank.*

Seeing the water discoloured, brought the ship to the wind to stop her way, and sounded in 19 fathoms, muddy bottom. We were then on the West end of the bank, which apparently had an extent of two or three miles. Appearances led us to suppose that there was less water on the centre of the shoal. Our position was lat. 32° 43′ S., and long. 46° 53½′ W.

LOGAN BANK.

Captain Logan, of the ship *Rob Roy*, from Labuan to Singapore, reports having seen off Apie Point, (coast of Borneo,) the wreck of a vessel aground on a reef bearing from Marundum Island, N.E. ½ N.; Haycock Island, N.b.W. ½ W.; St. Pierre Island, W. ¼ S. The reef is not marked in the Admiralty charts and is very dangerous should it prove to be one, being in the track of vessels running between Singapore or Sarawak and Labuan.

The part in question had remained unexamined, but now shows the position of the shoal.—ED.

SHOAL *West of Bird Island,—Pacific Ocean.*

The *E. L. Frost* on her late expedition after guano, sailed over a shoal, situated less than a hundred miles W.N.W. from Bird Island, with 17 to 20 fathoms of water and a coral bottom. The shoal was upwards of fifty miles in extent from North to South. That this shoal should have been unknown until now is rather singular, considering the amount of cruizing in that neighbourhood.

POSITIONS OF SHOALS *recently discovered on the South African Coast—(Compass)*,

The Atlas Shoal (3 fathoms)—E.N.E. of Struys Point, is in 34° 37½′ S., and 20° 22·8′ E., about two miles off shore, being 22·2′ S. 86° W. (Mag.) from L'Agulhas.

The Aliwal Shoal—S.S.W. of Port Natal, is in 30° 15′ S., and 30° 50·2′ E., two and a half miles from shore, one mile long, and a third of a mile broad, with 2 to 6½ fathoms. From its shoalest part Natal Bluff bears N. 56° E. (Mag.), twenty-five miles.

PACIFIC OCEAN.—*Sailing Directions from Honolulu for Jarvis Island.—By W. C. Stone, commanding brig Josephine.*

On leaving Diamond Head a South course to lat. 19° is about the best one; but if headed off to S.S.W., I should still keep on the port tack. On attaining to 19°, or a little southerly, you will have the regular Trade from East or E.N.E.; then keep on the wind, a good rap full, until getting into 156° W., or 156° 30′. This is a great plenty, far enough to the eastward; then making a South course, you are in a position to run free with strong breezes, or to be headed off when first taking the S.E. Trades, without any anxiety. Always pass to the leeward of Christmas Island, and do not tack, even if headed off S.W., for that will not last more than an hour or so, and you are sure to make a South, and most likely a little easterly, course before reaching the line, if you wish to. After passing Christmas Island I always steer so as to be about thirty miles to the windward of Jarvis when in that parallel of latitude.

The currents are a westerly set of about twelve miles a day when in the N.E. Trades; and in about 6° or 8° N. I have always found a streak of about 2° of strong easterly currents, and have been set fifty miles to the eastward during a calm there of twenty-four hours.

The doldrums vary much, both in latitude and extent. I have carried a stiff breeze and fine weather until taking the S.E. Trades steady; and again I have had a great quantity of rain, with most vexatious calms and baffling winds, for two or three days. We speak of the S.E. Trades, but I have seldom seen them South of E.S.E., and more generally from due East as you approach the equator.

On approaching Christmas Island you will always find a strong westerly current, and if you try to go about thirty miles to the windward of it, you are sure to run on it by night; but steer for the West end, which lies in long. 157° 30′, lat. 2° N., and you will go all clear. I have shaped my course this way a number of times and not seen the island at all. If you should pass thirty miles to leeward of this island, you have no occasion to fear being able to weather Jarvis. When in the latitude of Jarvis the current cannot be calculated upon,

for I have known it to set as strong to the eastward as ever I did to the West; but this is not common.

There is one thing which I have always found in making these passages, both up and down, viz., if the wind head me off, I am always sure that it will favour in a proportionate manner in some other place. Consequently, a fair sailing ship may run free a great deal without fear of getting to leeward.

There are no other islands in this track than Christmas. Tide-rips sometimes resemble shoals very much.

Coast of California.—Captain Pierce reports that the barque *Emerald* touched on a reef between Natividad Island and Point Eugenia, on the coast of Lower California, on the evening of the 9th January, while working up to anchor under the island, but came off without any material damage. This reef lies about East, by compass, from Seal Rock, one mile distant, and breaks heavily. In very fine weather it breaks only at long intervals. That the passage between the island and point is very unsafe in the night does not seem to be generally known. I have conversed with several masters in regard to this passage, all of whom supposed it to be a deep water channel. The *Minerva* passed through at 12h. p.m., wholly unaware of danger until boarded by us. The tides run very strong, perhaps five knots, at full and change. The vicinity is good whaling ground, but vessels should be cautious of the tides and reefs referred to.

Pacific Commercial Advertiser.

Desperate Encounter with Pirates.

The following frightful narrative is from the *Bombay Standard*:—

With fifty pirates on board, twelve ordinary convicts, a guard of fifteen European Madras Artillerymen, and eight sepoys of the Marine Battalion, the *Ararat* left Singapore on the 19th of June, and arrived at Penang in the evening of the 24th. Twelve convicts were here added to the gang, making seventy-four in all.

The *Ararat* left Penang in the evening of the 25th, a junk leaving at the same time and doing her best to keep up with the ship. Captain Correya, not liking the appearance of things, dodged his satellite, and finally lost sight of the craft on the evening of the 27th. A few hours later the *Ararat* was some sixty miles from Penang.

The 28th broke gloomily, very dark, and sharp gusts of wind. At 2h. 45m. the captain ordered the mate to set topgallant sails if the weather should clear, and lay down on the poop. His rest was of short duration. Ten minutes later he was aroused by a noise, such

a one as awakens a man broadly in an instant. The noise, a crash as of something giving way, followed by a shout startled the mate also as he was standing by the break of the poop. There was no doubt as to the cause—the convicts had broken loose. Quick as thought, the captain leaped to the deck, and brought his arms—a revolver and two pistols—from the cabin. The mate as instantly aroused the guard; at the same time hailing the sentry forward, but received no reply. He remained by the night-guard muskets until the guard turned out, before which the captain's revolver spoke from the poop.

The captain, it seems, on reaching the deck, could just discern that the convicts were making their way aft. They had advanced as far as the stern of the long-boat when he fired into them. Still they came on, a tremendous rush, yelling like fiends, and heaving before them blocks, hand-spikes, holystones, firewood, curry-stuff grinders,—anything, in fact, they could lay hands on. Captain Correya was severely struck by some of these missiles, as were also several of the guard, who had by this time joined the captain (the crew, Lascars and Spaniards, being altogether without arms, having made their way into the rigging) on the poop. The gallant party had no thought, however, of acting on the defensive, but, jumping to the quarter-deck, commenced a hand-to-hand fight with the scoundrels. Both the captain and guard fired into them as fast as they could load, using also their cutlasses and bayonets to keep them at bay. They had desperate men to deal with. No sooner was a musket fired than a rush was made upon it before it could be reloaded, but in no one instance did they succeed in wrenching it from the grip that held it for life or death. One bayonet was their only spoil.

During the whole time they kept up a shower of the missiles described above, and it is only wonderful that more mischief was not done by them. Inch by inch, however, the captain and his party gained ground, advancing purposely with caution, lest from behind the water-casks a rush might be made upon them, and their arms—their salvation—be seized. And here we have to record an instance of courage as rare as heroic. Some ten minutes or so after the outbreak, amid an uproar as of hell let loose, arising from men who were thirsting for blood, the captain's wife took her part in the fray by loading and continuing to reload her husband's pistols, and passing them up from the cuddy skylight.

As each hatch was gained, it was seized by the guard and fastened down. After an hour's hard fighting the convicts were driven on to the topgallant forecastle, where they were charged with the bayonet, and several run through or driven over the bows. Two or three were seen to lay hold of the foretopgallant studding sail, which was lying on the forecastle, and jump overboard with it. They were shot from the poop and quarterdeck as well as the darkness permitted their being made out.

The deck now being clear, lights were brought. Many attempts had been made to get lights during the fight, but as soon as one appeared it was knocked over by the convicts, and the whole work was

done in almost solid darkness. The sights which the lights revealed were of the horridest. Here a man with a gashed face, there another almost cut in two, there another riddled with the bayonet, there one —yes, yet living—with four bullets through him. The aspect of the place was that of a slaughter-house. Eight dead bodies were found on the forecastle and three on the main-deck, including the European sentry and the Portuguese cook.

It was now apparent why the sentry had not answered the hail of the mate—the poor fellow was found to have been stabbed to the heart. There seems, unfortunately, to be no doubt that he had left his post below and come on deck, where he is supposed to have fallen asleep, being stabbed without awakening even to fire his pistol, which was in his hand as he lay. Had he been at his post, or even awake on deck, alarm might in all probability have been given sufficiently early to have prevented the convicts gaining the deck at all. The poor cook was shot by accident, being mixed up with the convicts.

The carpenter and an Arab passenger jumped overboard. The former fell into the bight of the lee fore sheet, got into the fore chains, and made his way aft. The Arab was never seen again. At day-break a man was found hanging on to the rudder. A rope being let down, he was hauled up, and was found to have been shot through the leg.

On search being made below, five more bodies were found of men who, on receiving enough, had gone below to die. It was found that the convicts had escaped by cutting through with a knife, of which they had somehow gained possession, a bar of a prison door forward, then partly cutting through the inside partition bar on the port side, which enabled them to burst the door in altogether. They then shouted to the rest in other cells to follow them, which, with the exception of fourteen, whom the guard were enabled to keep down, they did.

At six the convicts were mustered, when it was found that twenty-eight were dead or missing—twenty-eight out of sixty who came on deck. The remaining thirty-two, with the exception of three wounded, were treated to three dozen each.

At half past nine the sentries gave the alarm that some of the convicts had slipped their leg irons. The guard was called and secured them. On overhauling the remainder it was found that many of the irons were too large, and they were accordingly reduced.

THE RIFF PIRATES.

A letter from Paris says:—"The expedition which the Spanish government is preparing against Morocco has directed public attention to the pirates of the Riff, who first drew upon them the serious attention of Europe by their audacious attack, three years since, on a Prussian

squadron, commanded by Prince Adalbert of Prussia. Most people then for the first time learnt, and not without astonishment, that there existed at the gates of Spain, and not far from the French establishment in Algeria, Moorish tribes exclusively occupied in acts of piracy. The Riff is a province of Morocco, situate at the extreme N.E. of that empire on the Mediterranean, and separated from Algeria by the desert of Angad and of Lalla Maghunia. Protected by steep rocks, which jut out into the sea, the inhabitants of the Riff conceal themselves in the little creeks on the coast, to surprise merchant ships on their passage, and at the moment of danger they take refuge in the mountains, where it is difficult to follow them, as Prince Adalbert discovered when he made his attempt to punish them. Attention has been called to this nest of pirates by their late attacks on the Spanish settlements. M. Richard, a French officer of engineers, says, in a history he wrote of the insurrection in the Dahara in the years 1845 and 1846, that Abd-el-Kader wished to make the province of the Riff the base of his operations in a general insurrection to dethrone the Emperor of Morocco, and set himself up in his place. According to M. Richard, the Douera of the Emir was to be the nucleus of a new State, which from the mountains of the Riff was simultaneously to fight against the Emperor Muley-Abdel-Rhaman and the French in Algeria. The Riff constitutes a province almost independent, and which is connected with Morocco by the sole tie of religious fanaticism. It extends from Tetuan to Moulonia, and is divided into sixteen large villages or tribes, each governed by a Sheik. All the inhabitants are pirates. The village of Azanon particularly, situate at the bottom of a small bay of that name, is renowned for the ferocity of its inhabitants. The Azaneens belong to the savage tribe of the Guelaia. They are well supplied with firearms, and with rudely constructed barques. Several English and French merchant vessels have fallen into their hands, and have been pitilessly pillaged. A part of the population of the Riff live in caverns and among the rocks on the sea shore. One point alone of the coast is accessible for the landing of troops. This is in a small bay not far from Cape Tres-forcas, but a surprise even at this place is difficult. The French might send an expedition which, setting out from Nemours, Tlemcen, Lalla Maghunia, Sebsca, and Geronville, would take the mountainous districts of the Riff in rear, and would exterminate the pirates or drive them into the sea. But such an expedition would raise the entire empire of Morocco, and the successor of Abdel-Rhaman himself would, if he wished to consent to such a proceeding, be prevented by the fanaticism of his people, who are now agitating against the French on the other side of the Moulonia. Persons well acquainted with Africa regard the late attack of the Moorish tribes against the French advanced posts as the prelude to a more serious invasion of the western frontier of Algeria."

The Late Gales.

We have been again visited by a gale as severe as any yet experienced in this country and as usual our shores have been strewed with wreck. We find by the *Shipping Gazette* that it commenced at N.E. to E.N.E., and after blowing for some time with singular fury from those points, drew gradually to the southward and westward, and finally round to N.W., at which point it appears to have terminated. This was just the course to sweep the lines of coast most frequented by our shipping.

"On the coast of Anglesea, however, has occurred a casualty which demands a separate and special notice. The *Royal Charter*, to whose performances in the Australian trade we have had so frequently occasion to refer in terms of admiration, had arrived on Monday evening last at Queenstown, with 450 passengers and a large amount of specie, after a run of fifty-eight days from Melbourne. The following night, when the storm was at its height, the ship, it is said, was seen off the bar of Liverpool, but, being unable to get in, put out to sea as her only alternative. The next we hear is that, a few hours afterwards, the ill-fated vessel drove on shore on the coast of Anglesea, some six or seven miles westward of Beaumaris, with the loss of at least 400 lives. It is probable, from the fact of the *Royal Charter* making a lee shore of the N.W. point of Anglesea, that the gale had shifted after she left the mouth of the Mersey, and that her Commander did not, or could not, give the coast of the island a sufficiently wide berth. The passengers who left the ship at Queenstown are no doubt congratulating themselves on their providential escape; and we have only to say, that if passengers generally made it a practice to leave the ship on its arrival at the first port of call at the conclusion of the voyage, the loss of life on these coasts in passenger ships would be considerably diminished. The *Royal Charter* was as likely as any ship we are acquainted with to go safe through the Channel navigation at all seasons. But the *Royal Charter*, that but a few hours since carried a costly freight and a still more costly assemblage of lives, lies now a battered wreck on the Welch coast, almost within sight of her port! There is a moral in all this which, in these days of rapid inter-communication, ought not assuredly to be disregarded.

"It will not surprise those acquainted with the nature and dangers of this coast, to find that the loss of life and property during the late gale, so far as ascertained, has occurred just at the places named by the Royal Commissioners as requiring the instant expenditure of the public money for the construction of Refuge Harbours. Hartlepool, St. Ives Bay, the Bristol Channel—these are the localities where the dread traces of the recent tempest are most visible, and to which the attention of the legislature and of the government has been drawn from time to time in the columns of this journal, and, within the past year, by a body of men expressly nominated by the Crown to examine and report upon the existence of a necessity which every winter enforces by terrible examples. It is not too much to say that if a suitable and suffi-

cient number of Asylum Harbours had now been constructed on our coasts, the losses during the last few hours might have been considerably diminished, and that, until those works are carried out, the sacrifice of human life and property, which occurs season by season, rests with those to whom the nation entrusts its best interests, and the allocation of the public money."—*Shipping Gazette.*

THE LOSS OF THE STEAMER "EXPRESS."

Southampton.

The Board of Trade inquiry into the loss of the above steamer, which was wrecked on the Corbière Rocks off the coast of Jersey, has come to a termination without any result. It will be recollected that the inquiry took place before Mr. Bernard and Captain Engledue (magistrates), and Captain Harris, nautical assessor for the Board of Trade. The inquiry occupied three days, viz., the 12th, 13th, and 15th of the present month; and a number of witnesses were examined, comprising the captain and officers of the ship, and several of the passengers who were on board at the time the ship was run ashore. The course selected by the captain (Mabb) of the *Express*, at the time she struck on the rocks, was a narrow channel known as the St. Jaileur's passage, by which fifteen minutes were saved, and the evidence relative thereto was of a most contradictory character, one set of witnesses affirming that the *Express* passed on the port side, and others stated that she passed on the starboard side of a rock named the Frouquis. Under these circumstances the magistrates could not decide upon the case, and the court was adjourned in order that the evidence might be laid before the Board of Trade for their decision.

On the re-assembling of the Court,

The chairman (Mr. Bernard) said,—I was in hopes that the Board of Trade would have pointed out some course which we might have taken to enable us to come to an agreement, but this they have not done, and the magistrates are still of different opinions. Under these circumstances it is difficult to know what to do; but I have drawn out a report which I shall send to the Board. I cannot do otherwise than return Captain Mabb his certificate without expressing any opinion upon the case. I have no power to retain it.

The certificate was then returned to the captain, and the inquiry terminated.

THE SCHOOL FRIGATE CONWAY AT LIVERPOOL.—Captain C. H. E. Judkins, commanding the British and North American Royal Mail Company's steamship *Persia*, received on his last voyage home from his passengers (including Mr. Henry Christy, of London, who gave the liberal donation of £50), and a number of American friends, the sum of £90, to be applied for the purposes of a school frigate. Although the *Conway* has only been open for the reception of lads since the 1st

of August last, there are now being educated and trained on board her more than fifty, a number of whom are the sons of commanders of ships belonging to Liverpool, and others the orphan children of late commanders. The object of the institution is to train a thoroughly respectable class of lads for sea, giving them at the same time a sound practical education, and at least one foreign language. It originated among the merchant captains of Liverpool; and when such men as Captain Judkins, commodore of the Cunard fleet, are so impressed with its usefulness, and are as active in its promotion as he has proved himself to be, we have no need, we are assured, to advocate its cause, or to ask all his brother captains, to the best of their ability, to follow his example. A vote of thanks has been unanimously passed to Captain Judkins by the committee of management.

New Books.

MEDELINGEN UIT HET OOST-INDISH-ARCHIEF, *door Mr. L. C. D. Van Dijk, &c.* Amsterdam, J. H. Scheltema, 1859.

GEOGRAPHICAL AND ETHNOGRAPHICAL ELUCIDATIONS *to the Discoveries of Maerten Gerrits Vries, Commander of the Flute Castricum, A.D.* 1643. Amsterdam, Frederick Muller; London, Trubner, 1859.

It is now above a quarter of a century since Navarrete gave to the world the account of the voyages of the early Spanish navigators as they had left them, to remain in the dusty archives of that office over which (in his turn) he presided at Madrid. The measure was a most excellent one; and among its good effects may be reckoned that of showing the island which Columbus first landed on in America, and the whole progress of discovery which he made in his first voyage. Had the letters of Columbus never been published, the world (that is, the careful part of it, for there is a careless part also,) would have continued in doubt between the two theories upholding islands, said to have been discovered by him, neither of which had he beheld. But when we have before us the words of the Navigator himself, his apparently most trivial expressions, as well as his most important decisions, all receive due attention.

It was truly said, that Columbus unlocked the gates of the New World in the West; those of the East in the Old having been long previously unlocked but only fairly opened by modern, indeed we may say recent, treaties. China and Japan, but a few years ago, were still closed to us; and desiring to continue in their exclusive ignorance. That is, the governing authorities always told us to go away, they could do without us, and would never be satisfied till we were gone. Still the old principle has prevailed: man is a social animal; he is not to keep his gifts from his fellows, nor to be inaccessible to them, or to turn a deaf ear to wants which he can supply. Since in the present year of grace this grand principle has been asserted and established, we now turn to the early accounts of navigators, who have long ago discovered distant shores, for the benefit of their experience in the navigation of them. Navarrete has given us those of the Spaniards. Where are those of the Portuguese? a people too among the earliest of voyagers! Let the question remain for the Portuguese to answer! The French have given us theirs in abundance, and at length we are about to receive those of the Dutch.

The two volumes abovementioned are similar in their nature. In the first

we have (in the original Dutch, and it should find a translator,) the first of a series of numbers intended to contain the accounts of two voyages to Australia, for which country the early Dutch navigators had a considerable predilection. There is scarcely a part of the Australian coast which we do not remember to have seen stamped with the name of some Dutch navigator, and our Tasmania, which has just thrown off the name of the celebrated Van Diemen, still justly preserves that of its Dutch discoverer Tasman. There is an interest attached to the proceedings of these hardy old seamen that makes the accounts of their voyages highly desirable; and we therefore welcome these "communications," the first of which is before us, promising the voyages of J. Cartensz in 1623, and J. E. Gonzal in 1756, to the gulf of Carpentaria and among its adjacent islands Timor, Aroe, New Guinea, &c., and which we hope to see followed by others of their countrymen.

The second of the abovementioned volumes is a work that comes still nearer to our wants,—of Australian coasts we have been our own pioneers for the navigator, while the Dutch kept their treasures locked up. The names of Flinders and King have long gained the meed of praise from all navigators, —but from Japan, and everything Japanese, we have been too long utterly excluded, and its very outline on our charts remains to this day a series of speculative configuration. Japan, indeed, may be considered as claiming the earliest attention of the maritime Surveyor, and good charts of its now opened ports and their vicinity, should claim the earliest attention of those civilized nations who are so nearly concerned by that commercial intercourse which is now about being established.

Meanwhile we must be content to avail ourselves of the labours of Kruzenstern, the American Commodore Perry, and those of our own occasional visits, along with the assistance which Von Siebold has contributed, in adding his experience of that country to the early discoveries of the Dutch navigator, Maerten Gerrits Vries, on the coast of Nippon and Jezo.

To the ordinary navigator, whose business is to make the coast, obtain a pilot, and get his ship into harbour at once, the valuable services of Siebold in the work before us will be somewhat superfluous. What this person requires is a few plain directions and concise descriptions; but to the intelligent and inquiring navigator the notes of Siebold illustrative of Vries' discoveries, will be most welcome, and every step in the progress of the Dutch discoverer will be followed with interest. Thus, his allusions to the great warm water stream, the *Kuro Siwo*, and its limits and course, its remarkable temperature, and its *fucus natans*, similar to that found in our Gulf Stream in the Atlantic; the tribe of the Ainocs or Eastern Savages, at perpetual war with the Japanese, and the curious customs of all these people, will form subjects of interest to him,—and would form a valuable source of information to him who is on his way to those distant shores, while the geographical positions and the vocabularies, as well as the numerous hydrographical remarks with which these pages abound, cannot fail to be sources of valuable information.

JOURNAL OF A VOYAGE TO AUSTRALIA, *and Round the World for Magnetical Research. By the Rev. W Scoresby, D.D., F R.S., and Edited by Archibald Smith, Esq.. M.A , F.R.S., &c.* Longman, London, 1859.

The behaviour of the compass, that all important friend of the mariner, under the trying conditions in which the progress of modern ship-building has placed it, may be said to have occasioned the voyage which is recorded in this work. The voyage itself seems to have occupied about 208 days, (between January and August,) and as we are informed by the Editor, was undertaken by that veteran navigator, the late Dr. Scoresby, for the mere purpose of

magnetic experiment,—of establishing or refuting certain theories in that extraordinary subject propounded by men of science, in which the Author himself participated. The voyage of the *Royal Charter* (one of our first rate iron clippers) round the world with Dr. Scoresby, will stand apart from all others as possessing an interest on the ground of "magnetical research," that will be more permanent than the fugitive power on which it treats, if we are to judge from the late reports of the deviation of our leviathan iron steamer, the *Great Eastern*. It is a remarkable and established fact, which is of the utmost importance, that the deviation of the *Great Eastern*, as she lay at Portland, amounted to about twice as much as it now does at Holyhead;—showing that her voyage between the two ports has shaken a considerable portion of the magnetic action of the iron on the compass *out of her*, or has altered its amount. This is at least something new. A change has taken place to a considerable amount (we believe not far from two points!) certainly tending to strengthen the law by which Her Majesty's ships are guided, that of finding it on every opportunity, and will go far to excite mistrust in previously formed tables with the application of magnets.

We content ourselves from want of space with merely recording the appearance of this important volume. The papers of Dr. Scoresby have been prepared for the press by the Editor, and published in a manner which will occasion no regret to Mrs. Scoresby, and although forming a party in the complicated question of induced magnetism, he has stated the case under controversy with fairness and clearness. It is one which will always lend an interest to the work, and for a clear view of the whole history of the subject of deviation, we cannot do better than refer our readers to it, who will moreover see in the narrative of the voyage numerous traits of the pious mind and Christian sentiments of the late veteran navigator.

ROYAL NAVY COMMISSIONED.—*Beagle*, 4, Comdr. E. Hay, 21st September, Portsmouth. *Cockatrice*, gunboat, Lieut. Holder, Devonport, 22nd September. *Encounter*, 14, Capt. R. Dew, Devonport. *Renard*, 4, Comdr. J. Goodenough, Sheerness. *Ringdove*, 6, Comdr. R. G. Craigie, on 27th September at Portsmouth. *Snake*, 4, Comdr. H. Harvey, Portsmouth. *Sphynx*, 6, Comdr. G. F. Day, Portsmouth. *Snap*, 2, Lieut. W. O. Butler, 20th September at Devonport. *Bouncer*, 2, Lieut. A. R. Owen, at Devonport on 30th September. *Ardent*, 3, Comdr. J. E. Parish at Woolwich. *Prometheus*, Comdr. S. S. Skipwith.

EDWARDS' PATENT PRESERVED POTATO.—We have frequently recorded favourable testimony to the excellence of this article, and we now perceive that Captain M'Clintock has addressed a letter to Messrs. F. King and Son, the manufacturers of this article, stating that "it contributed more to the health of his crew during his twenty-seven months' absence than any other article of diet on board, and was greatly relished by the seamen. Some that had been deposited at Beechey Island in 1854 was found quite sound, and not distinguishable from his own supply embarked on board the *Fox* in 1857." The expedition to China should be well supplied with this potato, as dysentery is very fatal on that coast, and the price being only three farthings per pound of cooked potato, expence cannot be any obstacle. We hear a quantity is being shipped for the hospital service; but a daily supply to keep the men *in health* appears to us of most importance.

THE

NAUTICAL MAGAZINE

AND

Naval Chronicle.

DECEMBER, 1859.

Arctic Discovery.

Considering that a general view of all the Arctic Expeditions from England to the North that have been undertaken with the view of discovering a Northern passage into the Pacific Ocean might prove both useful and interesting to the readers of the *Nautical*, we have compiled the following tabulated statement, with its annexed memoranda of some general particulars relating to each expedition. Moreover, now that the subject has passed away, it is fit that it should go in a collected form into the page of history. The information is scattered through a considerable variety of works, to which of late years a large addition of great interest has been made.

Much as the whole object of the North-West passage has cost this country, the record of its progress forms a proud page for England. When time has smoothed away those ugly excrescencies of suffering and sorrow which it presents, there is a fair and pleasing picture to look at, enlivened too with feats of daring and enduring fortitude in hand to hand contention with the dangers of ice and its inhospitable clime.

We might not have been early in the field of geographical discovery in comparison with some southern nations, who were obliged by their positions to pursue it. But our hardy countrymen adopted Arctic discovery pretty early too, and have not parted with it until the reason why it was taken up has been worked out. The ice with which it is choked up prevents the North-West passage from being of

any use to us. The problem has been solved, and Arctic Discovery will now rest undisturbed until some freak of Nature changes the character of arctic regions, and converts those shores that are now lined with thick ribbed ice into those of our temperate regions. But now to our purpose.

Although, strictly speaking, not an Arctic expedition, we have commenced our table with Cabot's voyage, as the first of the kind that was made from our country. The numbers against the ships refer to the notes following the table. H.B., Hudson Bay Company; G., Government; P., Company or Private Funds.

Reigning Sovereign.	Vessels.	Tons.	Commanders.	Sailed.	Where From.	Returned.	By Whom Sent.
Henry VII..	1. Five ships		J. Cabot and sons	—— 1497	Bristol* .	Uncertain.	P.
,, ..	2. Six ships	200	Sebastian Cabot .	May, 1498	,, .	,, .	G. P.
Henry VIII.	3. *Dominus Vobiscum* and another		Uncertain	May, 1527	Thames..	1527.....	P. probably
,, .	4. *Trinitie* ..... *Minion*		John Hore	April, 1536	,, ..	Uncertain.	P.
Edward VI .	5. *Bona Esperanza*	120	Sir H. Willoughby	May, 1553	,, ..	Perished .	P.
	Edward Bonaventure	160	Rich. Chancelor .			1554.....	
	Bona Confidentia	90	Cornel Durfoorth			Perished .	
Mary	6. *Edward Bonaventure*	160	Rich. Chancelor .	—— 1555	,, ..	Lost.....	P.
	Philip & Mary		Uncertain			1557.....	
,, ...	7. *Searchthrift* ..		Stephen Burough	May, 1556	,, ..	1557.....	P.
Elizabeth .	8. *Michael*	30	Martin Frobisher	June, 1576	,, ..	Oct. 1576 .	P.
	Gabriel	35	Uncertain			Sept. 1576.	
	A pynasse		,, ...			Lost.....	
,, ...	9. *Ayde*	180	Martin Frobisher	May, 1577	,, ..	Nov. 1577.	P.
	Michael	300	Uncertain				
	Gabriel	80	Edward Fenton .				
,, ..	10. Fifteen ships ..		Martin Frobisher	May, 1578	Harwich .	Oct 1578 .	G. P.
,, ...	11. *George*.....	Barques	Arthur Pet	May, 1580	,, .	Nov. 1580	P.
	William.....		Charles Jackman			Lost.....	
,, ..	12. Five ships—one the *Squirrel*	10	Sir Hump. Gilbert	June, 1583	Cawsand Bay	Four lost .	G.
,, ...	13. *Sunshine*	50	John Davis	June, 1585	Dartmth.	Sept. 1585.	P.
	Moonshine....	35					
,, ...	14. *Mermaid*	120	,, ...	May, 1586	,, .	Oct. 1586	P.
	Sunshine	50					
	Moonshine....	30					
	North Star ...	10					
,, ..	15. *Elizabeth*		,, ...	May, 1587	,, .	Sept. 1587.	P.
	Sunshine						
	Helena.....						
,, ...	16. *Discovery*	70	Geo. Weymouth .	May, 1602	Thames..	Aug. 1602.	P.
	Godspeed.....	60					
,, ..	17. *Grace*	50	Stephen Bennett	—— 1603			
James I	18. *Hopewell*.....	40	John Knight ...	April, 1606	,, ..	Sept. 1606.	P.
,, ...	19. A small barque		Henry Hudson ..	May, 1607	,, ..	Sept. 1607.	P.
,, ...	20. Same		,, ..	April, 1608	,, ..	Aug. 1608	P.
,, ...	21. *Discovery*	55	,, ..	April, 1610	,, ..	Sept. 1611.	P.
,, ...	22. *Resolution*		Sir Thos. Button.	May, 1612	Uncertain	Sept. 1613.	P.
	Discovery	55	—— Ingram				
,, ...	23. *Patience*		James Hall	—— 1612	Thames..	Sept. 1612.	P.
	Heart's Ease..						
,, ...	24. *Discovery*	55	—— Gibbons....	—— 1614	Uncertain	—— 1614.	P.
,, ...	25. Ten ships		Robert Fotherby.	—— 1614	,,	—— 1614.	P.
,, ...	26. *Richard*	20	,, .	—— 1615	,,	—— 1615	P.

* Supposed, as the Cabots resided at Bristol and, by their patent, were obliged to return thereto.

Reigning Sovereign.		Vessels.	Tons.	Commanders.	Sailed.	Where From	Returned.	By Whom Sent.
James I	27.	*Discovery*	55	Robert Bylot..	April, 1615	Thames..	Sept. 1615.	P.
,, ...	28.	*Discovery*	55	,, ...	Mar. 1616	,, ..	Sept. 1616.	P.
Charles I ..	29.	A ship		—— Hawkbridge	Betwn 1616 and 1631	Uncertain	Uncertain.	Supposed.
,, ...	30.	*Charles*	80	Luke Fox	May, 1631	Thames..	Oct. 1631 .	G.
,, ..	31.	*Maria*	70	Thomas James..	May, 1631	Bristol ..	Oct. 1632 .	P.
Charles II ..	32.	A ship		Zachariah Gillam	Sumr. 1668	Uncertain		G.
,, ..	33.	*Speedwell*		John Wood	May, 1676	Thames..	Lost.....	G. P.
		Prosperous ...	190	William Flawes .			Aug. 1676.	
George I	34.	*Albany*		George Barlow ..	—— 1719	,, ..	Lost.....	H. B.
		Discovery		David Vaughan .				
,, ...	35.	*Whalebone* ...		John Scroggs ...	June, 1722	Churchill.	—— 1722.	H. B.
George II ..	36.	*Furnace*		Chris. Middleton	—— 1741	Thames	—— 1742.	G.
		Discovery		William Moor ..		supposd.		
,, ..	37.	*Dobbs*	180	,, ..	May, 1746	Thames..	Oct. 1747 .	P.
		California	140	Francis Smith ..				
George III..	38.	By land		William Hearne.	—— 1769			
,, ..	39.	*Racehorse*		Hon. C. J. Phipps	June, 1773	,, ..	Sept. 1773.	G.
		Carcass		Skef. Lutwidge ..				
,, ..	40.	*Resolution*		James Cook	July, 1776	,, ..	Oct. 1780 .	G.
		Discovery		Charles Clerke ..	Aug. 1776	Plymouth		
,, ..	41.	*Lion*.....	brig	Rich. Pickersgill	May, 1776	Thames..	Sept. 1777.	G.
,, ..	42.	*Lion*.....		Walter Young ..	Mar. 1777	,, ..	Aug. 1776.	P.
,, ..	43.	By land		Alex. M'Kenzie .	—— 1789			
,, ..	44.	*Beaver*	84	Charles Duncan .	May, 1791	,, ..	—— 1792.	H. B.
,, ..	45.	*Isabella*	382	John Ross	April, 1818	,, ..	Oct. 1818 .	G.
		Alexander	252	Wm. Edw. Parry				
		Dorothea	370	David Buchan ..				
		Trent	250	John Frankiin ..				
,, ..	46.	*Hecla*	375	Wm. Edw. Parry	May, 1819	,, ..	Sept. 1820.	G.
		Griper.....	180	Matthew Liddon.				
,, ..	47.	By land		John Franklin ..	May, 1819		July. 1822.	G.
George IV ..	48.	*Hecla*	375	Wm. Edw. Parry	May, 1821	,, ..	Oct. 1823 .	G.
		Fury	327	George F. Lyon .				
,, ..	49.	*Baffin*	321	W. Scoresby	Mar. 1822	Liverpool	—— 1822	G.
,, ..	50.	*Hecla*	375	Wm. Edw. Parry	May, 1824	Thames..	Oct. 1825 .	G.
		Fury	327	Hn. P. Hoppner.			Lost.....	
,, ..	51.	*Griper*.....	180	George F. Lyon .	June, 1824	,, ..	Nov. 1824.	G.
,, ..	52.	By land		John Franklin ..	Feb., 1825	Liverpool	Sept. 1827.	G.
,, ..	53.	*Blossom*		F. W. Beechey..	May, 1825	Thames..	Oct. 1828 .	G.
,, ..	54.	*Hecla* and boats	375	Wm. Edw. Parry	Mar., 1827	,, ..	Sept. 1827.	G.
,, ..	55.	*Victory*		John Ross	—— 1829	,, ..	Oct. 1833 .	P.
William IV.	56.	Boats		George Back	Feb., 1833	Liverpool		G. P.
,, .	57.	*Terror*.....	307	,, ...	June, 1836	Chatham	Nov. 1837.	G.
,, .	58.	Boats		Dease	Dec. 1836	Red River	Feb. 1840.	H. B.
				Simpson				
Victoria	59.	Boats		John Rae	July, 1846	Churchill.	Sept. 1847.	H. B.
,, ...	60.	*Erebus*	372	John Franklin ..	Mar. 1845	Woolwch	Never	G.
		Terror.....	326	F. R. M. Crozier.				
,, ...	61.	*Plover*.....	213	T. E. L. Moore .	Jan. 1848	Plymouth	See No. 71.	G.
,, ...	62.	Boats		John Richardson.	Mar. 1848	Liverpool	Jan. 1850 .	G.
				John Rae			Oct. 1854	
,, ...	63.	*Enterprise*....	471	James Ross	May, 1848	Woolwch	Nov. 1849	G.
		Investigator ..	450	E. J. Bird				
,, ...	64.	*North Star* ..	501	James Saunders.	May, 1849	,,	Sept. 1850.	G.
,, ..	65.	Boats		W. J. S. Pullen .	July, 1849	Bhering Strait	Oct. 1851 .	G.
				Wm. H. Hooper.				
,, ...	66.	*Enterprise*....	471	R. Collinson	Jan. 1850	Woolwch.	May, 1855.	G.
		Investigator ..	450	R. M'Clure				
,, ...	67.	*Lady Franklin*		William Penny .	April, 1850	Aberdeen	Sept. 1851.	P.
		Sophia.....		Alex. Stewart ...				
,, ...	68.	*Resolute*	424	H. T. Austen ...	May, 1850	Woolwch.	Oct. 1851 .	G.
		Assistance	424	E. Ommanney ..				
		Pioneer	342	Sherard Osborne.				
		Intrepid.....	342	B. Cator.....				
,, ...	69.	*Felix*	100	John Ross	April, 1850	Stanraer.	Sept. 1851.	P.
		Mary	12	George Phillipps.				
,, ...	70.	*Advance*.....	144	E. J. DeHaven..	May, 1850	New York	,,	U.S.G. P
		Rescue.....	91	S. P. Griffin				
,, ...	71.	*Plover*.....	213	R. M'Guire	Jan. 1852	BheringS.	Never	G.

Reigning Sovereign.	Vessels.	Tons.	Commanders.	Sailed.	Where From.	Returned.	By Whom Sent.
Victoria	72. *Prince Albert.*	89	C. C. Forsyth ...	June, 1850	Aberdeen	Oct. 1850 .	P.
„	73. *Prince Albert.*	89	W. Kennedy....	May, 1851	„	Oct. 1852 .	P.
„	74. *Assistance*	424	Edward Belcher.	April, 1852	Woolwch	Never	G.
	Resolute	424	H. Kellett			Dec. 1856 .	
	Pioneer	342	Sherard Osborne.			Never	
	Intrepid	342	F. L. M. Clintock			Never	
	North Star ...	501	W. J. S. Pullen .		Sheerness	Oct. 1854 .	
„	75. *Isabel*	149	E. A. Inglefield .	July, 1852	Peterhead	Nov. 1852.	P.
„	76. *Advance*	146	E. K. Kane	May, 1853	New York	Oct. 1855 .	U.S. G.
„	77. *Phœnix*	809	E. A. Inglefield .	May, 1853	Sheerness	Oct. 1853 .	G.
	Bredalbane ...						
„	78. *Rattlesnake* ..	508	H. Trollope	Feb. 1853	Plymouth	Dec. 1855.	G.
„	79. *Phœnix*	809	E. A. Inglefield .	May, 1854	Woolwch	Sept. 1854.	G.
	Talbot.....		R. Jenkins.....				
„	80. Boats		J. Anderson	Jan. 1855	Fort Re-	Sept. 1855.	H. B.
			J. G. Stewart ...		solution		
„	81. *Fox*	300	F. L. M'Clintock	July, 1857	Aberdeen	Sept. 1859.	P.

1. JOHN CABOT, and his three sons, Lewis, Sebastian, and Sanchez, were empowered by a patent, in 1495, to sail under the royal flag, to make discoveries in the eastern, western, and northern seas. The account of it is vague and indeterminate, but that Newfoundland was discovered is evident from the following passage, in Latin, extracted from a chart drawn by Sebastian Cabot, and quoted by Hackluyt.

"In the year of our Lord 1497, John Cabot, a Venetian, and his son Sebastian, discovered that country, which no one before his time had ventured to approach, on the 24th June, about five o'clock in the morning. He called the land 'Terra Prima Vista,' because, as I conjecture, this was the place that first met his eyes in looking from the sea. On the contrary, the island which lies opposite the land he called the island of St. John, as I suppose, because it was discovered on the festival of St. John the Baptist. The inhabitants wear beasts' skins and the intestines of animals for clothing, esteeming them as highly as we do our most precious garments. In war, their weapons are the bow and arrow, spears, darts, slings, and wooden clubs. The country is sterile and uncultivated, producing no fruit; from which circumstance it happens that it is crowded with white bears and stags of an unusual height and size. It yields plenty of fish, and these are very large, such as seals and salmon; and there are soles above an ell in length, but especially great abundance of that kind of fish called in the vulgar tongue baccalaos. In the same island also breed hawks, so black in their colour that they wonderfully resemble ravens, besides which there are partridges and eagles of dark plumage."

2. SEBASTIAN CABOT.—These six ships are stated to have been about 200 tons burden, and two of them fitted at the king's expense. The first land seen was "Prima Vista," (Newfoundland,) and the part supposed to have been seen is now Cape Bona Vista. From thence it is stated that they sailed to the southward, to about the latitude of the Chesapeake, and returned home.

3. THE DOMINUS VOBISCUM and ANOTHER.—Of these two ships

very little appears to be known. They were sent out at the instance of "Master Robert Thorne of Bristol." One of them was lost between Newfoundland and Labrador. The other shaped her course for Cape Breton, and explored the coast, the crew frequently landing. This vessel afterwards returned safely to England.

4. TRINITIE and MINION.—This voyage is little better known than the preceding. It was "set forth by Master Hore of London, a man of goodly stature, and of great courage, and given to the study of cosmography." The ships arrived at Cape Breton, and named Penguin Island, on the South coast of Newfoundland. They afterwards put into Newfoundland, and appear to have been reduced by want of provisions to the dreadful resource of casting lots for who should become food for the rest. Happily a French ship arrived, and they seized her, and found their way home in her. It is related of this expedition that "one came behind another, who was digging roots from the earth, and killed him, with a view to prepare himself a meal from his fellow-creature's flesh."

5. SIR HUGH WILLOUGHBY.—Sebastian Cabot, supposed to be the son of John Cabot, after having made discoveries in the service of Spain, during the remainder of Henry the Seventh's reign and that of Henry the Eighth, returned to England in 1548, and was appointed *Grand Pilot* of England, with a salary of £166 13s. 4d., "in consideration of the good and acceptable service done, and to be done, by him." He was placed at the head of an association of merchants, whose object was to make discoveries of unknown countries, for the purposes of trade; and Sir Hugh Willoughby was sent out by them, owing to the representations of Cabot, who endeavoured to prove that it was possible to find a way by the N.E. to Kathay (China) and India. The island of Seynam was seen in this voyage, and the ship passed round the North Cape to Nova Zembla. The *Edward Bonaventure*, which had separated from the Admiral in a storm, went to Archangel, and Captain Chancelor visited Moscow, and returned the following year. Willoughby and Durfoorth, with their crews, are supposed to have perished in a harbour called Arzina, in Lapland, between Kola and Swjatoi Noss.

6. RICHARD CHANCELOR.—The company, encouraged by the reception of Chancelor at Moscow, sent him again to trade, and plenipotentiaries accompanied him from the coast. He went to Archangel with the two ships. Chancelor, in the *Bonaventure*, departed from Archangel for England in July, accompanied by the *Philip and Mary*, the *Bona Esperanza*, and the *Confidentia*, the two latter being the ships of Willoughby. The *Confidentia* was lost on the coast of Norway, with her crew; the *Bona Esperanza* wintered at Drontheim, and was lost on her way home; and the *Edward Bonaventure* was wrecked on the coast of Scotland. Richard Chancelor and most of the crew were drowned, but the ambassador he brought arrived safely in London.

7. STEPHEN BUROUGH,—in the *Searchthrift* (pinnace) went to the coast of Norway, passed the North Cape to Cola, and reached Nova

Zembla; wintered at Colmagore, and on his return was made Comptroller of the Navy.

8. MARTIN FROBISHER,—saw, first, the southernmost cape of Greenland. He discovered land, called since, Meta Incognita. On landing a native, the crew of the boat, consisting of five men, went to the natives, contrary to orders, and were never heard of more; on this account Frobisher caused a native to be seized and taken on board his ship. This man was brought to England, but died soon after his arrival. Some particulars concerning this voyage will be found in our 18th number; among them, a statement of all the expences attending the "strange man of Cathay," including even his picture, painted by a "Ducheman for the Queene's Majestye." A list of the instruments will also be found there that were taken out by Frobisher.

9. MARTIN FROBISHER.—In this voyage Frobisher appears to have first followed his former track from the Orkneys till he came to Frobisher Strait. He then went to the place where he had lost his men in the preceding year, and found their clothes. He and his crew had skirmishes with the natives, and brought home a man, woman, and child. No further discovery was attempted, and they returned with ore, as in the previous voyage, that was supposed to contain gold.

10. MARTIN FROBISHER.—This expedition of fifteen small vessels, was fitted out with the view of collectiug the ore, specimens of which had been brought home from the newly discovered land, called, by desire of Queen Elizabeth, *Meta Incognita*, North of Hudson Strait, although some writers supposed it to have been Greenland.* The persons embarked consisted of forty seamen, thirty pioneers, and thirty soldiers, among which were bakers, gold refiners, &c. They passed up Frobisher Strait. The object of the exhibition was not accomplished; and the vessels, excepting one, returned the same year, having lost forty men.

11. ARTHUR PET.—The ill-success to the westward was the occasion of this trial to the eastward to find a way to Cathay. The vessels passed the North Cape, and penetrated as far as Waygatz Strait, Nova Zembla, but did not pass through it. Pet's ship got safe back to Ratcliff, (Thames,) and the *William*, being separated from her in a fog, wintered in a harbour in Norway, from whence she sailed in February with a Danish ship for Iceland, and was never heard of more.

12.—SIR HUMPHREY GILBERT.—This voyage is full of interest, from the circumstance of Newfoundland being taken possession of, the discovery that was made by it, and the fatal events by which it was attended. The ships arrived at Penguin (now Fogo) Island, and went on to Conception Bay, and afterwards to St. John Bay. Sir Humphrey Gilbert took possession of Newfoundland, and received presents from all the vessels he found there, particularly those of the Portuguese. Mutiny and sickness broke out in his fleet, while in St.

* See a paper on this subject in the Geogr. Soc. Trans., Vol. XII.

John Bay, by which many were lost. He sailed in search of Sablon (Sable) Island, on which he was told that the Portuguese had landed cattle thirty years previously. His ship struck on a sand bank, (probably off Sable Island,) and several of her crew were lost. The admiral was saved, and went on board a small vessel of his fleet, (the *Squirrel* of 10 tons!) and shaped his course for England. But, having passed the Azores in September, they were overtaken by a storm; and the small vessel in which the admiral had embarked foundered, with all on board. Mr. Barrow in his valuable *Chronological History of Voyages into the Arctic Regions*, quotes the following passage concerning Sir Humphrey Gilbert from Prince's *Worthies of Devon*. "He was an excellent hydrographer, and no less skilful mathematician; of an high and daring spirit, though not equally favoured of fortune; yet the large volume of his virtues may be read in his noble enterprises; the great design whereof was to discover the remote countries of America, and to bring off those savages from their diabolical superstitions to the embracing the gospel of our Lord and Saviour Christ; for which his zeal deserves an eternal remembrance." The day before his vessel foundered, she having recovered from being nearly overwhelmed by a great sea, Sir Humphrey was seen sitting abaft, with a book in his hand, and was heard calling out to his crew, "Courage, my lads! we are as near to heaven by sea as by land?"

13. JOHN DAVIS.—The first land made by Davis was named the "Land of Desolation," probably Desolation Island in the chart. Exeter Sound, Mount Raleigh, Dyer Cape, and Cape Walsingham, were successively named on the coast of West Greenland, the latter after the secretary of state, Sir Francis Walsingham. He sailed up the strait bearing his name, but the wind being unfavourable he returned to Desolation Island, and afterwards got safe home to Dartmouth.

14. JOHN DAVIS.—On his second voyage Davis passed Cape Farewell into Davis Strait. He met with the natives at Good Haab, and in consequence of their repeated thefts Davis seized the ringleader and carried him off. He went to Cumberland Strait, and afterwards to Nain, on the coast of Labrador, from whence he returned to England. Two of the four ships were to seek the passage between Greenland and Iceland. They touched at Iceland, and, crossing over to the coast of Greenland, stood to the southward, passed Cape Farewell and Desolation Island, to Gilbert Sound, which Davis had appointed as the rendezvous. Finding him gone, they sailed for England soon after, and arrived at Ratcliff.

15. JOHN DAVIS.—The third voyage of Davis proved to be the most important of all that he made. He proceeded to West Greenland, and leaving two of the ships in 64° N. to fish, he pursued his course to the North and N.W., and arrived off Disko Island. Continuing to the North he named the West coast of Greenland, London Coast, and penetrated as far as 72° 12′ N. Northerly winds obliged him to return to the South; he descried Mount Raleigh in Cumber-

land Island, and named Lumley Inlet after Lord Lumley, Warwick Foreland, Cape Chidley, Darcy Island after Lord Darcy, and returned to Dartmouth.

16. GEORGE WEYMOUTH.—The voyage of Captain G. Weymouth appears to have been determined on in compliance with the general opinion which prevailed of there being a passage to the northward, and the sanguine ideas of the merchants composing the Russian and Turkish company, were considerably influenced by the report of Capt. James Lancaster, who had then returned from a voyage to India by the South. The two ships went round by the Orkneys, and saw the South coast of Greenland; passing Warwick Foreland, they came to Lumley Inlet, and penetrated to the northward as far as 68° 55′ N. There the crew mutinied, but were quieted. Captain Weymouth then stood to the southward, and put into an inlet on the coast of Labrador in 56° N. From thence he returned to Dartmouth without making any discovery.

17. STEPHEN BENNET.—This expedition was sent out at the sole expense of "the worshipful Francis Cherie." The island which bears his name, in 74° 55′ N., was seen in this voyage, but had been previously discovered by Barentz, the Dutch navigator. Besides, the several other trading voyages were made under the patronage of private individuals to Cherie Island and the coast of Lapland, without being productive of any further discovery.

18. JOHN KNIGHT—had performed a voyage before to the North, in the year 1605, by the appointment of the King of Denmark, as the English mariners were considered the most experienced. Knight in the present voyage passed the Orkneys and "came to land" in 56½° N. An accident happened there, by which his ship was driven on shore and became full of water. After doing all they could to stop the leak, he went in his boat in search of a harbour in which to repair her. Leaving two men in the boat, he went with his brother and two others to examine the island on which they had landed. They waited in vain for his return, for they were never heard of more. The crew did all they could to repair their ship and set up their pinnace, but they were driven away by the natives, and obliged to put to sea, their ship leaky, and the new pinnace neither caulked nor payed. They arrived safely at Newfoundland, from whence they returned to Dartmouth. The land they touched at must have been the coast of Labrador.

19. HENRY HUDSON.—Although several voyages had been performed to India by the English, the hopes of getting there by the North were not yet abandoned. Henry Hudson, an experienced seaman, was considered to possess the resolution that was thought only necessary to make it. He reached the coast of Greenland in 73° N., and named an opening "Hold with Hope." He had entertained the idea of Greenland being an island, and attempted to sail round it. He landed his mate and boatswain in 80° 23′ N., on the coast of Greenland. He penetrated to 82° N., but could get no further on

account of the ice, and returned to "Hold with Hope." It was his wish to have passed through this into Davis Strait and return home, but the ice prevented him; after which he reached Gravesend.

20. HENRY HUDSON.—The second voyage of Hudson was directed to the passage between Nova Zembla and Spitzbergen. He reached Nova Zembla, but returned uusuccessful.

21. HENRY HUDSON.—In the year 1609, Hudson had made a voyage to America, in the service of the Dutch, and had discovered Hudson River. Released from his engagements with them, he entered again the service of the English company. It is related of Hudson in this voyage that his employers put on board his ship one Coleburne, in whose skill they had great confidence. This excited Hudson's jealousy, and when on his way down the river he deliberetely landed this person at Lee, with a letter informing the proprietors of his reasons for so doing; which, no doubt, much annoyed them. Hudson passed the Orkneys and Fero Islands, Greenland and Desolation. He named the islands of God's Mercy in 62° N., and Good Fortune, and saw the northern part of the coast of Labrador, which he named Magna Britannica. He also named Salisbury Foreland, Cape Diggs, and Cape Wolstenholme. He passed through the strait formed by those capes, and observed a wide sea to the westward, now Hudson Bay. Hudson's narrative here terminates. The rest of this voyage is supplied by a seaman. They sailed to the southward, with the land on the left hand, and penetrated to 53°, where they had the land on each side of them. Hereabouts Hudson found himself beset by the ice, and obliged to lay up for the winter. They had only taken six months' provisions, and a series of dissensions and mutiny broke out. They were reduced to great privation, being compelled to subsist on moss and frogs, and the buds of spruce fir, with whatever fish and birds they could kill; several died in consequence. On the opening of the next season, as they were leaving their winter quarters, the crew again mutinied, and put Hudson, with his son (a boy) and seven others, into the sloop, with a gun and a scanty supply of provisions, aud left them to their fate. The ship reached the strait, taking birds and moss where they could. They were afterwards attacked by the natives, who killed four of them; but they succeeded in getting clear of the strait. They made for Newfoundland, but, after the severest suffering from want of provisions, they reached Ireland, where they obtained some with much difficulty, and finally arrived at Gravesend. The southern and eastern shores of Hudson Bay were thus discovered.

22. SIR THOMAS BUTTON.—The command of these two ships was given to Captain, afterwards Sir Thomas, Button, and the voyage was partly undertaken with the view of discovering Hudson and his companions, who had been left by the mutineers. The ships entered Hudson Strait and passed Diggs Island, and afterwards named an island further West, which they called Carey's Swan's Nest. They wintered in Port Nelson, in latitude 57° 10′ N., so called after the first mate of the *Resolution*. Mansfield Islands were named the fol-

lowing season, and Button Bay, probably Hudson Bay, the western coast being named New Wales. Without finding Hudson and his companions or effecting any particular discovery, they returned to England.

23. JAMES HALL—had already been to the North in the Danish service, but his present voyage, which was his fourth, was as unfortunate as that of Knight. He reached the coast of Greenland in 65° 20′ N., where in July he was killed by the spear of a Greenlander. One of the crew was also killed afterwards; but there is no doubt that the atrocities committed by the early discoverers was the cause of this hostile disposition evinced by the natives. Without visiting any other land, the ships returned safely to Kingston-upon-Hull.

24. GIBBONS.—Having entered Hudson Strait, Gibbons was driven back by ice into Nain on the coast of Labrador, called in derision by his crew, "Gibbons his Hole," where he was detained five months. The season being too far advanced when he escaped from it, he returned direct to England.

25. ROBERT FOTHERBY—was accompanied by William Baffin, made for Spitzbergen, and arrived at Red Beach on the N.E. point of it. They afterwards made an unsuccessful attempt to get to the North of Spitzbergen, and returned to England. Baffin, as a pilot, had made voyages to the North in the two preceding years.

26. ROBERT FOTHERBY.—The *Richard*, in which Fotherby again went out, accompanied by Baffin, was a pinnace, but he did not attain a higher latitude than in the preceding year; and the Russia Company did not make any further attempts at discovery in the North.

27. ROBERT BYLOT,—who had been three successive voyages to the North under Hudson, Button, and Gibbons, was accompanied by Baffin in the same ship, *Discovery*, which had made three former voyages. He arrived at Resolution Island, and the Salvage (Savage) Islands in 62° N. He afterwards saw Salisbury Island, and named the Mill Isles in 64° N. He named Cape Comfort in 65° N., the highest northern latitude that he attained. He returned to Salisbury and Nottingham Islands, and sailed from Diggs Island for Plymouth, where he arrived in safety.

28. ROBERT BYLOT.—In this interesting and important voyage, by which the northern shores of Baffin Bay were discovered, William Baffin served as pilot, having also served as mate of the same ship in preceding voyages. The company by which the *Discovery* was sent out, consisted of Sir Thomas Smith, Sir Dudley Diggs, Mr. John Wolstenholme, and Mr. Alderman Jones. The first land seen was in 65° N. in Davis Strait. Women Isles were named from the voyagers meeting so many women. Horn Sound, from horns brought to the voyagers by the natives. Cape Dudley Diggs was named, and Wolstenholme Sound,—Whale Sound, from the number of whales found in it. Hackluyt Island, Sir Thomas Smith Sound, Carey Islands, Alderman Jones Sound, James Lancaster Sound, were successively discovered. The ship continued to the southward along the ice, on the West shore of Baffin Bay to Cumberland Straits; crossed over to

Cocking Sound, 65°, in Greenland, and afterwards returned to Dover Roads.

29. HAWKRIDGE—entered Lumley Inlet, Salisbury Islands, Diggs Island, Mansfield Island, Resolution Islands, and afterwards returned home; but there is much uncertainty about the whole voyage.

30. LUKE FOX.—The ship for this voyage was equipped by command of the King, under the direction of Sir Thomas Roe, Sir John Wolstenholme, and the Trinity House. Mr. Barrow says of Fox that "he was a keen shrewd Yorkshireman, and evidently a man of considerable talent, but conceited beyond measure; and the style of his journal is so uncouth, and the jargon so obscure and comical, as in many places to be scarcely intelligible." He had facetiously assumed the name of the "North-West Fox," and commences his journal thus,—"Gentle reader, expect not heere any florishing phrases or eloquent tearmes; for this child of mine, begot in the North-West's cold clime, (where they breed no schollers,) is not able to digest the sweet milke of Rethorick," &c. He passed the Orkneys, Cape Farewell, Lumley Island, (now Marble Island,) Dun Fox Island, a group of islands called Brigg's Mathematics, King Charles Promontory. A promontory called Fox's Furthest, on the West side of Fox Channel, was seen, after which he returned to the Downs.

31. THOMAS JAMES,—in the *Maria*, passed Cape Farewell, Resolution Island, Hudson Straits. He met Fox near Port Nelson. His ship at the end of the season was run aground on Charleton Island, where they wintered, and suffered much from the scurvy. By the end of the following summer they contrived to get the ship home, and arrived at Bristol. James appears not to have been qualified for this voyage.

32. ZACHARIAH GILLAM—went out under the immediate patronage of Count Rupert. It is stated that he stood into Davis Strait as far as 75° N., and then into Hudson Bay, and entered Rupert River at its southern extreme. Fort Charles was first built here by him, and the country called Rupert Land.

Previous to the conclusion of this voyage, King Charles the Second granted to Prince Rupert, and to "divers Lords, Knights, and Merchants," a charter, dated the 2nd of May, 1669, by which his Majesty styled them, "The Governor and Company of Adventurers trading from England to Hudson's Bay." Hence the origin of the Hudson Bay Company.

33. The *Speedwell*, JOHN WOOD.—was accompanied by the *Pink Prosperous*, which was purchased by the Duke of York and Lord Berkley, Sir Joseph Williamson, Sir John Banks, and some gentlemen to effect a passage to China between Spitzbergen and Nova Zembla. The land they saw was the North cape of Lapland, afterwards Nova Zembla, where Captain Wood's ship was lost in the ice, in June. Point Speedwell, in Nova Zembla, was named after her. Having saved all they could, they returned to England in the *Prosperous*, and arrived at the Nore.

34. GEORGE BARLOW and VAUGHAN—were sent out by the Hud-

son Bay Company, under the orders of Captain James Knight, to find the straits of Anian; but nothing is known of them, as they never returned.

35. JOHN SCROGGS—was sent in a small sloop by the Hudson Bay Company to search for Knight amd Barlow. He saw Cape Fullerton. It was stated that he entered Sir Thomas Rowe's Welcome, but he was supposed only to have reached Marble Island, and returned unsuccessful to England. He reached the parallel of 62° 30′, where he found some islands, probably in the North part of Hudson Bay.

36. CHRISTOPHER MIDDLETON.—The *Furnace* and *Discovery*, under the command of Captain Christopher Middleton, passed the first winter at Churchill, from whence they sailed in July, 1742. The land he saw was Marble Island: and passing through the "Welcome," he entered the inlet to the West, which he called Wager River, after Sir Charles Wager, and which he explored. He named Savage Sound and Dear Sound, in Wager River; Cape Hope; explored Repulse Bay; and returned to southward by Cape Dobbs and Marble Island, and thence to England. Captain Middleton, after his return from this voyage, was accused by a Mr. Dobbs, at whose instance he had performed it, on the faith of an anonymous letter, of having stifled the discovery of the North-West passage, thereby furthering the interests of the Hudson Bay Company at the expense of Government. Middleton did all he could to refute the charge, but did not succeed even with the Lords of the Admiralty; and in the following year (1743) an act of parliament was passed offering the reward of £20,000 to any person, being a subject of his Majesty, who should discover a North-West passage through Hudson Strait to the western and northern ocean of America. How completely has time proved that Middleton was an injured man!

37. WILLIAM MOOR.—The *California* and *Dobbs* galley, under the command of Mr. Francis Smith, were equipped by a company at the instance of a Mr. Dobbs. Saw Marble Island; wintered at Port Nelson, and fitted their long boat, naming it the *Resolution*. They proceeded on in July, 1747, and looked into Chesterfield Inlet and Wager Water, and returned to Yarmouth Roads.

38. In the year 1769, Mr. Samuel Hearne was sent by the Hudson Bay Company to make discoveries to the North, in America, by land. He set out in November of that year, and in the following reached Coppermine River, which he traced to the sea.

39. HON. JOHN PHIPPS.—The *Racehorse* and *Carcass*, the former under the command of Captain the Hon. Constantine John Phipps, afterwards Lord Mulgrave, were sent out by Government, at the request of the Royal Society, while Captain Cook was absent on one of his voyages. They proceeded to the East of Spitzbergen, and attained the lat. of 80° 48′; from thence to Nova Zembla, and soon arrived at Waygat Strait. They then endeavoured to penetrate to the westward, but, being stopped by the ice, returned home.

40. COOK.—We now arrive at the memorable voyage which deprived England of her great and justly admired circumnavigator. It

is remarkable, also, that Captain Clerke, who accompanied him in the same voyage, in the command of the *Discovery*, died after he had succeeded him as the chief of the expedition. Forster relates the following anecdote of this officer:—"Clerke, a man of a noble disinterested spirit, had been security for the debts of his brother, Sir John Clerke, at the time that he went on board a king's ship to the East Indies. He having died in India, his creditors would have come upon Captain Charles Clerke for payment. Some people of rank, who wished him well, advised him to go into the King's Bench, as the sum that Sir John owed was pretty considerable, and much more than his brother Charles was able to pay. An act of grace, which came out soon after, set many thousands of prisoners at liberty; and, amongst others, Captain Clerke regained his freedom towards the end of July, and set sail in the *Discovery* from Plymouth."

Respecting the premium for the discovery of the North-West passage, the late Sir John Barrow observes,—"It has been mentioned, that a reward of £20,000 was held out to the ships belonging to any of his Majesty's subjects which should make the passage; but it excluded his Majesty's own ships: the reward was, moreover, confined to such ships as should discover a passage through Hudson's Bay. This act was, therefore, on the present occasion amended, and so framed as to include his Majesty's ships, and to appropriate the reward for the discovery of 'any northern passage' for vessels by sea, between the Atlantic and Pacific Oceans; and it also awards the sum of five thousand pounds to any ship that shall approach to within one degree of the North pole."

The vessels visited Table Bay, Van Diemen Land, New Zealand, the Friendly Islands, Otaheite, Turtle Island, Nootka Sound, in 49½° N., from whence they commenced exploring their way to Bhering Strait. The West coast of America was passed from thence to Prince William Sound, Cook Inlet, Oonalashka, and the coast of America to the northward; they then crossed to the coast of Asia in 66½° N. The northernmost extent that Cook reached on the coast of America was lat. 70° 45′ N., and the cape he saw received the name of Icy Cape. From thence, after again crossing to the Asiatic coast, he returned to the Sandwich Islands, where he met his untimely end. The command of the expedition having devolved on Captain Clerke, he proceeded to Bhering Strait in the following season, and was prevented by the ice from penetrating so far as the ships had been under Captain Cook. Having determined to put into the harbour of St. Peter and St. Paul, in Kamtschatka, he died in sight of the entrance, in the thirty-eighth year of his age. The command of the expedition now devolved on Lieutenant Gore. On their way home they touched at Macao, Simon Bay, the Orkneys, and arrived in England, after an absence of four years, two months, and twenty-two days.

41. R. PICKERSGILL—was sent to penetrate to the North-West by Davis Strait. He ranged along the coast of Greenland and Muskito Cove. The furthest North latitude he attained was 68° 14′ in Davis

Strait; after which, he stood to the southward, to the coast of Labrador, and returned to England.

42. WALTER YOUNG,—who succeeded Pickersgill in the command of the *Lion*, was sent out to explore the western shore of Baffin Bay; and if he should discover an outlet to the westward affording any probability of a passage to the Parific, his orders directed him to attempt it. He succeeded in reaching the latitude of 72° 42′ in Baffin Bay, but returned to the Nore without having made any discovery.

43. In the year 1789, Mr. ALEXANDER M'KENZIE departed from the Lake of the Hills, in North America, with the view of penetrating to the polar sea. He passed down the M'Kenzie River to Whale Island, which he placed in lat. 69° 14′, and which was afterwards corroborated by Franklin.

44. CHARLES DUNCAN,—a master in the Royal Navy,—has added his name to the list of polar voyagers, in conducting an enterprise as little productive of the desired object as any of his predecessors. He encountered much ice in Hudson Strait, and only reached Charles Island in August. He wintered at Churchill, in Hudson Bay, and in July of the following year entered Chesterfield Inlet, where his crew mutinied, and the voyage was afterwards abandoned.

45. JOHN ROSS.—The first expedition of Captain Ross (the late Sir John) was certainly made on a grander scale than any other that had gone before it. Not only were the ships employed in it larger, but they were fitted in a manner "as strong as wood and iron could make them," and were supplied with a plentiful stock of instruments such as the advanced state of science demanded, with "divers cunning men," as old Hackluyt would have expressed it, to use them. This expedition had two objects,—one, the North-West passage, to be attempted by the *Isabella* and *Alexander;* the other, the voyage across the pole, to be attempted by the *Dorothea* and *Trent:* the four ships to find their way through Bhering Strait. No pains nor expence were spared in their equipments, and most sanguine were the expectations of the result. The *Isabella* and *Alexander* passed Cape Farewell in May, and in August they had penetrated to latitude 75° in Baffin Bay, where, of course, a vast quantity of ice was found. The northern shores of Baffin Bay were passed as near as the ice would permit; and the description of that able navigator (who, it will have been seen, accompanied Bylot) was concluded to be as nearly correct as could have been expected. Still, however, they were not explored; and it was the opinion of experienced men, that channels would yet be found leading out of Baffin Bay, at its northern extreme. Captain Ross, being satisfied that no outlet could be found through Lancaster Sound, passed down the western shore of Baffin Bay and returned to England.

The *Dorothea* and *Trent* made direct for Spitzbergen, and were much beset by the ice on the shores of that island. In July, they penetrated as far as 80° 32′, but were driven by a violent gale to seek shelter in the harbour of Smeerenburgh. The *Dorothea* was so much

injured by the ice, that it was with much difficulty she reached it. In October following they returned to England.

46. William Edward Parry (the late Sir Edward).—The foregoing expedition may be considered to have been the first of that recent series of polar voyages which have contributed so much to our knowledge of that part of the globe; and this, commanded by Lieutenant Parry, as is well known, was the immediate consequence of it. The *Hecla* and *Griper* passed up Davis Strait, and were in Lancaster Sound by the end of July. On the 3rd of August, the ships, having been detained by a foul wind, penetrated through the sound to the westward, and discovered the strait which is justly distinguished by the name of Barrow, one of the late secretaries to the Admiralty, to whom the science of geography stands deeply indebted. The shores on either hand as far as Melville Island in 110° W. long., were discovered and named in this voyage, and the ships by the commencement of September had gained to the westward of it. The ice forming round them obliged Lieutenant Parry to seek a harbour in Melville Island, in which to pass the winter. The islands on the North, among which was Melville Island, were called the North Georgian Islands. The month of August had arrived before the ships could be moved from their winter's position, when they returned to England by the same route they had so successfully adopted.

47. In connection with the foregoing expedition of Lieutenant Parry, a journey by land was performed by Lieutenant Franklin, (the late Sir John,) which, in point of severe and protracted suffering, has not been surpassed either before or since. In May, 1820, he left England, with Dr. Richardson of the navy, and, descending the Coppermine River, arrived at its mouth in July following. With the view of reaching Repulse Bay, the party proceeded eastward along the coast in light boats which they had with them. The shore of the Arctic Sea between the mouth of that river and Point Turnagain was explored, from whence the party returned to their winter quarters, not without the loss of some of their companions. In a former number we laid before our readers the account of this journey, from the pages of the *Edinburgh Cabinet Library*, a little work signalized among others of the present day by the very able manner in which it is conducted.

48. William Edward Parry.—Commander Parry, (he was made Captain in November, 1820,) in this his third voyage to the polar regions, attempted to penetrate to the westward in a lower latitude than Melville Island, in consideration that the shores from Wager River to the northward not having been closely examined, a passage might be found there. In July the two ships were in Hudson Strait, and in August had reached Fox Channel. Being disappointed in not finding a passage through Repulse Bay, as Middleton had been before them, the navigators succeeded in gaining the northern part of Fox Channel, where they passed the winter. In July following they continued to the northward, and in August reached the strait which was named after their ships, the *Fury* and *Hecla*. A journey on the ice was per-

formed by Commander Parry, who, when he had reached the western extreme, considered the sea to the westward to be the Polar Sea, but which, by the information brought home by Captain Ross, is proved to be no other than the gulf of Boothia, forming the termination of Prince Regent Inlet. By the end of October the ships were safely moored in a harbour at the entrance of this strait, where another winter was passed. It was in the beginning of August before the ships could be moved. Determined to leave nothing undone by which he might succeed in finding a passage to the westward, Commander Parry had meditated leaving one of his ships, after removing the crew from her, and passing another winter in the polar regions. Symptoms of scurvy among his men obliged him to relinquish this plan and to make the best of his way to England, where the two ships arrived in safety. In this expedition the shores of Melville Peninsula were explored by Commander Lyon.

On the 3rd May, 1823, Commander Clavering, in H.M.S. *Griper*, made a voyage to Greenland, Spitzbergen, and Hammerfest, for the purpose of performing some experiments with the pendulum in high latitudes; and although it was highly useful to science was not remarkable for any geographical discovery.

49. Scoresby.—Although not a voyage expressly undertaken with the view of discovery, the extent of coast laid down by Scoresby entitles his voyage to notice here. On the 27th of April the *Baffin* had reached Hackluyt Headland of Spitzbergen, in nearly 80° lat., without having experienced any frost. She was compelled to turn to the southward the next day, having encountered the edge of the ice, notwithstanding that in a former voyage he had reached the lat. of 81° 30′ in. long. 19° E. The coast of Greenland was seen between the latitudes of 74° and 70°, and the various points, bays, and islands were laid down and named by Mr. Scoresby. It must, however, be conceded that this coast had been previously discovered, and was not unknown to the old navigators. Hudson (19) had penetrated even to the latitude of 82°, but owing to the want of some depository for such documents, his charts and observations are lost to us. It is much to be regretted, for the sake of geography, that our ancestors, in their zeal for extending our knowledge of the globe, had not first formed a geographical society, or even a hydrographical office, in which such valuable and important documents might have been preserved to posterity.

50. William Edward Parry.—The plan adopted by Captain Parry in this fourth voyage, was to pass through Barrow Strait and down Prince Regent Inlet, from whence, if possible, to gain the coast of America, and to continue along it to Bhering Strait. By the middle of June the ships had reached Davis Strait, but it was not till September that they could get into Lancaster Sound, and the 28th of that month found them in their winter quarters, named Port Bowen, in Prince Regent Inlet. In July following the ships left Port Bowen to make the grand attempt on which was founded all his hopes. The result was, however, at hand. Having gained the latitude of 72° 43′

and longitude 91° 50′ on the 11th of August, the *Fury* was nipped by the ice, so as to become leaky, and not even seaworthy. The provisions and stores were landed, with the view of repairing the ship; but the damage she had sustained proved to be too severe: and having taken her crew and part of her stores on board the *Hecla*, Captain Parry found himself compelled to abandon her and return to England, where he arrived in safety.

51. George Frederick Lyon.—The voyage of Captain Lyon, in 1824, in the *Griper*, was productive only of disappointment. The first object of the voyage was to gain Repulse Bay. Having passed up Hudson Strait, the *Griper* was nearly lost on Southampton Island; the place was named by Captain Lyon "the Bay of God's Mercy." The *Griper* experienced further bad weather in the Welcome, and being fairly driven from her anchors, made for England. It has been stated that the *Griper* was a vessel but ill calculated for this voyage.

52. A similar journey to that which he had performed before, became again the duty of Commander Franklin. He was also, as before, accompanied by Dr. Richardson, and measures were adopted, by establishing provision posts, to prevent the possibility of a recurrence of those severe hardships which they had endured in their first journey. Provided with boats of a peculiar construction, by Lieut.-Col. Pasley, of the Royal Engineers, they left Liverpool in February, 1825. The party wintered on the banks of the M'Kenzie River, at Fort Franklin, near the great Slave Lake; Commander Franklin having previously employed a short interval between their arrival there and the setting in of the winter in visiting the mouth of this river. In the month of June following they embarked on the M'Kenzie River, and arriving at its mouth, one party, under Commander Franklin, proceeded along the western shore, while another, under Dr. Richardson, directed their course to the eastward. Having reached the meridian of 150° W., in the lat. 70°, and named Point Beechey, Commander Franklin was compelled, on the 18th August, to retrace his way to the M'Kenzie River, in order to secure his arriving at winter-quarters before the season was over. Dr. Richardson and his party, in the mean time, explored the coast between the M'Kenzie and Coppermine Rivers, and both parties met at Fort Franklin in September.

53. Frederick William Beechey.—In connection with the foregoing expeditions was the voyage of Captain Beechey in the *Blossom*. And considering them all as directed to one object, that of settling the question of the North-West passage, while they afford a splendid instance of the exertions of an enlightened nation to ascertain, by well planned and well combined operations, the natural boundaries of sea and land, they are no less remarkable for individual exertion and perseverance than as affording an instance of the uncertainty of human enterprise, and how the best laid plans of man may be rendered abortive. While Commander Franklin was using his best exertions to get to the westward from the M'Kenzie River, casting many an anxious

look to seaward for the ships of Commander Parry, we have seen that an accident lost the *Fury*, one of his ships; and, indeed, that if this had not happened, Ross has since shown us that he never could have got to the westward from Prince Regent Inlet! At the same time that this occurred, the *Blossom* was off Icy Cape, and being unable to proceed further to the East, her barge, under the command of Mr. Elson, her master, was despatched to meet, if possible, Commander Franklin and his party. The very day before the latter turned back to retrace his steps, Mr. Elson departed on his interesting voyage, and having reached Cape Barrow, distant only 146 miles from Point Beechey, was obliged to set out on his return to his ship.

But, although each party may be said to have separately failed in achieving their object, yet the question of a connection by sea between the Atlantic and Pacific Oceans by the North Pole was satisfactorily established; and many miles of sea-coast, before entirely unknown, were delineated on the map.

54. William Edward Parry.—We now arrive at the remarkable attempt of Captain Parry to reach the pole by means of boats from Spitzbergen. They were constructed with thin planks and waterproof canvas, with stout felt between them, by which means they united strength, lightness, and pliability. They were, moreover, supplied with wheels, to be used when crossing the ice. The idea, we believe, originated with Captain Sabine, and the plan certainly required all the energy and firmness of Captain Parry to put it into execution. The Captain proceeded to Spitzbergen with these boats in the *Hecla*, his former ship, calling first at Hammerfest, in Norway, where he took on board eight reindeer to draw the boats. Owing to the state of the ice, it was the 20th of June before he could leave the ship on his perilous expedition. Having secured her in Truerenburg Bay, in Spitzbergen, he took seventy-one days' provisions, and, leaving the reindeer and wheels as useless, in consequence of the state of the ice, he set out on the 22nd of June, to arrive, if possible, at the Pole. It was not long before the party reached a loose mixture, that was neither ice nor water, but which was to be passed. Having the sun in their faces, they soon converted night into day, as, from being lower, the glare was not so powerful. Their progress was slow and most laborious, having to unload the boats frequently to carry them over small floes of ice, which were separated from each other by lanes of water. They were also much annoyed and delayed by the hummocks of ice, and, occasionally, it was so rugged and sharp that their feet suffered considerably. The party continued on their arduous and difficult journey, sleeping by day in their boats, until the 24th of July, at which time it was found that, in consequence of a fresh northerly wind that had been blowing for some days, they were losing ground; and although in the course of three days they had travelled over ten miles to the northward, they found themselves four miles to the South of the place from whence they had started. This circumstance, with the great difficulties they had met with in penetrating so far as they had done, determined Captain Parry to relinquish the attempt to proceed any fur-

ther northward. Great efforts had been latterly made by the party to reach the lat. 83°, but in vain; 82° 45′ being the furthest that they could attain. In returning to the South the same difficulties were experienced, and it was the 21st of August before they rejoined the *Hecla* at Spitzbergen.

55. JOHN ROSS.—The late Admiral Sir John Ross, who had made a previous voyage in command of the *Isabella*, fitted out a small steam-boat, the *Victory*, with the generous assistance of Felix Booth, Esq., and departed with the intention of following up the plan of Captain Parry, by passing down Prince Regent Inlet. An account of this voyage has been already given in a former number. The result of it has proved that Prince Regent Inlet has no outlet to the westward, and that it terminates in the gulf represented in the map, and named Boothia.

56. The continued absence of Sir John Ross on his expedition in the *Victory*, excited alarm for his safety, when an expedition, promoted by the Government and assisted by general subscription, left these shores in February, 1833, to search for him under the direction of Captain, now Admiral Sir George, Back. Sir John Ross was picked up by a whaler in Barrow Strait, and returned to England in the same year, while Sir George Back, accompanied by Dr. King, was exploring his way down the Great Fish River. The result of the expedition was the knowledge gained of this river and Montreal Island at its mouth, along with the adjacent shores, and Sir George Back returned home by way of New York in September, 1835.

57. GEORGE BACK.—In the year 1836 another attempt was made by "the way of Wager River" to trace the northern boundary of the American continent by Captain (now Admiral Sir George) Back, in H.M.S. *Terror*. This vessel passed up Hudson Strait in August, 1836, and left it on her way home in August, 1837, after encountering extraordinary perils from the ice, and a narrow escape from foundering; having been severely nipped by it, and kept on her broadside by a large portion adhering to her bottom. She was compelled to return home in a leaky condition with her sternpost shattered.

58. The boat expedition of Dease and Simpson was equipped by the Hudson Bay Company "for the purpose of endeavouring to complete the discovery and survey of the northern shores of America. It consisted of twelve persons, and started from Red River on the 21st of July, 1836, for the Great Slave Lake, from thence down the Mackenzie River to the sea, reaching Point Barrow on the Arctic shore on the 3rd of August, and on the 25th of that month winter-quarters at Fort Confidence, in the northern angle of the Great Bear Lake. In the spring of 1838 they descended the Coppermine River to the sea, (York Archipelago,) and explored the coast eastward to Point Turnagain, returning to Fort Confidence for another winter by the 14th of September. By the following June they were again going down the Coppermine, and penetrated along the coast East to Back River, visiting Montreal Island; but leaving the eastern part of the strait unexplored

they again wintered at Fort Confidence, and returned to Red River by the winter of 1839-40.

59. Dr. Rae.—Messrs. Dease and Simpson had left a question undetermined of a very interesting nature in arctic discovery when they turned back from their eastern extreme at Castor and Pollux River, (East of Back River,) and it was this, viz.: whether the sea there had any communication with Parry's strait of Fury and Hecla. This was the question which the Hudson Bay Company employed Dr. Rae to decide, and whether the Boothia of Sir John Ross was connected or not with the American continent. He left York (Hudson Bay) on the 13th of June, 1846, and Churchill on the 27th, in boats. Passing to the northward through Repulse Bay, he crossed Rae's Isthmus into Committee Bay, named by him, by the 1st of August, but wintered at Fort Hope, in lat. 66½° N., and 87° W.

On the 5th of April, 1847, Dr. Rae again crossed his isthmus, pursuing his way along the West shore of Committee Bay, reached Pelly Bay, naming Cape Berens, and returned to Fort Hope early in May, —thus solving the question put in his instructions. He again set out in the month of May, and discovered the coast up to Cape Parry, South of the strait of Fury and Hecla, in the gulf of Boothia, returning to York Factory by the beginning of September.

60. Franklin.—Her Majesty's Government having resolved on another attempt at effecting the North-West passage into the Pacific Ocean, the *Erebus* and *Terror* left our shores in the spring of 1845 with this object. The ships never returned, but *their* fate has been ascertained by successive discoveries. It has been found that they wintered at Beechey Island in 1845-46, after having passed up the Wellington Channel to lat. 77° and returned to their winter-quarters by the West of Cornwallis Island, that they proceeded to the South in 1846, and in September of that year were beset in the ice about fifteen miles N.W. of the northern part of King William Island, that Sir John Franklin had died on the 11th of June, 1847, and that in April, 1848, the ships were abandoned by the officers and men on board, amounting to 105, one of the ships foundered afterwards in the ice, and the other drifted on shore. The remains of several have been found, and many relics brought home.

61. *Plover*, T. E. L. Moore.—We now arrive at that period of *Arctic Enterprise* when all our sympathies were naturally excited by the stubborn silence since 1845, which continued to prevail respecting Franklin and his companions; and yet this failed to secure them timely relief! Such was our first great misfortune; for every expedition that was sent with that relief went too late. And yet one of the first expeditions that did go went with orders to explore the very part of the arctic shores where Franklin's ships were fast in the ice. Nor after its return, such was the complicated nature of the possibilities of the ships being here or there, was this again referred to or gone to by others until the last! But had the first relief expedition gone there, relief even then would have been too late! The precious moments were lost:

time had gone by. The severities of the arctic climate had done their the worst on the weakened and famished frames of our adventurous countrymen, and the heroic and most enterprising exertions of our officers and men, as well as our gallant companions of the United States, were mocked by the ice, their real object was defeated, and we had in exchange for Franklin geographical discovery! *quantum valeat!* We do not despise this when enterprise and emulation lead the way to it as the object in view. But what we wanted was Franklin and his party relieved! We have their relics, and that is all as the last but sad enduring scene in the real drama now passed by of Arctic Discovery!

The year 1848 commenced a series of searching expeditions, (Franklin having had provisions to last him until this year) which have only concluded with the past summer, and the first which left our shores was that of the *Plover*, under Commander Moore, for Bhering Strait to relieve Franklin's ships from that direction. Leaving Plymouth early in January, the *Plover* could only find her way by Cape Horn through the Pacific to a winter harbour (1848-49) on the Asiatic coast, called by him Emma Harbour, in October of that year. Captain Moore was actively employed about Bhering Strait, and relinquished the command of the *Plover* to his successor, Captain Maguire, in 1852.

62. JOHN RICHARDSON—with Dr. Rae—left Liverpool on the 25th of March, 1848, and proceeded by New York, Montreal, and the usual lake route to St. Mary and Fort William on Lake Superior, thence by the Red River, the Great Slave Lake, and the Mackenzie River to the sea, where they arrived on the 4th of August with boats prepared for coasting eastward. Having penetrated as far as Capes Kendall and Krusenstern, they repaired to winter-quarters on the 2nd of September, having thus examined the coast between the MacKenzie River and the Duke of York Archipelago, opposite Victoria Land. In the summer of 1849, Sir John returned to England, leaving Dr. Rae to pursue a further examination of the coast eastward.

63. *Enterprise* and *Investigator* left England in May, 1848, as the first searching expedition following the course of Franklin from the eastward. On the 11th of September they entered Port Leopold for the winter, having been to the westward of it in Barrow Strait. In May, 1849, the North and West shores of North Somerset were examined to Cape Bunny, the East shore as far as Fury Beach, (place of her wreck,) Port Bowen, and Mansfield Bay. On the 28th of August, 1849, the ships got clear of Port Leopold, and on the 1st of September, while making for the Wellington Channel, were beset and drifted in the ice to the eastward through Lancaster Sound into Baffin Bay in a dangerous condition. When in the latitude of Cape Graham Moore, they cleared the pack by the 25th of September, from whence Sir James Ross arrived at the Admiralty on the 5th of November.

The failure of this expedition was but the prelude to the same misfortune which attended those of the Government after it, in which so much noble enterprise and exposure produced no other result than

geographical discovery, while far to the South of Cape Bunny, beyond Sir James Ross's furthest point, lay Franklin's ships, having passed down there three years before Sir James Ross. But the tide of misfortune had set in. Every ship, even every searching party, went everywhere but where they were to be found, and disappointment prevailed.

64. NORTH STAR.—In order that Sir James Ross should not be deterred from his search by want of provisions, the *North Star* sailed on the 19th May to land provisions on his ground. Passing up Baffin Bay Mr. Saunders found a wintering harbour near Wolstenholme Sound, in lat. 76° 33′ N. and 68° 56′ W. On the 1st of August of the next year he escaped from his winter retreat, and was in Prince Regent Inlet by the middle of that month, unable to enter any harbour, not even Port Leopold, to land the provisions. But this was eventually done on the South shore of Lancaster Sound, near the Wollaston Islands, by the 28th of August, and by the 28th September, 1850, the *North Star* had returned to England.

65. While these proceedings were going forward nearer home, the boats of the *Herald* (Captain Kellett) and *Plover* were leaving Behring Strait in charge of Lieutenant (now Captain) Pullen and Mr. Hooper (since dead). They left the ships off Wainright Inlet on the 5th July, coasting the Arctic Sea to the Mackenzie, which river they proceeded up, having on their way to it met with some hostile demonstrations from Esquimaux. They reached Fort Simpson, on the Mackenzie, by the 3rd of October, 1849. In July, 1850, on their way up the Mackenzie, they left Fort Hope to explore the coast eastward of the Mackenzie from Cape Bathurst to Banks Land, but returned again to Fort Hope in September unsuccessful, and, again wintering on the Mackenzie, returned to England in September, 1851. Commander Pullen had entertained hopes of getting to the eastward from Banks Land even as far as Cape Bunny of Sir James Ross, but with his equipments was unequal to the task.

66. ENTERPRISE and INVESTIGATOR.—We now arrive at an expedition remarkable for discovery and the extent of coast passed over by two ships, which although forming one expedition were still at liberty to proceed separate. The return of Sir James Ross was but the signal for renewed search as soon as the new year came with its promise of spring and summer. Our table shows more activity still, and the first which left our shores were the above, under the command of Captain Collinson and Commander (now Captain Sir Robert) Maclure. Sailing together from Plymouth, they soon separated, and the *Investigator*, having the good fortune to reach Behring Strait a few days before the *Enterprise*, passed the icy barrier and penetrated along the coast, discovering the southern coast of Banks Land, and wintered in the middle of Maclure Strait in 1850–51. Again the *Investigator*, —Captain Maclure left the strait as early as he could the following season and, after great difficulty and narrow escapes of being crushed, reached Mercy Bay. Here Captain Maclure had to pass the winters of 1851–52 and 1852–53, when, with his crew, he was happily re-

leased by a party from Captain Kellett's ship, and returned home with Sir Edward Belcher's expedition in 1854, leaving the ship in Mercy Bay, it being impossible to move her from the accumulated pressure of the ice from the Polar Sea.

Meanwhile the *Enterprise*, Captain Collinson, having arrived in Behring Strait too late to pass between the ice and the coast, proceeded to Hongkong for the winter 1850–51, and returning in 1851, penetrated to the eastward, wintering in 1851–52 in the S.E. part of Prince Albert Land. As soon as the season permitted, the *Enterprise* in 1852 proceeded eastward, exploring Prince Albert and Wollaston Land, continued on through Dease and Simpson Strait, and found a winter harbour for 1852–53 in Cambridge Bay, in the S.E. part of Victoria Land; from whence Captain Collinson explored the eastern coast of this land to Gateshead Island, which has proved to be immediately opposite the scene of Sir John Franklin's sufferings. The *Enterprise* again wintered at Camden Bay, 1853–54, on the arctic coast West of the Mackenzie, and reached England in May, 1855,—her consort, the *Investigator*, being left in the arctic seas.

Captain Maclure having visited the winter harbour of Parry in Melville Island while his own ship was locked up in Mercy Bay, received the reward for completing the discovery of the N.W. passage, along with the honour of knighthood. Still no vestige of Franklin's ships were found by him, but Captain Collinson had had the good fortune to find some remains of woodwork belonging to a ship, without knowing that he was near the scene of Franklin's disaster. But large expeditions were now at hand, and we must place together the following, all of this year—1850.

67 to 72. Of these the first that left for the seat of enterprise were the *Lady Franklin* and *Sophia*, tender, under the command of Captains Penny and Stewart. The shores of the Wellington Channel were now explored by the *Resolute*, Captain Austen, and *Assistance*, Captain Ommanney, with their steam tenders, the *Pioneer* and *Intrepid*, under the command of Captain Austen. Captain Ommanney, of the *Assistance*, was the first to discover the mass of Franklin relics left at Beechey Island, the first accounts of which were brought home by Captain Forsyth, in the *Prince Albert*, in October of this year. It was now that we first ascertained that Franklin had been at Beechey Island; but how long he was there or whither he had gone the most diligent and repeated search could find no document from which to ascertain. The Wellington Channel, the southern shores of Cornwallis, Bathurst, and Melville Islands, part of Prince of Wales Island, the land about Cape Walker and Peel Sound were explored without success. The ships wintered under Cornwallis and Griffith Islands, to the West of the entrance of the Wellington Channel, and in the opening of the navigation of the following year examined the shores of Jones Sound and returned to England.

The veteran arctic navigator, Admiral Sir John Ross, was present with this expedition in the *Felix*, fitted out by private means; and his little yacht the *Mary* was placed at Beechey Island to forward the

general object of the search. And, participating in the general anxiety which prevailed to secure success, two vessels, the *Advance* and *Rescue* were sent to join in the search by Mr. H. Grinnell of New York, assisted by the U.S. Government. These vessels left Griffith Island in September on their return, and were drifted by the ice up Wellington Channel, where they remained drifting to and fro during the whole of October and November by the changing wind, but fixed in the ice. By the 1st of December they were in Lancaster Sound, then drifting to the eastward before a westerly wind, still fast in the ice. By January they had passed into Baffin Bay and were following a line of drift nearly parallel to the western shore, varying from forty to seventy miles from it. The *Advance* had been forced into a dangerous position by the pressure of the ice, her stern being lifted considerably, so that, with her bow inclined downwards and a list over to starboard, she was constantly in a situation of peril. The *Rescue*, not far from her, lost her bowsprit, but had stood the pressure of the ice well. In this condition the vessels drifted down the bay and were not released until the 6th of June, to the southward of Cape Walsingham, and on the 17th put into Lievely, the Danish settlement, for the benefit of their crews, on their way to New York, where they had both arrived by the 7th of October, with grateful hearts, says Lieutenant DeHaven, for safe deliverance from danger, shipwreck, and disaster. This was the second and very remarkable instance of ships being drifted in the ice from the arctic seas to the Atlantic Ocean.

71. PLOVER.—While these proceedings were going forward in the East, the western expeditions in Behring Strait had been busily anticipating any arrival of Franklin's party. Commander Maguire had succeeded Captain Moore in the command of the *Plover*, which, after passing two winters at Point Barrow, in the summer of 1854 had become defective. She was sent to San Francisco, and, being found unseaworthy, was condemned and sold,—Commander Maguire and his officers returning to Europe in the *Sitka*, a Russian prize, and reached England in 1855.

73. PRINCE ALBERT.—We have already alluded to the remarkable voyage of this vessel, belonging to Lady Franklin, under the command of Commander Forsyth. Her present voyage was conducted by Captain Kennedy. The *Prince Albert* proceeded direct to Fury Beach, in Prince Regent Inlet. The voyage has obtained notoriety by the discovery of Bellot Strait, named after an enterprising young French officer, but was signalized by no other discovery of importance.

74. ASSISTANCE, Captain Sir E. Belcher, and her consorts. We have seen that although finding no more than relics at the first wintering place of Sir John Franklin, the expedition under Captain Austin had left no part unexplored of the northern shores of Melville Sound as far as Melville Island, and the greater portion of those to the southward, including those of Prince of Wales Land. Still opinions seemed to cling to hope from the northern shores of the Parry Islands, and another expedition of five vessels left England

under Sir E. Belcher. The first winter was passed by the *Assistance* in the northern part of Grinnel Land, from whence discovery was carried on East and West; whilst the *Resolute*, Captain Kellett, was busy in the West, leaving token of the presence of himself and officers in the addition of Prince Patrick Island to the chart of the Parry Group.

An event for which this expedition is remarkable was the discovery of Captain Maclure, in the *Investigator*, shut up by the ice in Mercy Bay. The record of Maclure's visit to Winter Harbour had been found. An officer (Lieutenant B. Pym) of Captain Kellett's party crossed over Banks Strait, and Captain Maclure had the satisfaction of joining Captain Kellett's ship on the 19th of April, 1853, rescued from despair, the ship having been irrevocably shut up there since 1851, and intentions of a hopeless travelling being entertained.

Another winter was passed, 1853–54, by the ships of this expedition in continuing the search and contributing to geographical discovery, when, in the summer of 1854, Sir E. Belcher received orders to abandon the ships and return home, which was done, the *North Star*, Commander Pullen, assisting in bringing home a few valuable stores. This ship had been stationed at Beechey Island, having among her officers M. Bellot, whose name has been already mentioned. This officer having volunteered to carry despatches to Sir Edward Belcher up the Wellington Channel, perished in the ice by being accidentally separated on a loose floe. As an agreeable and cheerful companion his loss was sincerely regretted.

An incident occurred in reference to one of these ships that must not be passed over in silence. Like the ships of Sir James Ross and those of the United States, the *Resolute* was drifted by the ice through Lancaster Sound down Baffin Bay, being picked up by an American captain and taken derelict to New York. To the lasting honour of the United States Government, she was immediately purchased by that Government, equipped for sea, and sent to England under Captain Hartstein, who was commissioned to return her to our Queen. This was carried out to the letter by this same officer, who the year before had relieved Dr. Kane after his disastrous voyage up Smith Sound.

75. *Isabel*, Commander Inglefield, had the good fortune to penetrate through Wolstenholme Sound, and then broke the spell which had closed Smith Sound to the attempts of Baffin by showing the constant inconstancy of ice navigation. He explored the sound fairly, opening its gates to lat. 78° 35′ N., but Franklin could not be looked for there, and was not found. He then looked into Jones Sound and afterwards passed up Lancaster Sound, communicated with the *North Star*, Captain Pullen, and returned to England,—his whole voyage occupying about five months.

76. *Advance*, Dr. E. K. Kane. The warm and generous views of Mr. Henry Grinnell and Mr. George Peabody, countenanced by the Government of the United States, were once more directed to the search for Franklin, and the *Advance* was sent by them under Dr. Kane, the companion of DeHaven in 1850, to penetrate through

Smith Sound towards the pole, examining the coast line found for vestiges of Franklin. It was truly observed by Mr. Brown of this voyage that "it could only end in adding another record of useless daring, painful suffering, and bitter disappointment." The result of this expedition, in which more severe suffering was endured than in many others, was the addition of Grinnel Land, to the northward of Smith Sound, between lat. 81° and 82°. After passing two winters and finding an open sea extending to the East and far towards the North, he was compelled to abandon the *Advance* in February, 1855, and trust to his boats to return along the coast of Greenland to the southward. On reaching Upernavik in August with his surviving companions, he found a Danish vessel, which took him to Disco; from whence the vessels sent to his assistance by the U.S. Government landed him at New York on the 11th October, 1855.

77. *Phœnix*, Captain Inglefield, accompanied by the *Breadalbane*, a transport laden with stores for the absent ships, reached Beechey Island on the 8th August, landed most of the stores at Cape Riley, and left Beechey Island with despatches from Sir Edward Belcher on the 23rd of August, 1853, arriving in England on the 4th of October following.

78. *Rattlesnake*, Commander H. Trollope, was commissioned to carry supplies to the *Plover*, in Behring Strait, sailed from Plymouth on the 23rd February, 1853, and reached Port Clarence in August following, where the winter of 1853–54 was passed. Continuing in Behring Strait until the following September, when she commenced her voyage home, touching at San Francisco, the Sandwich Islands, Valparaiso, Rio, and Fayal, arrived in England and was paid off at Chatham on the 7th January, 1856.

79. *Phœnix*, Captain Inglefield, again left England on the 6th May, 1854, with orders for Sir E. Belcher, requiring him to adopt measures "for at once withdrawing the whole of the force now employed in the search for Sir John Franklin from the polar seas," the only further search admitted being the coast to the southward of Ponds Bay, towards Cape Walsingham in Baffin Bay. These orders were implicitly followed, and the *Phœnix* arrived at Cork on the 28th September following, with the whole of the officers and crews of the *Investigator*, *Resolute*, *Intrepid*, *Assistance*, and *Pioneer*,—thus terminating the search for the relief of Franklin so perseveringly carried out by H.M. Government, assisted, as we have seen, by private means as well as the generous attention of the United States Government. Although unsuccessful they had the one barren virtue of showing where Franklin and his ships were not to be found. From this, as we shall see, the other followed in due time.

Before touching the next expedition which will fall under our notice, we must revert to Dr. Rae, who had been left in America by Dr. Richardson (No. 62), and who had contributed, besides his exploration of Committee Bay in 1854, the examination of Wollaston and Victoria Lands in 1851, passed over by Collinson in 1852 and 1853. No sooner was the excitement occasioned by the return of the last arctic

expedition somewhat subsided, than a letter from Dr. Rae threw the first important light on the fate of Franklin by the relics of plate which it informed us he had obtained from Esquimaux, and that the place where they were found was the mouth of the Great Fish River. This expedition, in consequence of Dr. Rae requiring the reward offered by Government, led to the expedition of—

80. Messrs. Anderson and Stewart, who proceeded to the Great Fish River and found other relics of the lost voyagers, confirming generally the account which Dr. Rae gave. It was a summer boat expedition despatched by the Hudson Bay Company, intended only for this service, and returned to the Red River settlement, whence they had set out.

81. Captain M'Clintock. It is a remarkable fact that notwithstanding the great energy displayed in the long series of searching expeditions above referred to, in which some thousands of miles of coast were carefully explored with a degree of zealous perseverance in face of difficulty and danger of the most formidable kind, that one small portion of the arctic shores should have been unheeded. It was not forgotten, for it was included in the orders given to the first of the searching expeditions. And these shores remained unexamined, and lay to the last unheeded. But they were well marked. Observing eyes, directed by sad hearts, had dwelt on them, and there was no necessity that we should point them out, as we did in our "Reflections" in the number of this work for March, 1856, or that we should allude to the most important report which had reached us of unequivocal indications of Franklin's party in the summer of 1847, when assuredly they were in these very parts. But the time went by. Succour had gone too late, and then in the wrong direction. Discovery could avail no longer, for the relics brought home by Dr. Rae left no doubt as to the unhappy fate of Franklin and his party. Yet in more than one lonely heart the desire was uppermost that the long neglected portion abovementioned should be searched; and can any one wonder that in the year following the return of our last expeditions a little solitary vessel was threading her way through the ice of Baffin Bay, sent privately to explore this first remembered but last forgotten portion of the arctic shores.

This was no other than Captain M'Clintock in the little *Fox* (steam and sail), which became hampered in the ice at the head of Baffin Bay and passed a winter (1857–58) of danger and toil, drifting throughout the whole range of that perilous navigation, fixed at the mercy of the ice, and being released only on the 25th April of this year of 1859 to pursue the object of the voyage. The *Fox* reached Beechey Island, from whence she proceeded down Prince Regent Inlet and entered Bellot Strait, where an excellent harbour (Port Kennedy) was found for the winter of 1858–59. From hence Captain M'Clintock and his companions, Lieutenant (now Commander) Hobson and Captain Allen Young, pursued their cherished scheme, and explored the neglected shores of Prince of Wales Land, Boothia, and King William Land. Their search was rewarded with more relics and, above all, by the only written documents which have been recovered of the

lost party. Those papers told the plain and simple truth,—the death of the leader of the expedition, Sir John Franklin,—the positions in which the ships had been frozen up irrevocably since September, 1846! after wintering at Beechey Island, and that they were abandoned but a few miles from the N.W. shore of this land. Moreover, Captain M'Clintock learned from Esquimaux that one ship had foundered there in the ice, and that the other had been driven by it on the island. Thus, then were the opinions realized that had led to this expedition, and thus something more than probability thrown on the opinion of Mr. Peers, from Peel River, of Esquimaux being in company with Franklin's party in the summer of 1847 on the coast East of the Mackenzie!

With the precious newly found relics and the records abovementioned, the *Fox* returned home, touching at Disco in August, and arriving in England about the end of September of this year, bringing with her a final answer to the long agitated question of what had become of the Franklin expedition.

[We have been necessarily brief in the particulars of the several expeditions to which we have here alluded and must refer our readers to our volume for 1856 (March) wherein they will find a chart showing the several parts referred to, the volume for 1853 (November and December) also supplying a continuous chart of the coast from Behring Strait to Baffin Bay. The pages of this work will supply much information on arctic matters, and in the present volume will be found the interesting report of Captain M'Clintock. We understand that a complete narrative* of the final expedition by this officer is in the press, and may be looked for by the end of the year, which will give many interesting particulars of his perilous voyage.—Ed.]

Masters in the Royal Navy.

Mr. Editor,—Every nautical man who peruses Macauley's *History of England*, cannot fail to be interested in his account of the rise and progress of the British Navy through the different reigns of our sovereigns. The details into which he enters are fully authenticated by references to the original correspondence of those days and are given at length in that admirable work. In vol. i., p. 303, he describes the position of Masters in the Navy about the latter end of the reign of James II., (the captains of those days being appointed entirely through Court favour, without any nautical education whatever!) He says, "The direction of the navigation was therefore taken from the captain and given to the master. But this partition of authority produced

* Entitled, *The North-West Passage*, and the most complete work in one volume that we know of on these matters.

inconvenience. The line of demarcation could not be drawn with precision. There was therefore constant wrangling. The captain, confident in proportion to his ignorance, treated the master with lordly contempt. The master, aware of his danger of disobliging the powerful, too often, after a struggle, yielded to his better judgment, and it was well if the loss of the ship and crew were not the consequences. In general the least dangerous of the captains were those who completely abandoned to others the direction of the vessel, and thought only of making money and spending it."

The prevalence of favouritism in those days will easily account for the disgraceful state of discipline described by Macauley, although, in the reign of William III., the naval service was somewhat improved in that particular by the stringent measures introduced from Holland as practised in the Dutch fleet. But in the days of Smollett our navy was still in a most unsatisfactory condition, and it was not till the early part of the present century that our ships had attained the perfection of smartness, discipline, and order. Of late years, however, these qualities seem to have materially declined, partly from the effects of a long peace, and partly from the constant interference and writings of certain busybodies, who are wholly ignorant of the naval service and its requirements.

From what appears in the foregoing respecting masters in the navy, it is quite evident that in former times this class of officers must have been obtained from the merchant service, which in those early times would have completely taken the lead of her Majesty's officers in seamanship and navigation. It is stated in Hardy's Register that the ships of the East India Company had doubled the Cape as early as the year 1601, but that no man-of-war had done so until 1662; and it will be in the recollection of many that masters were appointed at once from the merchant service, merely going through the requisite examination for the pilotage of the British Channel, with which most of them were practically acquainted.

The manner in which the ships were handled during the war with France, when we had enormous blockading fleets abroad, proved that the system answered. No one can look back to those whom they remember in that capacity without feelings of the greatest respect for their ability and first rate seamanship. We may rather be astonished how such valuable men could have been obtained with so small a prospect of adequate remuneration as they had, for theirs was no position from which to rise in the service like the rest of their messmates. Such men could not now be obtained, although the prospects of commanders and officers of merchant ships are much worse than formerly. The repeal of the navigation laws (effected by men wholly unacquainted with maritime affairs) having handed over to foreigners all our great maritime profits and interests.

The masters of the navy in these days being entirely brought up in this service, or received from the merchant service while very young, have no longer the opportunity like those of former days to acquire a practical knowledge of Channel navigation more than any other officers of

the naval service. If obliged, therefore, to pass an examination in Channel pilotage, these could just as easily take charge of her Majesty's ships as the master himself. There is no reason why officers in the merchant service should still be able to say that "with all the much vaunted education of the present day, naval officers are not even entrusted as they are with the navigation of their own ships. But let us suppose that the rising generation of naval officers are to understand that every captain was in future to navigate his own ship, (merely selecting some officer of the ship to assist,) the navy without doubt would stand the first, then, as it ever ought to do, in each branch of the profession. French ships of war carry no masters, and while it is notorious that many young men of other professions are crammed at an enormous amount of labour and expence with subjects the greater part of which are wholly useless to them professionally, the most practical service we have falls into the opposite error, and its officers do not even apply to practice such part of their education as would be really useful to their country! An important change of this kind in so large a service could only be accomplished gradually, and should be effected without any sacrifice of vested interests. But it would naturally be asked, what is to be done with the masters at present in the service? It may easily be seen by the *Navy List* that the lieutenants fit for service are not proportionate to our large and increasing fleet, and as to mates there are but thirty-two on the list for the whole service, eight of whom are superannuated. In fact, were the country in any danger, a resort to a supply of officers from the merchant service as mates would be indispensable, some years being required to bring forward the numerous cadets. The whole of the masters fit for service might with advantage be absorbed into the list of lieutenants, some of the seniors being promoted to commanders, and those unfit for service being placed on the retired list.

When it once becomes the custom for captains and commanders* in the navy to navigate their own ships, it would be found an agreeable and interesting occupation where so much leisure exists. In fact, many have taken it up from choice, particularly in India, where many excellent opportunities occur for making observations, and where they have invariably excelled, and stimulated others by their useful example. While things remain as they are, it gives those in other services too much reason to believe there is some truth in the observation which is not at all uncommon, viz., "That masters are continued in the navy to bear the blame of accidents."

Should it however, be resolved to continue the present system, the following suggestions may be found useful from one who has served in both services. They will show how to obtain the best instead of the worst officers which are likely to be found in the merchant service by the present plan. It will never answer to select for the British

* Our correspondent writes as if this were never done. Whatever may be the case now, we remember some exceptions in former days in ships that we have sailed in.—Ed.

navy from the junior grades of the mercantile marine. But since the examinations in the merchant service have been established, the commanders with the chief and second mates, many of whom have passed for a command, may be considered among the best practical seamen and navigators that we have. These are the men who should be induced by proper encouragement to enter the navy as masters, passing of course an examination on the pilotage of the Channel, having obtained first rate certificates from their last employers. Frequent promotion for merit should place them on the active list of commanders, and when unfit for further service, they should be entitled to retired ranks in some larger proportion than at present.

In making a comparison between the pay and emoluments of the two services, we should not include the officers of small merchant ships, who are so notoriously ill paid that but few of the kind of men wanted are likely to be found among them. But we will confine our observations to a class of educated men who are well adapted for the naval service. These are the officers of East Indian and Australian ships of the first class, the Australian clipper ships both of London and Liverpool, and those of the large contract steam companies, who are always brought up in sailing vessels.

Pay of chief mate in contract steam-vessels ..	£10	to	£15	per month.
,, East India ships	8	,,	10	,,
,, Australian trade	7	,,	9	,,
Pay of second mate contract steam-vessels ..	7	,,	9	,,
,, India ships	6	,,	7	,,
,, Australian trade.....	5	,,	7	,,

The whole of these officers have a good mess found them at the same table with the commander, but have no half pay or pension when disabled or unfit for service.

A very fair half pay is, however, allowed to officers of the contract steam vessels while waiting to fill up vacancies in other ships.

Sea-pay of masters R.N. after 20 years' service.	£27	18	0	per month.
,, 15 ,,	23	5	0	,,
,, 10 ,,	20	3	0	,,
,, 6 ,,	17	16	6	,,
,, under 6 ,,	15	10	6	,,

Besides the above, a store allowance [per quarter?] from £3 to £6 per month is granted to masters, but they have to pay the expence of their own mess with the lieutenants.

Half pay of masters R.N. after 20 years' service ..	£327	5	per annum.
,, 15 ,,	182	10	,,
,, 10 ,,	146	0	,,
,, 5 ,,	109	10	,,
,, under 5 ,,	01	5	,,

It will be seen by the above that while serving there is not any very great difference between the emoluments of masters in the navy and chief mates in the merchant service, considering that the latter have

their mess found them, which is equivalent to £60 per annum; but as the naval officers have their half pay as a matter of right, the advantages are decidedly in favour of the navy.

Before dismissing the subject, it is as well to point out what are the advantages of obtaining a command in the merchant service of the first class. In the large contract steamers the amount of remuneration varies from £600 to £800 per annum, partly made up of a per centage on freight and passage money, with a mess provided on board. But in this class of vessels the retention of the berth is very precarious, as there are no tellings off or slight reprimands as in the navy for running a ship on shore or losing her. But it is an understood thing by both parties that such casualties are to be followed by irrevocable dismissal from the service, no matter what verdict a trial by the Board of Trade may announce. These vessels are not insured, and sometimes are of enormous value, some having left Southampton with as much as £800,000 in specie alone!

The examination of officers generally in the pilotage of the British Channel, although new to the navy, was not so in the late service of the Hon. East India Company, where an examination for either chief or second mate was a qualification for a command. Again in the present examinations of the merchant service, the pilotage of the Channel is included, and the chief mates are examined pretty strictly therein, but perhaps not quite so much so as the masters in the navy. Sufficient, however, must be known for all practical purposes, and the opportunities those officers have of seeing their vessels so often worked round from the Downs to Portsmouth give them a very fair practical knowledge by the time they attain a command. This command is worth something less than that in a contract steamer, although they are much more independent and free from control, neither are they dismissed their ships except in gross cases of neglect or misconduct.

Officers in the navy having so much more leisure than those in the merchant service, have an additional reason why they should navigate their own ships. The art of navigation is to many a most interesting employment, as has often been evinced by captains of men-of-war voluntarily taking that responsibility on themselves. Such officers also who have been employed in the surveying service have brought forward charts unequalled by any others. Merchant ships are compelled by law to take pilots into Plymouth, Falmouth, Spithead, and through the Needles, which duty the masters in the navy are bound themselves to perform, but considering the great increase of late years in the number of lights, buoys, and beacons, together with steam power, no naval officer, examined for the purpose, need hesitate to undertake to navigate a ship of war, unless he merely comes into the service as a matter of convenience to gain the name and rank of an honorable profession.

I am, &c.,

TRIDENT.

To the Editor of the Nautical Magazine.

The Religious Condition of Seamen.—No. II.

We left off with a promise that we should next endeavour to picture the position of a boy starting on his first voyage, which is generally between the ages of fourteen and seventeen, be it in a ship of war or a merchant ship, as a midshipman in the former, as apprentice or boy in the latter. We know that he will be surrounded by fellow creatures, from his own age up to fifty or sixty, and by twenty to a thousand or more in number, according to the size of the vessel and the service she is in. It must be kept in mind that our object is to consider this boy as an immortal being, one who will find an eternity of bliss or woe hereafter depending on his state at the end of that very short stage of existence which this life comprises, and that we have to point out what influence this new position will have upon him.

Now let us suppose he has been brought up by parents who were true Christians in word and deed. We can then imagine how carefully the true principles of Christianity have been explained to him;—how his common sense has been convinced that it is madness to neglect his soul, and that the object of his prayers as well as his endeavours should be, to be always prepared for death and eternity; especially as he is entering on a profession notorious for its dangers, and where his duty frequently requires the risk of life to such an extent that many of about his own age have been suddenly and unexpectedly summoned to meet their God!

Every one knows that example, or the practice of those about us has a marvellous influence over us, especially while we are young. Children even imitate boys. Boys imitate men, and therefore it is that this boy might be anxious to know the feelings of those around him in reference to the religion which he has been taught, and has seen in the example of his parents to be of the first importance, although he may find in himself many inclinations warring against its rule. We will therefore suppose that he goes up to each person on board, and in the innocence of his youth asks, are you prepared for eternity? if not, are you preparing for it? Perhaps he might not ask exactly these questions; still what he would like would be a correct answer from each person about him. My nautical readers may guess what proportion of them, his shipmates, would answer in the affirmative. All will agree that most of them would answer "No," to both questions, and laugh even at such an idea.

Here, then, arises the important question, "Which is right?" for we have the picture before us of an innocent human being with religious impressions, in contact with the world which pays but little attention to this subject. To enable us to answer the question let us go back to the object of the Bible, and take for granted that it is to impress right principles in man, from whence his every action should take its rise; and that these principles are the same, be he rich or poor, highly or but very partially educated; or, again reverting to the sea, be he cabin boy in a collier, or an admiral in command of those fleets which wield the destinies of his country.

Let it be granted, then, that the principles of action are the same in the Christian admiral as in the Christian cabin boy, and that the difference only exists in their application, depending on the circumstances around them and the intellectual powers within them, either natural or acquired. This granted, two questions then force themselves on the mind of every thoughtful sailor, who must hold some position within these two extremes; they are these: "What are these principles?" and "Am I governed by them?"

The answer to the first of these questions is "Love God with all your heart, and your neighbour as yourself." The answer to the last must be supplied by each man's conscience. We are not now dealing with the means offered by the Bible to enable us to put these principles into practice, which by the way are ample, however impossible they may seem to those who will not give the subject due attention; but we are alluding to actual requirements of God from man, as exemplified in the Bible, independent of his profession and the rank he may hold in it. Therefore we think the question as to which is right is answered, and that the boy's inquiries of those around him as to their preparation for eternity are based on the soundest principles of Christianity; whilst the number in any ship who would laugh at him, as compared with the number who would think him right, is a scale for finding the proportion of those who neglect Christianity, to others who are striving to work up to its requirements.

We are all too liable to take numbers as our guide, and to go with the stream. But we must bear in mind that the Bible is the only communication we have from God, and its requirements are what we should strive after, even though we should be unable to find one single example of a man influenced by them. We must also remember that the Bible honestly tells us of a "straight gate and narrow way, and few there be that find it." Therefore though we might desire to avoid peculiarity when it may be conscientiously done, we must not be surprised if our obedience to the Bible makes us peculiar. The amount of a true Christian's peculiarity will vary according to the standard of the society and nation in which he lives. But our Saviour is his standard, and he prays constantly

"Renew my will from day to day,
Make it like Thine, and take away
All that now makes it hard to say
Thy will be done."

Hence he strives by using all the means to which the Bible directs him to make Christ the central orb of his system, and by getting nearer to Him to be less and less influenced by contrary attractions. Whatever their earthly relations may be to him, still he will avoid unnecessary peculiarity, on St. Paul's principle of being all things to all men that he may save some, and by example and precept help on others who are even more distant than himself from their great centre—Christ.

We have supposed the boy's parents to be true Christians of the highest order. But the parents of those who go to sea are of course

people from all classess of society and with all conditions of mind. Nevertheless they may lay it down as a rule that just in proportion as they are far from being true Christians themselves, their conduct has led to increase their children's difficulties when stepping for the first time on board ship. The boy whose parents have neglected religion has *their* example of long standing to take with him among the larger number about him, and the heart within him is also drawing him further from God. Children are guided ten thousand times more by the example than by the advice of their friends.

I fear, then, that we must consider this new position of the boy is where the example of the larger number tends to banish religion from his thoughts, and the influence of that position is to keep it so. Let us hope that he will be favored with the support of some few who appreciate the wonderful benefits conferred on man by Jesus Christ, and whose practice keeps pace with their profession of Christianity, by remembering and going to the right source for the accomplishment of the gracious promise, that "He who hungers and thirsts after righteousness shall be filled."

Now dissatisfied as our youth might be with his discoveries we would not then have him return to his friends and try to find some other profession with fewer temptations, which by the bye might be hard to do. But we would have him convince himself that what he feels is the common lot of all thoughtful boys stepping into the world for the first time, and that the greatest opponent he will have is after all the state of his own heart, and his inclination to do as he finds others do to contend with. Therefore we should say to him, pray earnestly for the power to follow the right course, to preserve a right spirit within you, a right heart within you, for the Saviour says out of the heart proceedeth all evil; remembering at the same time that the true Christian is "not slothful in business," that is, "duty," and therefore using all your powers to render a prompt, diligent, and even skilful professional obedience to your superiors. This will gain him their confidence, while he will remember that privacy is not requisite for prayer, neither must he of necessity fall down on his knees, as if by sudden impulses every where. But seeking earnestly for a humble state of heart, he, the sailor boy, may pray as he walks the deck, inaudibly indeed to all around him, but not to the Great Author of his being, nor yet unwitnessed by the sky above and the sea below him. Such is the prayer of the heart far more acceptable to God than the posture of the body.

I must risk the chance of repetition. It is not to be supposed that any discovery has been made on the subject of religion. For the object of this paper is to bring the few well-known truths which form the ground-work of true religion prominently to the notice of sailors, fully engaged as they are in the most active of professions and liable to think that its very activity is an excuse for their neglecting their souls. On these grounds I repeat that the power to be religious depends entirely on the state of the heart and not on the circumstances in which we are placed. As in a pair of scales the greater weight lifts the lighter; so when the desire to please God rules in the heart it makes all other de-

sires give way. Circumstances, it is true, do much towards showing whether this be our ruling principle or not; for in some stations it makes a man differ from all around him; in others this is expected of him; but it sits supreme, whether the hand of Providence may lead him into a profession where its opponent is a mere feather, or as it were a mass of lead; each and all find a power equally able to make them smile at every obstacle.

We are told, "as thy day is, so thy strength shall be." Many would like to have a stock of strength on hand, so that they might always feel it. But this is not promised and might lead to arrogance, so that very frequently the opposing feather flies up no quicker than the lump of lead. For who has not noticed trifles more difficult to overcome than real troubles? This should teach us the important lesson that all Christian strength is from above, and that the *vine branch* must look to the *vine* for sap to form the smallest bud, as well as to mature the finest fruit.

To this extent have I apparently wandered from my subject, striving to hold up faith in Christ's sanctifying power to the notice of those who would be Christians in practice as well as name, and to show that we may reduce all our religious difficulties, be our earthly position what it may, to the one great question:—"Is God's will the rule of our hearts?" It had not been so, but it became so, in the cases of the jailer at Philippi; of Zaccheus when our Saviour called him from the sycamore tree; and of the repentant thief on the cross. May we not say that the changes experienced by Zaccheus and the jailer resemble exactly those required by persons who have lived some time in the world without thinking to any important extent on religious subjects? What they supposed to be the will of God suddenly became their rule of life, and they fulfilled it without considering the consequences, because His will became paramount in their hearts. In the jailer's position, for instance, would not a man of the world have found fifty potent reasons for not releasing prisoners whose escape might have cost him his life? Then the ignominy entailed by washing the stripes of despised Christians. Then again the danger he exposed himself to of being punished as one "of that way." Any one of these reasons would at once have deterred him from what he then would have considered so suicidal an action, but now a new heart and right spirit have been given him, which makes God's will his rule of action.

The thief on the cross is the only instance given in the Bible of a man not having lived to bring forth fruits by good works and to lead an exemplary life after faith in Christ was given. But our Saviour's words to him "This day shalt thou be with me in Paradise," prove that he was changed and fitted for the employments of Heaven. Here we have two great lessons; one, that *Christ's merits*, not *our own works*, save us: the other (taught by Zaccheus and the jailer) that true faith in Christ produces such a change that the recipient from that time shows his faith by its fruits, and enters on a course which eventually fits him for Heaven. The suddenness of the change and how much it will be noticed by those around him, depend much upon his

previous life. But vicious habits, be their strength what it may, and all other opposing forces, must give way to true faith. No Christian should feel satisfied who is not sensible of the growth of holiness in his soul.

We will then suppose our young sailor has had his confidence shaken, and with a mind alive to the dangers around him, and to weakness within him, has passed several days on board his ship. To a fine high-spirited boy how interesting is all about him, and how confidently does he write home that he has no fear of not liking the sea, which feeling one admires as the warmth of youth turned in a right direction. All being ready, he starts on his first voyage. Very frequently this takes place on a Sunday, or if not, it may happen that Sunday comes before the ship is out of harbour, when the boy's religious feelings will be shocked by steam-tugs coming alongside, and the day being spent as any other. No doubt he will often hear the nautical distich—

"A Sunday sail
Doth never fail."

but he will say in his own mind, this is not in accordance with what I was taught at home, nor with what all around me and those who order us to go were taught when they were young; and the thought might naturally arise, "How is it we are taught as children what we are not expected to follow as we grow old?" It would be hard to answer this question satisfactorily. The working on a Sunday where it can reasonably be avoided is clearly wrong. At sea it must be done. Sails must be trimmed; observations must be taken, and with subordinates it is their duty to obey all orders from their officers, for the onus rests with these, not with the subordinates; who, if religiously inclined, may generally get some time for reading and quiet meditation. The working of ships in rivers is an advantage that our worldly inclination takes of the fact that ships must work sometimes when at sea. It is indeed the worldly principle struggling for success, relying on its own endeavours, setting aside the laws of God, and forgetting that his hand, no less present although unseen, rules everything. In fact we may more properly call this kind of Sunday work, the building of barns wherein to bestow our goods, forgetting the awful sentence, "Thou fool, this night thy soul shall be required of thee!"

Commanders would do well to consider this Sunday sailing and labouring; for much rests with them. Except in extraordinary cases, all unnecessary labour after the day has commenced might reasonably be avoided, and generally divine service might be performed and books lent among the crew, who might be required by the heading of the agreement, to come clean to church on Sundays. As to the men making a right use of these helps, the commander is not answerable, but his example will have much influence.

We will now give our young sailor time to recover from sea-sickness before expecting him to pay attention to any further advice on these important subjects.

Navigation of the Pacific Ocean.

(Continued from page 600.)

Pass either North or South of this islet, avoiding a bank under water nearly two miles to the eastward, and which is the only hidden danger in Bligh Channel; then a course E.N.E. for Cocoanut Island, the eastern end of which is covered with cocoanut trees. Pass North of this island, and take the channel formed by it with Dove Island, which is low. Having passed North of Dove Island, leaving Village Island to the East, steer about N.E.b.N. in the channel between the northern islands of the strait and the Great Barrier Reef, which here bounds the South coast of New Guinea.

It would be difficult to show clearly the route to be taken amidst this archipelago of wooded islands; but steering N.E.b.N. for thirty-five miles after having left Dove Island, a vessel may sail and take the channels which separate them with confidence, and approach within half a mile of the N.W. shores of these coral islands; for their reefs always grow off their S.E. and E.S.E. extremities.

Having run thirty-five miles on the course abovementioned, in depths from 16 to 18 fathoms, (sandy bottom,) taking care to make due allowance for the set of the tide, Stephens Island will be at hand, and the entrance of the channel will be seen.

Stephens Island.—Stephens Island is known by being higher (160 feet) than the other wooded islands in this part of Bligh Channel, and is separated from the little (Campbell) island by a channel two miles wide, which must not be taken. Campbell Island lies S.W. of Stephens Island.

If the weather is at all clear, Darnley Island, which is 580 feet high, and round, will be seen. In Treacherous Bay, where this island is, good anchorage may be had, with some supplies of fresh water and provisions; besides good shelter from S.E. winds.

Having passed North of Stephens Island, a course nearly N.E.b.E. will take a vessel clear out of Torres Strait by Bligh entrance, bounded on the North by Bramble Cay, on the South by Anchor Cay and the dry sand banks which are to the North and beyond the reefs of Darnley Island.

Having passed Bramble Cay either to the North or South, a course should be steered gradually to gain the parallel of 9° 15′ which passes North of the Eastern Fields and Portlock Reefs. A vessel should run East, then S.E for Cape Rodney at the S.E. part of New Guinea, where, being in an open sea, a course may be taken as desired.

Route from Eastward for Torres Strait by Bligh Channel.—A ship desiring to take Bligh Channel from the eastward or the Pacific Ocean, after having passed Cape Rodney should gain the parallel of 9° 15′ on which to run West. This will take her North of the Eastern Fields, Portlock Reefs, into the fairway of Bligh Channel. The channel would then be followed, reversing the directions already given,

and the Indian Ocean entered either by Endeavour Strait or Prince of Wales Channel.

The Eastern Fields and Portlock Reefs.—The Eastern Fields, discovered by Flinders, are a detached collection of coral reefs. Portlock Reef is of the same kind, leaving between them and the Great Barrier a safe channel thirty-four miles wide. In the vicinity of Portlock Reef 55 to 57 fathoms are found, on a coral bottom, decreasing gradually to 45 and 36 as Anchor Cay is approached.

Anchor Cay.—Anchor Cay is a small sand bank situated at the N.W. extremity of a detached reef; Darnley Island is visible from it in fine weather; with another of the same kind, the East Cay, which is nearly three miles E.S.E., it forms the southern limit of the entrance of Bligh Channel in the Pacific Ocean. These two cays are both extended on the S.E. side for a good mile by a reef, and are separated from the northern extremity of the Great Barrier by a safe channel seven miles wide.

Bramble Cay.—Bramble Cay, to a vessel from the eastward, is the best mark for knowing the entrance of Bligh Channel. It is a sand bank 10 feet high, visible from the mast-head seven or eight miles off, and is fringed by a reef, which extends one mile from its E.S.E. extreme. This sand bank is covered with scurvy-grass, and is the retreat of an amazing number of birds. A detached patch of black rocks, ten feet high, lies S.W.b.W. three miles from it, with a safe channel between them, and the rocks may be approached to about a mile.

Darnley Island.—If the weather be at all clear, when a vessel is six or seven miles South of Bramble Cay, Darnley Island should be seen, with its long reef, having a sand bank at its extremity reaching nine miles N.E. from it. North of this reef are three separate detached coral reefs, with safe channels between them, the two southernmost of which dry at half tide. They should be looked for with much care, because they narrow the entrance of Bligh Channel in this part. They always break, but at high water the northern reef is entirely covered, and it is seven miles North of the sand bank at the extremity of the reef, which extends from Darnley Island, or nearly sixteen miles N.N.E. of the island. A vessel entering or leaving Bligh Channel should always pass North of this reef. The channel between it and Bramble Cay is safe, and about fourteen miles wide.

The southern part of the entrance of Bligh Channel, between Bramble Cay and the North reef, should be carefully avoided at night; for there is ample space for a ship to lie to or anchor in 20 fathoms on a sand and coral bottom, in any part of the channel North of Bramble Cay; that is, between the cay and the coast of New Guinea, the nearest point of which is thirty miles from it. We must take care not not to get into less water than 5½ fathoms when approaching the coast of New Guinea, or at a distance of seven or eight miles from land. This coast is low, and can only be seen from the deck from twenty-seven feet.

Tides.—Near Bramble Cay the flood comes from N.E. and E.N.E.;

at springs its rate is nearly two miles an hour. The ebb runs faster in the opposite direction. As the flood approaches New Guinea it takes a more northerly direction, and along the coast it runs N.W. and N.W.b.W. A constant westerly current of at least one mile an hour may always be expected when running for the entrance of Torres Strait, and this rate is increased after a gale.

At fifteen or twenty miles from Bligh entrance, the ebb does not appear to have any influence, and the westerly current being the most general, is only felt. Having passed West of Bramble Cay, the flood will be found setting West and W.S.W., then it turns southward, on account of the reef off the South coast of New Guinea.

Towards the middle of the channel, near Dove Island and the Sisters, the flood sets N.W. and the ebb S.E. The rise and fall at springs is not more than ten feet. At Darnley Island the establishment is 9h. 30m., rise ten feet. On the South coast of New Guinea the establishment is 10h. 30m., the rise fourteen feet. At the Sister Islands, in the middle of the channel, the establishment is 11h. At Cape York it is 12h. At Wallis Islands and the western extremity of Endeavour Strait, it is 1h. The tide thus turning two hours later in the channel than on the coast.

From Cape York through the Barrier by Raine Island Passages.—We shall confine our remarks to showing the routes that are taken from Cape York through the Barrier Reefs by the Raine Island Passage instead of Bligh Channel. The first part of this route, as far as Cape Grenville, is the last of that given by King from Sydney to Cape York by the inner route, and we shall continue afterwards his directions, the other part of this route being described by Captain Blackwood, who gives directions from Raine Island to Cape York.

From off York Island a course should be steered E.S.E. South of Mount Adolphus Island and North of the Albany Islands, looking out to avoid a danger between these two islands, with $2\frac{3}{4}$ fathoms, and leaving the Brothers Islands to the eastward. When the northernmost of these two islands bears East, or the N.W. point of Albany Island West, the course should be changed to S.S.E. $\frac{1}{2}$ E., to pass East of Turtle Island and Shadwell Point; and leaving the reefs Z and X on the East, then keeping the same course nearly, leaving Gilmore Bank to the West, and Cairncross Island to the East, passing between this last and Bushy Island. From thence steer so to pass East and near the Hannibal Islands, leaving to the East several small sand islands, the Boydong Cays, and the W and V reefs, and then passing North or South of the Bird Islands. Then as convenient take the North channel North of the reef and Cockburn Islands, or the Pollard Channel, which is to the South of them. These two channels unite South of the Middle Banks, from whence Raine Island may be steered for.

From Sydney for India.—Vessels leaving Sydney or ports on the East coast of Australia for India, during the S.E. monsoon, (from April to October,) will find it more advantageous to go by Torres Strait than by Bass Strait at this time of year, on account of the strong westerly winds prevailing along the South coast of Australia.

For Torres Strait a ship may take either the inner route of King, within the Great Barrier Reefs and the coast of Australia; or, the outer route, outside of the Barrier.

Inner Route.—When taking the inner route, says Capt. Blackwood, a ship must follow closely the directions of Capt. King, for from the condition of these seas it is possible that steep coral banks may exist close by the tracks where deep soundings appear.

From Sydney to Sandy Cape, where King's directions begin, the navigator has only to navigate an open sea, without dangers. A ship having rounded Breaksea Spit in the evening, it will be dangerous to continue on during the night, and therefore having run five or six leagues N.b.W. ¼ W., she should lie by for the night; if, on the contrary, she is off Sandy Cape in the morning after having rounded Breaksea Spit, the course will be W.N.W. ½ N. about a hundred miles, this will take her about twenty miles from Cape Capricorn. In this route, which passes about three miles inside of Lady Elliot Islet (low) and the southernmost islet of the Bunker Group, the effect of the current will be seen, which will be allowed for accordingly. If it sets North, these islets may be passed on either side.

Having made Cape Capricorn, the shore should be followed at a convenient distance, the course N.N.W. ¼ W., passing on either side of Peaked and Flat Islands, South of Port Bowen. Continuing on for the Percy Group, pass between Nos. 2 and 3 of the Northumberland Group, and having passed No. 3, a dangerous low rock five and three quarter miles N. 16° E. and West of No. 1 island must be avoided. During the night this should be done by keeping near No. 3 of the Northumberland Islands, which is high and steep. The channel on each side of the Percy Islands is safe; but that West of these islands being the best known, should be preferred; then following the route of the *Mermaid* and *Bathurst* along the coast as far as Cape Grafton. If the weather be fine a ship may get as far as this cape by night, but it must be observed that off Cape Grafton the Barrier Reefs approach the coast and contract the channel. Fitzroy Island should be passed a mile distant, and when its northern point bears West, a course N.W.b.N. (or N. 35° W.) should be steered for thirty-five miles, which will take the ship to about a league S.E. of the Low Isles. If they be reached by night, they should not be approached within twelve fathoms. In this route great care must be taken not to borrow to the East, to avoid a rock seen by Tamar (Satellite Rock of the chart). If the weather be fine and the moon up, these islands will be easily seen: but it will always be more prudent to navigate only by day.

In the route abovementioned the depth will be from 16 to 17½ fathoms.

From the low isles abovementioned steer for the Hope Islands, which are N. 16° W., distant thirty-eight miles from them. It is, however, preferable to keep West of this course, to avoid several rocks situated in 15° 51′ S. lat.; Cape Tribulation will then be passed at two miles, from whence shape a course to pass East or West of the Hope Islands. It is best to pass West of the most westerly of the Hope

Islands, and follow the reef at about three quarters of a mile round this island, continuing to the northward, and pass East of the little detached rock *a*. When off the northern extremity of this last reef, a course N. ½ W., twenty-eight miles, will lead to Cape Bedford, which may be passed at a distance from one to four miles. In the above route, at three and a half miles from the reef of Hope Island, reef *b* will be seen. At fifteen miles from it the ship will be abreast of reef *c*, and five miles further she will pass Turtle Reef, remarkable for a dry sand bank at its northern part. All these reefs will be left to the East. The current sets N.W. and must be allowed for. In passing along the coast the heights will be observed as marked on chart No. 1076, the high hill like a cone, at the southern side of the entrance of Endeavour River and Cook's Mountain. By bearings, this mountain and the other heights, as well as Cape Bedford, a vessel may make sure of her position, and discover the effect of the current, which is not generally very strong in this latitude, not more than about two miles an hour.

Off Cape Bedford the course is North, and the Three Isles, which are flat and wooded, will be seen ahead. Steer to pass West of this group and East of Low Island, wooded, then steer direct for Cape Flattery which should be passed with a good berth, then for Point Look-Out, so as to anchor West of it near the Turtle Group, unless daylight admits of reaching Nos. 4, 5, and 6 of the Howick Group, near which will be found good anchorage. Point Look-Out must not be approached nearer than two and a half miles to clear a reef marked on Captain Cook's chart. It is one and a half mile North of the peak-shaped hill at the extreme end of the point. The Turtle Islands may be passed on either side or between Lizard and Eagle Island, but it is not advantageous to do so because the wind is much stronger the further from the coast and the distance is ten or twelve miles greater than the other; there is a good anchorage West of the peak of Lizard Island. From the Turtle Islands steer North 55° W. (N.W.b.W. nearly) for the hillock on the S.E. extremity of the island No. 1 of the Howick Group, leaving it to the East, and passing about one mile West of islands 2 and 3 of that group, then between No. 4 and Cole Island, and West of No. 6 island and the sand banks S.E. and West, partly above water. If the day is advanced when abreast of No. 6 of Howick Islands, it would be better to anchor under its lee than to stand on as there is no good anchorage between it and Cape Flinders.

Having rounded Cape Melville Flinders Group will be seen. The end of the reef off that cape bears from it N. 31° W., and Pipon Island about S. 62° W., with a reef round it. Having passed between these two reefs steer direct for Cape Flinders, the North point of West Flinders Island. The course is W. 4° S. (W. ¼ S. nearly) distance nearly twelve miles. In this run a low wooded island and the reefs *a* and *b* should be left to starboard. The *Satellite*, in 1822, touched a small reef nearly two miles E.N.E. of Cape Flinders, but as the cape may be approached almost within a stone's throw it may easily be avoided. The best anchorage under the lee of Cape Flinders is to have shelter

of the flat hill upon it; at one mile from the shore the depth is 8 fathoms, a muddy bottom. In passing the cape care must be taken to clear a shoal which extends two cables' length from the shore on its Western side. If daylight favors to run fifteen miles beyond the cape the ship should anchor under the reef *d*. In these latitudes anchorage may be had under shelter of all the reefs or islands between Cape Flinders and Cape Melville; the bottom is of mud everywhere, and anchoring N.W. of the rocks there is sufficient shelter from the sea which is generally smooth.

On leaving Cape Flinders, steer W. 14° N. for twenty-three miles, leaving the rocks *c*, *g*, and *h* to the North, and the rocks *d*, *e*, and *f* to the South, then steer N. 31° W. to pass West of reef *i* and Pelican Island; then East of the Claremont Islands, No. 1 and No. 2, which are low and wooded.

When abreast of island No. 2 of this group the S.W. extremity of reef *m* will be seen, which should be passed distant one or two miles, and steering N. 10° W. the islands No. 3 and 4 of the same group will be reached: pass either to East or West of the island No. 4, the channels being both safe. If passing East of No. 4 steer N. 5° E. to pass near the reef *o*, passing West of this reef and isle No. 6 so as to avoid the low rock, covered at high water, and which lies about two and a half miles N. 64° W. of this island. Passing West of isle No. 4, keep a mile and a half or thereabouts from it, and when it bears East steer N. 13° E. for isle No. 6, passing it West one mile to avoid a sunken rock N. 64° W. from it. Passing this rock steer for isle No. 7, and pass one mile West of it to avoid the dangers which extend East of Cape Sidmouth. From thence steer N. 17° W. for Night Island, and when abreast of it keep North, until near the hidden rock *v*, which should be left to the East; then steer so as to pass East of the Sherrard Isles, keeping between them and the reefs *u* and *w*. On the reef *u* there is a little islet covered with bushes. Cape Direction will then be passed, the little sandy islet covered with bushes and its reef being left to the East.

In passing Cape Direction, the bank off it and the detached Landsdown Reef, which is nearly two miles N.E. of the cape, must be avoided, and having passed these steer N. 20° W., leaving the reefs *y*, *z*, *a*, *b*, *c*, and *d* on the starboard hand, or to East, and the rocky island E.S.E. of Restoration Island to port or West; keeping this course for five miles beyond Cape Weymouth or Restoration Island, the long reef *e*, will be seen; then steer N. 40° W. along this reef until abreast of Cape Fair, where this reef terminates in a sharp point. From thence steer N. 35° W. to pass between East Piper Island and the reefs *h*, *i*, and *k*; then pass East or West of the reefs *l* and *m*, then West of Haggerstone Island, which is high and round on the East, the easternmost island of Sir Everard Home's group.

The anchorages between Cape Flinders and Cape Grenville are too numerous to mention. The N.E. end of every reef affords a good sheltered anchorage, but vessels should be cautious of anchoring near their shores on account of the current which is much stronger there

than half a mile from them, and the depth is generally greater. If the day is advanced and the breeze fresh Night Island should not be passed, for the anchorages between it and Piper Islands are much exposed to the sea. A vessel leaving Night Island in the morning will easily reach the Piper Islands or Margaret Bay by night. The anchorage off Night Island is gained by rounding the northern point and anchoring with it due East, distant one mile.

Margaret Bay is West of Cape Grenville. The anchorage East of it is off Sunday Island, in 6 fathoms and well sheltered, with the island S.E.; it is a good place for rendezvous. In rounding Sir Everard Home Islands, pass outside of them, to avoid the current which sets N.W. towards them, across the vessel's course. Having passed these islands the course is N. 52° W, or N. 54° W. for Bird Islands, and from these to *v* reef, about N. 22° W. (N.N.W.) The best and most direct track to adopt is to pass West of the reefs *v* and *w* (although there is a good passage between them), and when abreast of the West point of the latter the course for Cairncross Island is N. 15° W. for about eighteen miles. In this track the Hannibal Islands will be left to port and the Boydong reefs to starboard.

As there is no good anchorage between Cairncross Island and Cape York it will be better to bring up under this island for the night in 13 or 14 fathoms mud; the island bearing S.E. it must not be approached nearer than half a mile, for there the bottom is rocky.

Leaving Cairncross Island, steer N. 56° W. (N.W.b.W.) until abreast of Escape River *x* reef will be seen. Pass East of it on nearly a N. 26° W. course, and leaving Turtle Island to the West, this course will lead East of *z* reef and afterwards the Albany Islands, which should be passed to port.

The passage through the Possession Islands and Endeavour Strait is not adapted for large ships there being too little water about the Wallis Islands near Shoal Cape. The route by the Prince of Wales Channel round the northern end of Wednesday Island and then Hammond Island is preferable.

Prince of Wales Channel.—The reef *a* being passed, Wednesday Island will be seen. In making for this island take care not to approach the rocky islands at the entrance of the strait between Wednesday Island and Horned Hill, the N.E. point of Prince of Wales Island, on account of several hidden rocks a quarter of a mile from the shore. then round the northern point of Wednesday Island at half a mile and steer W. 9° or 10° S. to pass North of the rock off Hammond Island. From this steer S. 53° W. and when abreast of the S.W. point of Hammond Island a reef will be approached to the South of the track, and on which several rocks dry. Pass half a mile North of it. In this course the reef *d* will be avoided, which is generally, if not always, covered, and the depth throughout will be from 6 to 7 fathoms.

When the summit of Goode Island bears S. 30° E., steer W. 7° S. towards Booby Island. This course will clear Larpent Bank, and having passed it the ship will be clear of Torres Strait. Having passed Booby Island, by steering W. ½ S. or W. 9° S. will gradually increase

the depth of the water. North of these two routes, and West of Booby Island are several coral banks the positions of which are not well determined.

Satisfied of the superiority of the inner route over those through the Barrier Reefs, which have been generally taken for many years, Captain King says, I wish vessels would but try it, for the trial would end in its adoption.

The season in which Torres Strait is available is from April to October (the S.E. monsoon). The N.W. monsoon is accompanied by uncertain and cloudy weather, with rain and sometimes strong winds, against which it is impossible to make way without a great loss of time.

The passage along the N.E. coast of Australia is not subject to monsoons; the S.E. wind, with a little variation, blows on this coast nearly all the year. In the months of June, July, and August, it is sometimes, although not often, replaced by N.E. winds with cloudy and rainy weather; South of Cape Grafton (lat. 16° 51′ S.) these changes are less frequent. However the prevailing wind North of Break-Sea-Spit is S.E., and there are no difficulties for making a rapid passage.

(To be continued.)

Supplies at Flores,—*Azores.*

St. John's Lodge, Aylesbury, October 28th, 1859.

Dear Sir,—I shall be glad to avail myself of the pages of the *Nautical Magazine* to make known to the commanders of English ships how very useful the island of Flores may be to homeward bound ships. During a voyage from Madras some years back, we were off Flores in June with 180 invalid soldiers on board. The soup and bouilli procured in India had turned sour, so that they had been some weeks without fresh meat. Fearing that increased sickness might be the result, I decided to see what could be obtained at St. Cruz, on the N.E. part of this island. Land was sighted at daylight with a nice westerly wind blowing, which freshened and became gusty as we rounded the northern part of the island, so much so that I considered it would be well to shorten sail in time; but as we hauled round the N.E. point the sea became smooth and the wind lulled. A boat was alongside in a very short time, and after a few questions from Mr. M'Kay (son of J. M'Kay, Esq., H.M Vice-Consul,) as to where we were from, &c., he came on board, and executed all my orders quickly and well.

I cannot now remember the whole of the stores received, but the bulk was seven small bullocks, a pig, some sheep, several fowls, a very sweet kind of grass for the bullocks, some onions, potatoes, flour, &c., all of which were on board in a few hours, and the bill was only £29. So pleased was I with the result, that in another voyage with invalids

from Madras, having had much detention in the horse latitudes, we called at this friendly island. This was in August, and we came in round the South side, where, by the bye, there is a patch with only 4½ fathoms on it, the only sunken danger in the neighbourhood of the whole island, so far as I could learn. This time the wind being light we had some difficulty in getting near to St. Cruz, so I sent off my chief officer to order what we required. Some passengers took advantage of the opportunity to set foot on shore again. They returned charmed with the place and people, finding Mr. M'Kay and his family so agreeable, that one gentleman seemed to wish that he had missed the returning boat, and seriously talked of going to settle there.

In the meantime the ship crept up towards the town, which is well marked by a cathedral in a very prominent situation; and very soon my friend Mr. M'Kay appeared with all that we required. This time our wants not being great, we purchased five bullocks, &c., making up altogether a bill of £20. Not only did the fresh meat last us to England, but bumboats came off with cheese, fruit, onions, potatoes, eggs, &c., and these luxuries were to be seen adorning the soldiers' mess tables during the remainder of the passage.

There is anchorage very close in, but this would be waste of time. My last visit was, I think, in 1854; but not having my logs at hand I am not certain. On arriving in England I purchased Capt. Vidal's excellent plan of the islands of Flores and Corvo.

Time rolled on, and circumstances not taking me in sight of it, I had thought but little of Flores until our return home in the end of July of this year, when we fell in with the ship *Fitzjames*, bound to Liverpool. Her anchor having dragged off the very narrow bank of soundings which faces James Town, St. Helena, she had drifted to sea without procuring the necessary fresh provisions, and hence her crew were suffering sadly from scurvy. She had, moreover, sprung a leak, and the pumps had to be kept going. Fortunately we were able to spare her some fresh provisions, and whilst their boat was alongside, the happy thought came to Mrs. Toynbee that I might advise the captain to touch at Flores. This was done, for we were only two days' sail to the westward of it, and the following extract from Capt. Hamilton's letter to me well explains the result.

"The crew of the *Fitzjames* were at the time I had the good fortune to speak your ship suffering severely from scurvy, by reason of the want of fresh provisions. Especially do I thank you for the information you gave that fresh provisions were to be procured at the island of Flores, port Santa Cruz, a fact which I was not previously aware of. And it is my belief it is not generally known that at that island supplies can be had in abundance and cheap. The fresh provisions I got there were the means under Providence of restoring the health of my crew, enabling me to bring the ship to England; otherwise, I doubt if I could have brought her into port."

Capt. Hamilton was right as to the ignorance of many commanders of the supplies available at this island, for I have known a ship come into the English Channel whose crew and passengers (of whom many

were great invalids) had been living for days on sugar and rice. And a friend wrote lately to me saying, "I know a case myself of a ship running short off these islands, and the captain was afraid of them."* On these grounds I wrote to Capt. Hamilton for further particulars as to the supplies he obtained and their prices; also, if he could get men to assist his crew in pumping. To which I received the following reply.

"Although men could be had in any quantity to go whaling, (and at any price,) I could get none situated as I was, although I offered to pay any reasonable wages they would ask; and, if necessary, to give a guarantee to provide them with a passage to the United States or Australia."

"I got three bullocks, for which I paid twelve pounds, (we only consumed two on the passage,) we got plenty of excellent potatoes at 3s. per bushel, eggs at 5½d. per dozen, fowls at 12s. per dozen, pumpkins at 2s. per dozen, apples, onions, cucumbers, and other vegetables, equally reasonable. I had not even a chain bent while there, and the few hours we remained the weather was beautiful. Mr. M'Kay and family were still there, and inquired much about yourself and the good ship *Gloriana*. I received *every kindness, assistance, and attention* from them. One great object is, you can get everything you require in a very short time, say three or four hours."

In another part Capt. Hamilton repeats his thanks for the information, saying, that his crew recovered rapidly when entirely on fresh provisions, and that he had no doubt it was the means of saving some of their lives, "as many of them were very much exhausted, besides ten that were not able to move."

It may be that had Capt. Hamilton promised these men a passage to their own island again, or a lump sum in excess of their wages to help towards their return, he might have obtained their services; and it would be well if Mr. M'Kay would make known through your pages on what terms these men would have served the *Fitzjames*; though we must allow that a leaky ship full of exhausted men, who were foreigners to them, was no great inducement to them to sell their services at any price.

I consider that Capt. Hamilton was quite justified in touching at St. Cruz with no cables bent, because it was a last resource, and probably he had not physical force on board to bend cables and keep the pumps going; but as a rule I should think it wrong for a ship to go so near land without having an anchor ready, for there is anchorage, though very close in, and a sudden change of wind might endanger the ship and lives of all on board. The prices mentioned by Hamilton will surely suit the most careful of shipowners, and in these times they must be careful, or if their ships don't sink they will soon be sunk by them.

But I should not have done my duty to the inhabitants of this island if I did not call the attention of your readers to the absence of all imposition in their conduct towards this helpless ship and her more

* I know another.—*P. D.*

helpless crew. The prices charged were no more than what I paid, though Capt. Hamilton *must* have purchased had they asked three times as much. Again, and more than all this, he received every *kindness, assistance, and attention* from Mr. M'Kay and his family; so that the master of a ship wanting supplies may calculate on getting them at Flores, and on finding a family ready to give him assistance in any way in their power.

Some will probably think that St. Cruz can only be visited during a westerly wind when it is on the lee side of the island. The wind was West during my visits, and also during Capt. Hamilton's, at any rate it was West with us, who had passed a few hours before his visit. Still, in a moderate East wind it would be quite as available and the ship easier managed, for she would not be so much affected by eddy winds from the land, but might be turned to windward, keeping within a mile or two of the landing-place. But even supposing that the easterly wind is too strong for this; there is the bay of Fanaes on the western side of the island, mentioned at page 153 of the *Nautical Magazine* for 1842, by Mr. E. May, Master of H.M.S. *Skylark*, who gives an account of his having touched there. In this he says, "At this place by the assistance of shore boats about four tons of water were obtained in ten hours. The place abounds in poultry, sheep, pigs, vegetables of all kinds, and eggs, all very cheap, and were freely exchanged by the natives for old clothes. Those who came off to the ship were well dressed, clean, healthy people. The shore of the island is bold, and may be approached to the distance of a quarter of a mile. Leaving Fanaes, I would recommend vessels to run due West for two or three miles, to get clear of the high land to the northward of the landing-place, by which they would avoid being becalmed under the land when the wind is from N.E. to S.E., and would be able to run clear of the island."

I believe that at St. Cruz they are much quicker in watering than at Fanaes; for though we did not get any, I asked about it.

Now, as Flores is only a week's sail from the English Channel with a fair wind, ships, by taking account of their remaining stores before passing it, can tell very nearly if they are likely to require anything; but as this part of the sea is liable to several weeks of easterly wind, especially in the spring, why should not a homeward bounder, caught in one of these easterly winds, run back a few miles, and prevent the immense amount of suffering which may take place if the commander endeavour to hang on, in the hopes of meeting with some other ship that will assist him. Of course there are points where a commander must use his own judgment, doing what he considers his duty: but he will be none the worse for knowing that Flores has good provisions and kind hearts to help him if he is hard up. Trusting that your nautical readers may find this island as useful as I have, should they require such assistance,

I remain, &c.,

HENRY TOYNBEE,

Late Commander of the E.I.S. "Gloriana."

To the Editor of the Nautical Magazine.

Arctic Voyage of the "Fox."

The following narrative is the substance of that communicated to the Geographical Society by Captain M'Clintock, which will interest our readers, while a more complete account of the whole voyage is going through the press, and we understand will shortly be published by Mr. Murray, with the assistance of Captain Osborn, R.N.:—

We sailed from Aberdeen 1st of July, 1857, and bade adieu to Uppernavick, the most northern of the Danish settlements in Greenland, on the 6th of August. My object was to complete the search in the area left unexplored between the expeditions of James Ross, Austin, and Belcher, upon the North; of Collinson and M'Clure on the West; of Rae and Anderson upon the South; whilst its eastern boundary is formed by the western shores of Boothia. The portion of the earth's surface thus defined comprises an area nearly 300 miles square. Thirty-five dogs and an Esquimaux driver were obtained in Greenland as valuable auxiliaries in our anticipated sledge travel. On the 18th of August, when attempting to pass from Melville Bay to Lancaster Sound, through vast accumulations of drift ice, the ship was seriously obstructed, and finally became beset and frozen up for the winter; then commenced an icedrift, not exceeded in length by any that I know of. Being unable to travel to the land or set up a fixed observatory of any kind, and being impelled by the winds and the currents, we devoted to them our particular attention.

From all that I was able to observe during our drift down the middle of Davis Strait, the movement of the ice was almost entirely due to wind and not to current. We did not notice any indication of an under-current to the North: on the contrary, large icebergs which would have been influenced by it, drifted in our company from lat. 75½° North of the Arctic Circle. Throughout the winter, long cracks or lanes of water were formed at spring tides, and ofttimes closed with sufficient force to crush up their edges into long ranges of hummocks several feet high. Fortunately, our little vessel was never exposed to this ice action, although it sometimes took place within fifty yards of our position. During the autumn and early spring, about seventy seals were shot in the water spaces, affording a good supply of food for our dogs and oil for our lamps. It was not until the 25th of April, 1858, by which time we had drifted down to lat. 63½°, that we were able to escape out of the ice, under circumstances which will long be remembered by all on board. A heavy south-easterly gale rolled in such an ocean swell that it broke up all the ice, and threw the masses into violent commotion, dashing them one against another, and against the ship in a terrific manner. We owed our escape, under Providence, to the peculiar wedge-formed bow and steam-power of our obedient little vessel.

During the 242 days of our imprisonment the ship's position was astronomically determined on the average, twice a week, and her accumulated drift thus ascertained amounts to 1,194 geographical miles.

Having once more regained command over the *Fox*, our voyage was commenced anew. We directed our course to the Greenland settlements in the hope of obtaining supplies of fresh provisions; we met, however, with but little success, though what the Danish residents possessed they readily shared with us. Closely following up every movement of the ice, we succeeded in crossing Melville Bay by 18th of June, and reached Pond Inlet on 27th of July.

The native village Kapawroktolik, which I visited in company with Lieutenant Hobson and our interpreter, Mr. Petersen, was situated upon the North shore, about twenty-five miles up the inlet, and at the mouth of an immense ravine between lofty and precipitous cliffs. It was accessible only by sea, the ravine being entirely filled up by a glacier, which reached within a few hundred yards of the water. It was upon the narrow slip of intervening land that these strange people had pitched their summer tents. They told us that the ice within the inlet decays away every summer, but as long as any remains there whales abound. Several large ones were seen by us, and we found amongst the natives a considerable quantity of whalebone and many narwhal's horns, which they were very desirous of bartering for knives, files, saws, rifles, or wood. For six days we were in communication with these friendly people; and we satisfactorily ascertained that nothing whatever respecting the Franklin Expedition had come to their knowledge, nor had any wrecks reached their shores within the last twenty or thirty years.

Proceeding up Barrow Strait, we reached on the 11th of August Beechey Island, the scene of Franklin's first winter, and now the site of a house and store of provisions. Here is a cenotaph bearing inscriptions to the memory of those who perished in the last Government expedition, also a marble tablet to the lamented Bellot. In fitting proximity to these I placed a similar memorial appropriately inscribed to the memory of our lost countrymen in the *Erebus* and *Terror*. It was sent out for the purpose by desire of Lady Franklin. Having examined into the condition of the provisions and boats, both at this place and Port Leopold, in order to ascertain how far we could rely on them should accident deprive us of the *Fox*, and having failed to penetrate more than twenty-five miles down Peel Sound, in consequence of the ice extending across it, we sailed for Bellot Strait, and arrived there on the 20th of August. Bellot Strait is the water communication between Prince Regent Inlet and the Western Sea, now known as Franklin Strait; it separates the extreme northern point of the American continent from the extensive land known as North Somerset. Its shores are in many places faced with lofty granite cliffs, and some of the adjacent hills rise to 1,500 or 1,600 feet above the sea: the tides are very strong, running six or seven knots at the springs.

At the time of our arrival Bellot Strait was choked up with heavy masses of drift ice, and our attempts to pass through it not only failed, but were attended with great danger to the ship. As the season advanced, these obstructions were removed, so that on the 6th of Sep-

tember we sailed through, and made fast to some ice which remained fixed across its western outlet. From this date until the 27th of September, when the advance of winter made it necessary to remove the ship into a suitable position for being frozen up, we constantly and most anxiously watched every ice movement in Franklin Strait. In mid-channel it was broken up and drifting about. Gradually the proportion of water increased, until at length the ice which intervened was reduced to three or four miles in width; but this was firmly held fast by numerous islets, and withstood the violence of the autumnal gales. It was tantalizing beyond all description thus to watch, from day to day, the free water we so much desired to reach, washing the rocky shore a few miles southward of us, and to feel our utter inability to penetrate the barrier that separated us from it.

Whilst daylight continued, attempts were made to carry out provisions towards the magnetic pole, in order to facilitate the sledging operations of the ensuing spring, but these almost entirely failed in consequence of the disruption of the ice to the southward, and the impossibility of traversing so rugged a country. Lieutenant Hobson, already distinguished by his sledge journeys in the vicinity of Behring Strait, conducted these operations, and returned on board the *Fox* with his party in November, after much suffering from severe weather, and imminent peril on one occasion, when the ice upon which they were encamped drifted to seaward with them across Wrottesley Inlet.

Our wintering position was at the East entrance of Bellot Strait, in a convenient harbour, named Port Kennedy. It is almost at the junction of the limestone forming the low shore northward of Brentford Bay, with the lofty granitic land of the interior of the country and western shore, both northward and southward of Bellot Strait. Although vegetation was comparatively abundant, yet the frequent stormy winds which draw through Bellot Strait are probably a sufficient cause for the scarcity of animal life there. Besides our two Esquimaux hunters, Mr. Petersen and several sportsmen were almost constantly on the alert, yet, during our prolonged stay of more than eleven months, only three reindeer, two bears, eighteen seals, a few water-fowl and ptarmigan were obtained. Early spring journeys were commenced on the 17th of February of the present year by Captain Young and myself. Captain Young proceeded to carry a depot of provisions across Franklin Strait, whilst I went southward to the magnetic pole, to meet the natives and obtain, if possible, some information that might direct us to the object of our search. I was accompanied by the interpreter, Mr. Petersen, and one seaman; we took with us two dog-sledges.

On the 28th of February, when near Cape Victoria, we met with a small party of natives, who readily built us a large snow hut, and spent the night in it with us. We were subsequently visited by about forty-five individuals, and during the four days we remained amongst them obtained many relics of the lost crews, and also the information that several years ago a ship was crushed by the ice and sunk off the

north-western shore of King William Island, but that all her people landed safely, and went away to a great river, where they died. These Boothian Esquimaux were well supplied with wood and iron, once the property of the white men. With this important information we returned to the *Fox*, after an absence of twenty-five days of sharp marching, and unusually severe weather, the mercury being occasionally frozen for many hours together.

The result of this journey was also important to geography, since it completed the discovery of the coast line of the American continent. Early in April our long-projected spring journeys were commenced. Lieutenant Hobson accompanied me as far as Cape Victoria, each of us had a sledge drawn by four men, and an auxiliary sledge drawn by six dogs, this being all the force we could muster. Before separating we met two Esquimaux families in snow huts upon the ice, as is their custom from October until June, when seals, and perhaps an occasional bear, are their only food. During the summer months they resort to the rivers, lakes, or deer passes, and subsist on fish, venison, and birds. From these people we learned that a second ship had been seen off King William Island, and that she drifted ashore in the fall of the same year. From this wreck they obtained a vast supply of wood and iron.

According to my original plan of sledge-search, matured during the winter, Lieutenant Hobson was to complete the exploration of the North shore of Victoria Land, between Cape Collinson and Wynniatt's furthest; but in consequence of the information obtained from the Esquimaux, I directed him to search the northern and western shores of King William Island for the wreck, and to follow any traces he might find. Lieutenant Hobson, therefore, crossed over to Cape Felix, whilst with my own party and the interpreter I marched along the East shore of King William Island, occasionally passing deserted snow huts, but without meeting with Esquimaux until the 8th of May, when near Cape Norton, or as named in some charts Cape Smith; here we found a snow village, containing thirty or thirty-five inhabitants. They quickly gathered about us, exhibiting the utmost delight at our visit, and eagerness to answer Petersen's questions, but in consequence of their excited state, it was very difficult to understand them clearly. They had not been apprised of our approach, and their independent testimony exactly agreed with that which had previously been obtained. Bartering was commenced immediately, and continued with much spirit on the part of the natives. I purchased venison, seal, and salmon, to supply our wants, and all the relics of personal interest, such as silver spoons or forks, which they had. All the wooden articles they possessed, including a large sledge, were made of material obtained from the wreck. Had I the means of carrying them away, I would have purchased many more things. They pointed to Peel Inlet, and told us that one day's march up it, and from thence four days' overland, brought them to the wreck. None of them had been there for more than a year, and then but little remained visible above the ice. Their countrymen had resorted to it

for several years past in great numbers, and had carried off all that they could. Some few of these people had seen the white men on their march to the great river, and said that "many of them dropped by the way," but that this was not known to them at the time, nor until the following winter, when the bodies were found. Most of our information was obtained from a sharp-looking old woman, who screamed it out in answer to Petersen's questions, and was either confirmed or corrected by the listeners. I could not discover the slightest inclination to mislead us, or to hide anything they possessed from our view.

We were at length glad to get away from these good-natured but troublesome people, for the women and children could not resist the temptation to steal. The Mathison Island of Rae was found to be a flat-topped hill, forming the S.E. extreme of King William Island. Pursuing the native route, we crossed the low land behind it, and met with an Esquimaux family off Point Booth. They also told us that we would find some of their people upon the large island on the Great River, alluding to Montreal Island; yet none were seen there, nor any recent traces of them. These were the last Esquimaux we met with. Point Ogle, Montreal Island, and Barrow Inlet, were successively searched; but without finding any traces of Europeans, except a few scraps of copper, tin, and iron near an Esquimaux stone-mark.

Having now overlapped the ground searched by Messrs. Anderson and Stewart when they descended the Back River in 1825, and having no hope of meeting natives by proceeding further up it, I turned to the N.W. to complete the search to the spot where our countrymen first landed upon King William Island. It will be seen that my visit to Montreal Island was in the same time of the year, namely, the latter end of May, as that in which the survivors of the crews of the *Erebus* and *Terror* reached it; we saw it in its winter garb as they saw it, and any marks of cairns designed by them to attract attention, would have been rendered most conspicuous by the surrounding wastes of snow.

Recrossing Dease and Simpson Strait, we continued the minute examination of the southern shore of King William Island, without success, until near Cape Herschel, the western limit of Simpson's discovery, when a bleached skeleton was found near the beach, around which lay fragments of European clothing. The snow was most carefully removed, and a small pocket-book containing a seaman's parchment certificate and a few letters were found. Judging from the remains of his dress, this unfortunate young man had been either a steward or officer's servant, and his position exactly verified the Esquimaux's assertions, that "they dropped as they walked along." The skeleton lay at full length upon a level ridge of gravel, just above the beach, in a part which was almost bare of snow; for walking on, especially if the person was fatigued, it was far preferable to the ice whereon the sledges would of necessity have to travel. Simpson's cairn on Cape Herschel was next day examined; it had been disturbed, in fact the greater part pulled down, and the impression

left upon my mind is, that records were deposited by the retreating crews in this conspicuous and well-known position, but that they were subsequently removed by the Esquimaux.

I will now revert to the proceedings of Lieutenant Hobson. After separating from me at Cape Victoria, he made for Cape Felix, the North extremity of King William Island. At a short distance to the westward of it he came upon unequivocal traces of the Franklin expedition—a large cairn of stones, close beside which were three small tents, with blankets, old clothes, and other *débris* of a station, probably for magnetic or for shooting purposes; but although the ground beneath the cairn was broken into, and a trench dug all round it at a distance of ten feet, no record was discovered. The most interesting of these relics, including our national flag, were brought away.

Two smaller cairns were next found by Lieutenant Hobson as he continued his search, and on the 6th of May, at Point Victory, the extreme reached by James Ross in 1830, he pitched his tent beside a large cairn, which he then supposed to be the one built by that officer. Lying amongst some stones, which had evidently fallen off the top of the cairn, was found a small tin case containing a record: in fact, the record of the long lost expedition. By it we have been informed that in May, 1847, all was well on board the *Erebus* and *Terror;* that in the year 1845, the same year in which they left England, they ascended Wellington Channel to lat. 77°, and returned southward by the West of Cornwallis Island, and spent their first winter at Beechey Island. On the 12th of September, 1846, they were beset in lat. 70° 5′, long. 98° 23′ W., and here, in the packed ice, about fifteen miles off the N.W. shore of King William Island, they passed their second winter. Lieutenant Gore and Mr. Des Veaux, with a party of six men, landed and deposited the above record, and another exactly similar, which was found in a small cairn one day's march further South. Round the margin of the former of these documents much additional information was given, under date the 25th of April, 1848. The ships, it states, were abandoned on the 22nd of April, 1848, about fifteen miles to the N.N.W.; therefore they drifted southward, only twelve or fourteen miles, in twenty months. The survivors, 105 in number, under the command of Captain Crozier, landed at this spot, and built the cairn which now exists, upon the site of James Ross's cairn, which must have been taken down by the Esquimaux. Sir John Franklin died on the 11th of June, 1847, and the total loss by deaths in the expedition, up to the date of their landing, was nine officers and fifteen men. They intended proceeding on the morrow for Back's Fish River, and this record was signed by Crozier, as Captain of H.M.S. *Terror*, and senior officer, also by Fitzjames, as Captain of H.M.S. *Erebus*. Even this three day's march seems to have shown them how greatly they had overrated their strength, for here they threw away a vast quantity of clothing and stores of all sorts—in fact, all that was not absolutely indispensable. Lieutenant Hobson continued his search almost

to Cape Herschel, without finding any trace of a wreck or of natives. As he retraced his steps, he left full information of his most important discoveries for me, so that I had the advantage of knowing what had already been found.

After leaving Cape Herschel, and proceeding north-westward along the shore, I found the traces of natives become less numerous and less recent: and after rounding Cape Crozier—the West point of the island—they ceased altogether. When a day's march north-eastward of Cape Crozier I came upon a boat twenty-eight feet long, mounted upon a sledge of suitable dimensions. A note left here by Hobson informed me of his having discovered her five days before. It was at once evident that this fine boat had been prepared with the greatest care for the ascent of the Back River. In order to reduce her weight she had been cut down to the thwarts, and very light fir upper-works substituted, supporting a canvas weather cloth; and she had been fitted with a housing cloth that the crew might sleep within her, and thus obviate the necessity for carrying tents. After Hobson's party had dug out the snow which filled this boat, they found a large quantity of clothing and portions of two human skeletons. One of them lay beneath a pile of clothing in the after-part of the boat, and was probably the last survivor. The other lay in the bow, but both had been very much disturbed by wild animals. Two double-barrelled guns stood upright, and loaded as they had been placed, in readiness for use. Watches, silver forks and spoons, small religious books, and articles of all sorts were found, but neither journals nor pocket-books. Of provisions there remained chocolate and tea, but no biscuit or meat; there was also tobacco, wood-fuel, and ammunition. Now, as this boat was only sixty-five miles from the position of the ships when abandoned, it appeared to me most strange that she should have been deserted so early on the march, the more so as many precious relics, which might very easily have been carried away, remained in her. But, on a closer examination, I found that she had been returning towards the ships!

After mature consideration upon all that I have seen, I am of opinion that the abandonment of the *Erebus* and *Terror* had been contemplated for months previously to its execution; also that the whole crew had become affected by scurvy, and greatly debilitated. We know that Franklin's ships were cut off from all supplies of game for three consecutive winters, and that this is the only case on record of ships' crews subsisting solely upon their own supplies for so long a period. The *Investigator* was abandoned after the third winter, but her crew had been able to procure some valuable fresh food, game of different sorts, including about a hundred reindeer. She lost only three men, yet the whole crew were affected by scurvy. But the *Erebus* and *Terror*, before being abandoned, had lost twenty-four men, and therefore I conclude that the remainder of their crews were at least as seriously affected as were the people of the *Investigator*.

There are two important questions which have been so frequently put to me that I gladly take this opportunity to offer some explana-

tion upon so deeply interesting a subject. The first question is—whether some of the one hundred and five survivors may not be living among the Esquimaux? The various families, or communities, of Esquimaux met with by Rae, Anderson, and myself, at different times and places, all agree in saying "No; they all died." But let us examine for ourselves. The western shore of King William Island, along which they were compelled to travel for two-thirds of their route, is uninhabited, and all that is known to us of the mouth of the Back River is derived from the journeys of Back, Simpson, Anderson, and myself; none of us have met natives there, consequently it is fair to conclude that the Esquimaux but seldom resort to so inhospitable a locality.

Even much more favoured shores in this vicinity are but very thinly sprinkled with inhabitants, and their whole time is occupied in providing a scanty subsistence for themselves. In fact, their life is spent in a struggle for existence, and depends mainly upon their skill in taking seals during the winter, a matter which requires such long training, that no European has ever yet succeeded in acquiring it. My two Greenland Esquimaux tried various methods at Bellot Strait, yet did not succeed! and without dogs trained to scent out the small breathing-holes of seals through the ice, and through the snow which overlays the ice, I do not think even the Boothian Esquimaux could live. It requires not only that a man should possess a trained dog, but that he himself should be well trained in the only successful mode of seal-hunting, in order to subsist in this locality.

It is, therefore, evidently an error to suppose that where an Esquimaux can live a civilized man can live also. Esquimaux habits are so entirely different from those of all other people, that I believe there is no instance on record of either a white man or an Indian becoming domesticated amongst them, or acquiring tolerable expertness in the management of a kayak. With regard to the probability of procuring the means of subsistence independently of the Esquimaux, I will just state what was shot by my own sledge party—and we never lost a chance of shooting anything—during the journey along the lands in question, that occupied us for seventy-nine days, and covered nearly 1,000 geographical miles of distance. The sum total amounted to two reindeer, one hare, seventeen willow-grouse, and three gulls.

The second question is—Why have the remains of so few of our lost countrymen been found? It is, indeed, true that only three of the 105 were discovered, but we must bear in mind that from the time they left the ship they were dragging sledges and boats, and therefore they must have travelled almost constantly upon the ice—not upon the land; consequently all traces or remains there vanished with the summer thaw of 1848.

There is no doubt that many relics still remain strewed along the uninhabited shore of King William Island, beneath the snow; but as it was most carefully examined three times over, I cannot think that any conspicuous object, such as would be put up to indicate where

records were deposited, could possibly have escaped us. The summer at Port Kennedy proved a warm one, yet the ice did not permit us to move until the 9th of August, and the object of the expedition having been attained, we commenced our homeward voyage. On the 21st of September I arrived in London, having landed at Portsmouth, and on the 23rd the dock gates at Blackwall closed behind the *Fox*.

Occasional Papers of the Nautical Club.—No. I.

[At a meeting of old nautical friends and companions of other days it was at once agreed to forego preserving a record of the usual preliminaries attending the formation of a club. It was justly decided that they would only occupy time and space unnecessarily, while they might be allowed to discover themselves, along with the rules by which its members would be guided, as their proceedings appeared from time to time in the adopted pages of its historical receptacle the *Nautical Magazine* at the discretion of its Editor. It was merely decided that the club should be established as the *Nautical Club*, and that its papers should be communicated to that excellent work in recognition of the advantages derived by the members of the Club from the useful information they have received from that work in all parts of the world for the last quarter of a century, from the year 1832.

It was also agreed that such discussion of subjects past and present as should take place at the Club might, at the discretion of a majority of members present, be communicated to that journal; and it was considered that the diffusion of such papers, along with a selection of the papers read, would tend not only to prove the valuable and excellent character of the Club, but also, through the medium of their adopted journal, prove serviceable to their profession and to society at large.]

Among the subjects of discussion in the course of the evening were the Channel Fleet, the *Great Eastern*, and the Arctic voyagers, everything political being excluded, the proposer subjecting himself by the rules of the Club to the heavy fine of a champagne dinner for all the members.

The discussion on the *Great Eastern* seemed to be provoked by a letter stated to have been received from her, and written in the usual vaunting, eulogistic style, which excited not a little the amusement of the old Blue Jackets to whom it was read. The burden on the mind of the writer was full of praise as to her contempt for the small craft about her, a leviathan among the minnows, with a feeling appeal to her directors to let her go to sea. If she was to establish a character why was she not by the side of the Channel fleet in the late gale (not by that of the unhappy *Royal Charter*, she did not want a lee shore)—yes, by the side of the royal Channel fleet of England, taking her place there, and keeping it too, and sharing with those gallant ships the glory of contending with the elements (since they had no other enemy). Besides, why was it not for her, like them, to realize the glorious ideas of Byron, to—

"Walk the waters like a thing of life,
And dare the very elements to strife,

instead of lying ignobly idle at Holyhead, not inside the harbour it was true, for that she scorned to do, as it was unequal to contain her huge proportions. But she deeply felt her degradation to let England's wooden walls gather all the laurels of that gale, while her iron ramparts were still to remain untried. It was a glorious opportunity lost! If her strength was doubted look at the catastrophe gone into at Portland! was it not a sufficient proof of strength to come scathless out of that? Then as to her capacity for passengers,—who could ever doubt it when she could stow away, aye, almost a whole city? It was too bad on the part of her managers, and they even talked of making her a show ship in Southampton Water, instead of the waters of America or "the glad waters of the dark blue"—Mediterranean.

Such was the burthen of the complaint, which some attributed to Captain Harrison, but which others would not admit, considering him to know much more about ocean seas than the writer did, and that he had had something to do with the wise and wholesome decision of the directors, who considered that the object of the shareholders, and therefore that of the *Great Eastern*, was not to make war with the elements, but to make money; and as for walking the waters, &c., with Byron, she had far better walk back up the channel, leaving the glories of the Channel fleet to those ships for the present, and take the berth assigned her in the peaceful waters of Southampton River,—there to reign triumphant for a season over the yachts and other small craft, and submit for security's sake for a season, a winter season at least, to be the observed of all observers and even the subject of wonder and amazement to the "gay and giddy throng" of visitors.

Considerable entertainment was occasioned by the abovementioned remarks of the writer, who was set down as being some hot headed youth; and it was decided that in justice to the great ship the real cause of her going to Southampton Water should be recorded among the papers of the Club, as it had been given in the following extract of a letter from Mr. Campbell, the energetic chairman of the company, which, like everything he had done in his station, was vigorous and straightforward:—

"The reports circulated as to the reasons leading to the adoption of Southampton as the port of completion are equally without foundation. All the energies of the board from April to August were devoted to the completion of the ship in time for the American season, and but for the unfortunate accident (over which the directors had no possible control), the ship would have been in America in September, leaving for after completion that which could have been temporarily dispensed with. The delay consequent on making good the damage done by the accident deranged our plans, and two courses remained open for our adoption.

"The first was, to go to America, realise little by the voyage out,

and find when we arrived there that disappointment to the people of America and ourselves could have been the only result of visiting them at a time when they could not visit us.

"The next course was, to turn to account this time to the finishing of the vessel, and utilise in a central position the time so occupied by gratifying the interest taken in the vessel by our countrymen.

"This done, an early opportunity would be afforded the directors of further testing the vessel's sea qualities by a trip to the warm climate of the Mediterranean, which would ensure passengers, and prepare the public mind for that complete confidence necessary to obtain all the passengers and goods essential to her complete success on whatever voyage she might be sent; preparing her also, at the same time, for government employ, if so desired, and leaving the American trip to the more seasonable period of the year, for the most complete realisation of their and our wishes.

"The determination of a final and fixed port of departure will entirely depend upon the respective merits of the ports in this country, adapted, by position and safety, natural advantages and trade facilities, for the vessel."

Some curiosity was expressed among the members of the Club as to the reason why a vessel of the huge dimensions of the *Great Eastern* had been built. On which opinions were speculated, some attributing it to the effect of the commercial principle,—*Crescit amor nummi, &c.*, others to the determination that Britannia should ever "rule the waves," when the Secretary of the Club thought he could supply the reason from a speech which had been made about her at Holyhead he believed, and which ran thus:—

"Considerable misapprehension had existed with respect to the *Great Eastern* from the period of the formation of the original company, and also as to its object and purpose. Such misgivings, however, had never existed in the minds of those who, either in an engineering or a commercial point of view, had associated themselves with the enterprise.

"They saw before them a most successful company,* existing by the overland route with all the difficulties of transshipment, landing, and the impossibility of carrying goods. They saw that the greatest want of the age in reference to our distant possessions—India, China, and Australia—was the combination of carrying-power and speed. They saw that the annual increase of the carrying trade of India, China and Australia, representing a population of 600,000,000, or nearly one-half the human race, had wants and requirements which were very inadequately met by the existing service. They saw, at the time they commenced their enterprise, only a monthly communication existing with India, though it had since been changed into a weekly communication.

"They were fortified by the opinions of most practical merchants of this country, that if they could obtain the delivery of goods, with the

* Query, P. and O.—*P. D.*

intelligence of their shipment, they would secure the market, and reap the fruits of their commercial genius. They had arrived at this one fact, that since the introduction of the overland route all calculations of the merchant had been defeated. He ordered his goods to-day, but four months afterwards fifty times the quantity he had ordered were represented by intelligence in the market. He ordered them, and he was anticipated by intelligence, which, in these days, was equal to the presence of the goods. The great aim of their company was to do for India, China, and Australia what a lamented friend had done for America twenty years ago, when he connected that country with his by steam communication without stoppage. The difference in time was shown that would be occupied by a voyage of the *Great Eastern* to India, China, and Australia, as compared with vessels of smaller dimensions, effected in coal and other matters if a regular service of large vessels were adopted. We find that the system of subsidies has done this; that the average pace of the overland route is ten miles an hour. We find that would be great captains have been often fined for developing too great a speed, and making a passage quicker than the subsidised rate.

"Misconceptions have been afloat with respect to the construction of the *Great Eastern*,—that she never would be launched; that when she got to the river she would never leave it. We launched her; we have sailed her; we have met with an accident. We are told that we are now a mere show-ship; but we are on a commercial cruize, and we are looking about for good ports, and this, I think, is a very fair one, considering the hospitable reception we have met with from the worthy chairman and his co-directors of the North Western Company. No doubt they will do all in their power to make it the best port in Great Britain."

This was considered a satisfactory statement of the origin of the *Great Eastern*, since it had come from Mr. Campbell himself, the managing director.

At the conclusion of the above paper it was announced that the monster ship had taken in her moorings by noon of Friday the 4th of November in Southampton Water. "Better there than with the Channel fleet," observed a member, while grave looks and a shake of the head was noticed, with the remark, that, like the Emperor of Russia's fleet, "She was a very fine ship for very fine weather." Some oh! oh! here and there stopped further remark, as being unbecoming the character of the Club.

But the success of that vessel was left in very good hands, and there was something more important even than that, and so gratifying to the predominent feeling of the Club, so novel was it in the history of modern times in this country, that it was voted by acclamation the letter relating to the proceedings of the Channel Fleet in the late gales should be preserved in the records of the Club.

The secretary then read the following, which had appeared in the leading daily journals:—The ships that comprised the squadron under Rear-Admiral George Elliot, were the *Hero*, Captain Seymour, bear-

ing the Admiral's flag; the *Trafalgar*, Captain Fanshawe; the *Donegal*, Captain Glanville; the *Algiers*, Captain O'Callagan; the *Aboukir*, Captain Schomberg; the *Mersey*, Captain Caldwell; the *Emerald;* and the *Melpomene*, Captain Ewart. The ships remained in Queenstown a week.

On Saturday, 29th of October, the admiral received his orders to proceed with the fleet to sea. The harbour was filled with shipping, a fresh North wind blowing. The signal was made about 9h. a.m., "Up propellers," shortly followed by "Weigh; outward and leewardmost ships first." This was immediately obeyed; the *Algiers* led out under all sail, followed closely by the *Aboukir*, *Melpomene*, *Emerald*, *Mersey*, *Trafalgar*, and *Hero;* the *Donegal* remained in port in consequence of the illness of her captain. The ships sailed out in beautiful style, threading their way through a quantity of shipping.

Nothing occurred at sea worthy of note until Monday morning the 31st. On that day the winds were light. The fleet was formed in line of battle, targets were laid out, and the whole forenoon was devoted to gunnery practice. The practice was extremely good, notwithstanding a good deal of rolling motion. On that afternoon several heavy storms of hail and sleet came from the N.W., and continued during the night, with very variable winds. After quarters at sunset the topsails were double reefed, and courses reefed for the night. Variable winds still prevailed. Land was seen about the Land's-end and the Lizard Lights sighted at about daylight, 6h. 30m. a.m. The weather set in very dirty at S.E., with increasing wind and heavy rain. The third reefs were taken in the topsails about nine a.m., and shortly after the topgallant yards sent on deck; topgallantmast struck by signal; and also a signal, "Admiral will endeavour to go to Plymouth," "Form two columns; form the line of battle."

About ten a.m., Tuesday the 1st of November, signal, "Prepare to moor with bowers. Bend sheet cable." The wind increased to a fury, with torrents of rain towards eleven a.m., with very thick weather, the wind heading the ships off, so that it became very doubtful if the sternmost ships could possibly get into the Sound, although it was probable the *Hero* and the headmost ships could get in. Admiral Elliot then, with the spirit of a British Admiral, decided at once (although he knew his exact position, having made the Eddystone Lighthouse) to wear the fleet together and stand off and face the gale.

Although the leading ships were in good positions to wear, it was not so with those in rear of the line. The *Aboukir* had just passed the Eddystone; the *Trafalgar* and *Emerald* were still in the rear, the *Trafalgar* having been detained to pick up a man who had fallen overboard from the jibboom, which was executed with great skill. The *Aboukir* immediately wore, set her courses, and dashed to the windward of the lighthouse by carrying a press of sail, and weathered it half a mile, followed closely by the *Mersey*. The *Algiers*, *Melpomene*, and *Trafalgar* passed it very closely to leeward, as the Hand Deeps were under their lee. Added to these difficulties there was a

perfect fleet of trawlers, vessels unmanageable while their trawl is towing, so that it required the greatest skill to avoid running them down. What must have been the sight from the lighthouse,—these leviathan ships darting about like dolphins round it in the fury of the storm defying the elements, and the little trawlers with their masts bending like reeds to the gale!

The signal was made to get up steam to secure the safety of the ships. The ships then got their canvas reduced and stood off the land. The *Mersey* and the *Melpomene* furled their sails and got up steam, the former stalwart ship moving along like an ocean giant. The gale still increased until about three p.m., remaining very thick, with rain. About three it lifted, the wind fell, the sun shone; but the sea remained towering up and breaking. The barometer then stood at about 28·50 in. The *Hero*, *Trafalgar*, *Algiers*, *Aboukir*, and *Melpomene* were not far separated. Signal made, "Form the order of sailing in two columns." This was partially executed when in a squall the wind shifted to N.W. It then for some three hours blew a perfect hurricane, considerably harder than it had previously blown at S.E.

The ships stood up well. The *Hero*, dauntless as her name, appeared to take it easy. The *Aboukir*, close to leeward of her, carried one reef out of her maintopsail through the whole of it; and the *Algiers*, the *Trafalgar*, and the *Melpomene* were all doing well. The former eased up her topsail sheets in the squalls. The *Mersey* and the *Emerald*, it is supposed, had steamed into Plymouth, as they were not in sight. The ships kept in open order through the night; they wore in succession by night signal at about 1h. a.m., made the land at daylight near the Start Point, formed the line of battle by signal, got the steam up, and carrying sail came up Channel at about 11-knot speed, steamed into Portland, and took up their anchorage without the loss of a sail, a spar, or a rope yarn.

This appears highly creditable to newly-organised ships—come only a few months together, the senior not a year; and I hope that it will tend to show that our mariners of England are not in that decay that some old gentlemen in the House of Commons are so glad to point out at all times and in all seasons. A little quiet organisation—not a continual harassing and worry in shifting sails and spars and killing men, but a fair exercise at guns, sails, &c., will make our fleet a credit to the country and a safeguard to the nation.

The Club was glad to preserve this novel record of a Channel fleet among its papers, and considered that the following opinion of the leading journal should be preserved along with it:—

Great as is the cost of our navy, not a sixpence of the outlay will be grudged by the country if a corresponding return is found in the efficiency of the fleet and the security of the nation. Give us a good Channel squadron composed of such ships as weathered the great storm of Tuesday, and the money will be found without a murmur.

A scientific member of the Club observed that the shifting of the wind seemed to show that the gale was one of Redfield's circular

storms and that according to his view it would be found that the focus of it passed over the southern parts of England from West to East, but observations as yet were too few to decide its course.

The reading of this letter occasioned much animated expression in the Club of pleasure and satisfaction that once more England had a Channel fleet to be present at an invasion by an enemy!

Much sympathy was expressed at the Club at the unhappy fate of the passengers and crew of the *Royal Charter*, the former amounting to 470 souls, and in spite of the strength of iron vessels, the statement that she snapped in two like a tobacco pipe when on the rocks off Holyhead, was considered ill calculated to inspire confidence in iron ships. For wood it was observed floats, but iron disappears. It was the general opinion, although the coroner's inquest had attributed the wreck to accident, that the exertion of good judgment and sound discretion on the part of the captain would have saved all. Instead of persevering in braving the gale and rounding the Skerries, by which the North of Anglesea became a dead lee shore, had he sought refuge somewhere to the southward on the Caernarvon coast all would have been right. St. Tudwell Roads would have given him good shelter and a weather shore. The subject was concluded with the remark that had the captain intended it even he could not have placed his ship under the circumstances in a worse position. The Board of Trade intends to hold an inquiry, from which something may be elicited to account for why the ship "broke in two like a tobacco pipe," and to secure a stronger construction of these iron craft in future. It was a subject of remark among the members of the club that the boatswain's mate who was questioned so closely about the chart at the inquest knew less about rhumbs than rope-yarns, and had evidently handled more marline spikes than compasses, although the inquisitive querist did not seem to know that the former of these matters did not belong to his jurisdiction.

A general desire prevailed in the Club to record their sense of the energetic and undaunted exertions of that intrepid arctic voyager Captain F. L. McClintock, and his successful attempt to set at rest the fate of Sir John Franklin and his companions. His dangerous position in the winter of 1857–58 drifting in the ice while locked in the pack off Baffin Bay from which he was only released in the spring of 1858; his persevering exertions in exploring the portions of the arctic shores left unexamined by all the Government expeditions, deserved the reward which they had found, not only in bringing home the only *authentic record* which had reached us of where Franklin's ships had been so long locked up but the acknowledgment which he had received on the part of the Admiralty, his native town, and his fellow-voyagers (the latter by the presentation of a handsome gold pocket chronometer). They had seen an expression of sympathy on the part of the United States Government for the widow of the late chief of that ill-fated expedition, whose memory they revered, whose urbane demeanour as an officer, and whose kindness as a friend every one admired. But their sympathy was no less with the friends and relatives of his officers and

ships' company, whose condition they deplored as they contemplated those relics (brought home by Captain McClintock) which had opened afresh the wounds of years now gone by, and had brought them as it were once more in contact with the departed.

One more topic had occupied the serious attention of the Club, for it affected as they thought the very welfare of the metropolis. They were not to consider themselves as the Conservators of the Thames, for there was already a body of gentlemen employed as such with the Lord Mayor of London at their head. But they viewed with alarm the authorized intentions of a Board which were busy in realizing schemes for the discharge of the whole fertilizing sewage (when properly utilized) of London into the Thames—the once much-admired "silvery Thames." No experiments had been tried by the Board, they had adopted their favorite main drainage scheme, which it was said was to pollute the Thames from sources of filthy sewage at Deptford and Barking. A mode of applying it to a useful process was proposed last month in the *Nautical Magazine*, and another was received which should be preserved among their papers, from Mr. Glassford, but it was believed that it had met with the same fate as the former alluded to (that of Captain Heckford). The following was an outline of Mr. Glassford's plan:—

If we consider for a moment the vast sums of money which will unavoidably be absorbed in executing the very gigantic sewage works now in course of formation throughout London—which may absorb more millions than now contemplated—besides the large annual sum required to keep the whole in good working order—if we consider, also, the number of years which must elapse before these works are completed—whilst in the meantime the Thames, during each of the hot summer days, is hourly increasing its quantity of filth, and poisoning the air with its horrid unwholesome breath,—and if we consider, also, that fertilizing matter (worth to our agriculturists a million sterling per annum), according to all our highest scientific authorities, including Liebig, Hofmann, and others,—is still, after all this great expense and years of delay, only *thrown away* into the Thames, a few miles below London, *without the certainty of relief from the nuisance*, or *the shadow of a possibility of any return being ever obtained* for all the outlay and annoyance, we shall have a clearer perception of the enormity of this main drainage scheme.

He then says my plan is this:—First, To collect the excremental matters with such a limited and *measured quantity* of water as should make the subsequent operations for the recovery of the fertilizing matter *economically practicable*. Second, The conveyance of these matters and water through a system of pipes and sunk vessels to large reservoirs at a distance from town, where it is to be deodorised, and neutralized with oil of vitriol; then allowed to subside for a few hours. The effect of this treatment will be, that the *whole of the nitrogenous matter*—the most valuable constituent—is saved, and fixed in the form of sulphate of ammonia. Third, The liquid portion to be pumped into a system of boilers and evaporating vessels, where it is concentrated

into a crystalline mass, which is chiefly sulphate of ammonia, with all the other valuable salts contained in the urine. The agricultural value of which I propose now to reckon at £10 per ton. The more solid portion, collected by subsidence in the reservoirs, is pumped up separately, and conveyed into a series of presses or filtering machines, which separate the solid and insoluble portions from the liquid, and finally presents it in an almost dry, solid, and inodorous cake, containing the organic matter and insoluble phosphates of the solid excreta; the agricultural value of which I reckon at £4 per ton.

"The estimated value of the products of London would be as nearly as possible *six hundred thousand pounds* per annum, after paying all agency, carriage, and discount charges. I have estimated the annual cost of materials, such as coals and vitriol, and of labour, at nearly £237,000, and of interest on cost of necessary works, tear and wear, &c., at £170,000, which sums together amount to £407,000 of total expenses of all kind, and allowing very liberally for every possible charge, leaves a sum of nearly £200,000 annual profit, for the improvements—useful and ornamental—so urgently required—in this our crowded metropolis.

"As to the objections which may be made in reference to the mechanical difficulties of the scheme, I have to say that I apprehend no insuperable difficulty—certainly none that I should myself (although not a civil engineer) feel unwilling to undertake. In this country especially, we should be under no fear of easily overcoming any difficulties of a mechanical kind.

"Finally, As the best method of determining the worth of any scheme is to put it in practice, I would earnestly urge the advisability of making a trial on, say 500 to 1000 dwelling-houses, grouped together in the same locality, so that all the products could be economically conveyed and collected together at a short distance, and there operated on. These operations can be conducted upon any quantity and upon any scale, so as to yield results which would amply test the value of the scheme, and enable a clear and practical judgment to be formed. To do all this, from one to two thousand pounds would be amply sufficient, and in a few weeks from the commencement, the experiment would be in full work and yielding results.

"I think I have said enough to conivnce you that my plan is deserving of serious consideration and of immediate trial, so as to enable us to abandon the ruinous and mischievous practice of throwing our excreta into our rivers, of hoarding up at our own doors a constant source of annoyance and disease, and depriving our fields of the very best and most natural fertilizer in the world—a waste which we have to make good by the annual *expenditure abroad* of millions of money upon guano, bones, and other artificial manures.

Now it might be all very well for the Board in question to persist; asserting thereby that the saying did not apply to them, that it was "never too late to mend." But what was to become of the ships that were to float at anchor in the filthy outpouring of their main drainage scheme. In fact was it to be supposed that the sewage would not be

perpetually moving about in the river, poisoning the air as well as the water? It had been fondly hoped that we were about now entering on a period foreshadowed by Pope when he said

> The time shall come when free as waves or wind,
> Unbounded Thames shall flow for all mankind,
> Where nations enter on each swelling tide,
> *And find polluted waters by their side!*

The last line was not Pope's, for how could he imagine such a suicidal state of things as were preparing for us, and which was literally in a fair way of being realized. It was admitted that rivers were subject to *bores;* but they were of a health-giving description as they came from the sea. But the Thames had already been *bored* enough below water; and this *bore of sewage* above water would be found in their opinion of a more serious nature than any river had yet had. In fine with a *bore* below and such a *bore* above as was in store for it, it would be past all endurance!

Phosphatic Guano.

Professor Johnson, Secretary of the New York Agricultural Society, well qualified, has given the following on the increasing price of Peruvian Guano, and the fact, experienced by many farmers, that its continuous and exclusive use is followed by impoverishment of the soil, has led to numerous explorations with the view to discover new sources of the cheaper phosphatic guanos. These have been found in various localities, and are of two kinds. The first kind comprises the long known Saldanha Bay and Bolivian guanos, the so-called Pacific Ocean and Mexican guanos, and the more recently discovered guanos of Jarvis Island, Baker Island and of the Kooria Mooria Islands.

They occur in rainy regions, consequently their soluble salts, and especially the nitrogenous ammonia-yielding matters are mostly removed. The best kinds are chiefly composed of phosphate of lime with some organic substances, but the poorer samples contain sulphate and carbonate of lime and sand, often in large quantity.

The other kind of phosphatic guano is represented by the Columbian guano, which is reported to come from the islands of the Caribbean Sea. This substance is a rock, and contains no organic matter. Some specimens of it are nearly pure specimens of phosphate of lime; others contain no lime, but are phosphates of iron and alumina, mixed with considerable sand. On the west coast of Africa a similar substance has been discovered.

In the last year or two, the circulars of the companies which manage the enterprise of bringing these fertilizers into the market, have been widely circulated among our farmers. Nobody can deny that the phosphatic guanos are an excellent fertilizer, capable of producing all the good effects of burned bones; but they are inferior to Peruvian guano, and inferior to the dust of unburned bones or to superphosphate of lime.

When we say that a body is a good fertilizer, we speak in a general sense. When we say that Peruvian guano is the *best* fertilizer, we mean that it, more than any other manure, contains those ingredients, which on the whole are most lacking in and most expensive to supply to the soil. When a manure becomes a commercial article, it acquires a commercial value, depending upon what it can be bought and sold for, entirely independent of any other use, though in most cases growing out of another use. Diamonds are the most costly, and commercially the most valuable articles of merchandize, and yet their value is only conventional and fictitious. They have few uses, and the most expensive are the least useful for any but for trading purposes.

To the dealers in manures, Peruvian guano is worth 60 dollars per ton, and Baker Island 40 dollars per ton, or just as much as he can get for them. He can get 60 dollars for the one and 40 dollars for the other, because farmers having used them at these prices, are satisfied that these are their real worth for producing wheat, corn, grass, &c. But manures like diamonds have often a fictitious value. The proper commercial value of the manure is the price which *many* farmers can afford to pay for it. It is the figure which may be *generally* agreed upon.

The true relative value of Peruvian and phosphatic guanos as agricultural, not as commercial articles, is what is established, not by the experience of one farmer or of one district, but in an average expression of the experience of many farmers in many—in *all* districts. The wants of different soils are so various, that in one locality Peruvian guano may be a most efficient manure, and the phosphatic guanos of no use, while elsewhere *the phosphatic guano is the best in all respects.* The first question with the farmer before purchasing largely of any manure, is to settle what is its fertilizing value on his soils.

When we take a comprehensive view of agriculture, and compare the teachings of all experience and of all science, there is no refuge from the conclusion that neither for sands, loams nor clays, neither for wheat, clover nor turnips, for no soil and no crop is there any one special and unfailing fertilizer. The plant, in its maturity, is the result of the favourable union of a number of conditions, among which are seed, warmth, moisture, light, carbonic acid, ammonia, potash, soda, lime, magnesia, oxyde of iron, phosphoric acid, sulphuric acid, &c., and if one of these fail the plant fails. That one of these conditions which is naturally wanting in any locality, but may be supplied by art, gets the credit thus of being the most important. In Greenland it is warmth, in Sahara moisture; on this farm ammonia, on that phosphoric acid; here lime, yonder potash.

It constantly happens that a manure which was once highly efficacious, ceases to produce marked effects, while another fertilizer, long disused, comes again into favor. This is easy to understand, and must occur wherever farmers have got to rely on anything but stable manure, or something that, like it, yields to vegetation all the forms of plant food.

The true system of manuring is to know all that the plant requires,

and to supply all that the soil is deficient in. This supply must be kept up constantly and symmetrically. The scientific farmer does not dose his soil a series of years with some, and then turn to guano, and then to plaster, &c., but each year, or during each rotation, he sees the crops are provided with all they need. Such dogmas as "ammonia for wheat, and phosphates for turnips," have with him only a local value. He believes them to be true only when they are proved true.

Nautical Notices.

Particulars of Lights Recently Established.

(Continued from page 604.)

Name.	Position.	Where.	F. or R.	Ht. in Feet	Dist seen Mls.	Remarks, &c. [Bearings Magnetic.]
45. Cape Schank	Australia	38½° S., 144·9′ E.	Ffl.	328	28	Est. 30th June, '59. A glare of light for 10 seconds is preceded and followed by darkness for 25 seconds every alternate minute. Within six miles the eclipses will not be perceptible.
46. Wilson Promontory	Ditto	39° 8′ S., 146° 23′ E.	F.	342	24	Est. 15th July, '59. *(a.)*
47. Portland Bay	Ditto	38° 22′ S., 141° 30′ E.	F.	..	..	Est. 1st Sept., '59. On Battery Hill, and Red light of jetty now Green.
48. Port Phillip, Gellibrand Point	Ditto	Hobson Bay, entrance	F.	40	10	Est. 25th July, '59. *(b.)*
Port Albert, La Trobe Is.	Ditto	38° 46′ S., 136° 48′ E	Ffl.	..	..	Est. 1st Sept., '59.
Middle Island in Lady Bay	Ditto	38° 26′ S., 142° 22′ E.	F.	..	..	Est. 1st Sept., '59. *(c.)*
Port Fairy, S.E. point of Rabbit Isl.	Ditto	38° 24′ S., 142° 19′ E.	Ffl.	..	..	Est. 1st Sept., '59. Flash every three minutes.
49. Bramo Island	Baltic	.....	F.	101	17	Est. 15th Oct., '59. Lights the horizon from N.W. round by North and East to S.W b.S.
50. Waterford	Ireland	.....	..	..	..	Hook Tower painted with alternate red and white bands.
51. Cape Sourop lower light	Revel, Baltic	59° 24′ N., 24° 26′ E.	F.	28	10	Est. 27th Sept., '59. *(d.)*

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

(a.)—Directions.—Vessels steering through Bass Strait, or from Port Phillip, bound eastward round Wilson Promontory, may first see the light through the space between Cleft Island and the southern Glennie Island, bearing E.N.E.; as they proceed to the southward and eastward it will be eclipsed for a few degrees by Cleft Island; when it bears N.E. the channel between the latter island and Rodondo Island will be open, and they may steer direct for the promontory.

Vessels to the eastward of the Seal Islands, and bound round the promontory, sighting the light bearing to the southward of S.W., will be to the northward of the fairway, and should haul out until the light bears S.W.b.W.: by keeping the light on the latter bearing it will lead clear of the Cliffy and the other Seal Islands.

(b.)—The light-vessel has one mast, surmounted by a ball; both hull and ball are painted red. The vessel lies in 4¼ fathoms at low water, with Point Cook bearing S.W.¾ W., 8 miles; the old lighthouse on Gellibrand Point, N.b.W.¼ W., 5¼ cables' lengths; Sandridge sugar works, N.N.E., 2 miles and 1½ cables; and the white buoy off St. Kilda Bank, N.E.b.N., 1 mile and 2 cables.

This light-vessel will be replaced on or about the 1st day of January, 1860, by a new vessel, which will exhibit a *white revolving* light. Full particulars will hereafter be given.

(c.)—On and after the 1st day of January, 1860, a small *fixed red* leading harbour light will be exhibited from a tower, to guide vessels in clear of the outer reefs; it will be visible from a vessel seaward when bearing between N.W. and North. The tower stands a little above high-water mark, in line with two stone obelisks, which kept in one, bearing North, will lead into the anchorage.

(d.)—In order to distinguish this light from the light exhibited from the stone lighthouse on Cape Sourop, the latter will be called the upper (higher) light, and the former the lower light of Cape Sourop. The two lights in line, bearing E.b.N.¼ N., mark the middle of the channel into Revel Road, between the South end of the reef extending off the S.E. end of Nargen and the North extreme of the middle Ground.

For the guidance of vessels navigating the eastern part of the Gulf of Finland, a wooden tower has been erected upon the central hill on the island of Stenskär, in the form of a quadrangular pyramid. It is 83 feet in height from its base, 97 feet above the mean level of the sea, and should be visible in clear weather from a distance of 11 miles. Its position is lat. 59° 49′ 10″ N., long. 26° 21½′ E. of Greenwich.

Directions for the Coasts of Sind, etc., and Approach to Kurrachee Harbour.

General Remarks.—Masters of ships leaving England, or any port, bound for Kurrachee, will do well to bear in mind that during the months of June, July, and August, and part of September, no ship should arrive off Kurrachee with a greater draught than seventeen feet, as ships more deeply laden than that are apt to bump on crossing the bar, and do serious injury to themselves.

June, July, and August at Kurrachee are the S.W. monsoon months, when there is often bad weather, and always a troublesome sea. Ships arriving, or expecting to arrive, off Kurrachee during the above months, should not anchor in the Outer Roads, if it can possibly be avoided,* by keeping off and on until the high water time permits their crossing the bar.

The depth of water on the tail of the bar is always signalled to every ship, on arrival, from a small flagstaff on Manora Point, a little to the right of the high flagstaff: and, if practicable, a pilot is always sent off to pilot ships over the bar to the anchorage.

* Many ships have lost their anchors by anchoring in the Outer Roads during the S.W. monsoon.

Ships arriving off Kurrachee from the middle of September to the end of May may draw as much as nineteen to twenty feet, but not more.

There are two channels over the bar into the inner anchorage; the Eastern or deep water channel, and the Western or inner channel: the latter can be used with safety throughout the S.W. monsoon by vessels not drawing more than sixteen feet, the least water in it being ten feet at low water spring tides.

Vessels from London, or from the westward of Kurrachee, bound to the latter port, should not care to make the coast of Sind and Kutch, or any of the contiguous land whatever, previous to sighting Kurrachee Lighthouse; but should they do so, and find they have to beat up to Kurrachee, they will find the entire coast, with one or two exceptions, which are hereafter specified, a perfectly safe one to approach.

From Diu Head to Kurrachee the coast is divided into three parts: Diu Head to Dwarka is the West coast of Kattywar.

From Dwarka to Juckoo we have the entrance to the gulf of Kutch; and any vessel bound to Kurrachee, or even out of Kurrachee (unless bound into the gulf of Kutch), has no right, on any account whatever, to go inside of a line drawn from Dwarka to Juckoo.

To the southward of the Lukput River the coast is within the territory of Kutch, and all to the northward of that river is the coast of Sind.

As correct charts of all these coasts have been published, and are now to be had in London, it is not considered necessary to give the latitudes and longitudes of the different ports on the coasts, as it is very seldom they are visited by ships other than the native craft of the country.

The West coast of Kattywar runs about N.W. and S.E., with bold soundings off its entire length, except a small patch of 2 to 3 fathoms a few miles West of Diu Head (*vide* chart.)

No vessel should approach this shoal under 12 fathoms, which is about one mile from its southern edge.

The general character of the West coast of Kattywar is low, with a sandy ridge fronting the sea. There are a few hills visible along the coast. The Barda range lies N.E. twelve miles from Porebunder, and may be seen twenty-five to thirty miles off. Junaghur Hill is in 21° 31′ 48″ N., and 72° 32′ E., of a conical form, 3,837 feet high, with three small peaks on it, and may be seen all along the coast from Diu Head to Porebunder.

As a general rule, no sailing vessel should come nearer this coast than 20 fathoms by night or in rough weather; or under 12 fathoms by day in fine weather.

Off the entrance of the gulf of Kutch is a small patch called the Lushington Shoal, having only 3 fathoms on it; and during the S.W. monsoon the sea breaks on it. Great care should be taken in approaching this danger.

From above Juckoo, the coast is pretty safe, and may be approached to within 7 fathoms, until you reach the Muneja Bank.

The Muneja Bank extends six to seven miles off shore, from lat. 23° 55′ N., long. 67° 27′ E., to lat. 24° 11′ N., long. 67° 15′ E. It is formed by the alluvial deposits of the River Indus, which, in 1854, was navigated by the Hujamree Channel, but the waters have since forced their way to the southward, through the Kookiwari Mouth.

The western edge of the bank is very steep, having 5 fathoms at one mile, 8 at two, and 10 at three miles' distance. The flood tide rushes out strong, causing a high ripple, which would very probably be mistaken at night for shoal water, particularly as the muddy particles give the water a whitish and sometimes a luminous appearance.

During the inundation the water is frequently fresh at the mouth of the river at half ebb. The flood tides are not strong.

The coast above the Muneja Bank up to Kurrachee is very safe to approach during the fine weather, and vessels may go safely into 5 fathoms by day, and 8 at night; but during the S.W. monsoon months, it would be prudent to avoid getting in too close, partly because there is a set te the S.E., and partly because the wind is liable to lull occasionally, and thus a vessel might get into difficulty.

The deep-sea or outer soundings along the entire coast from Diu Head to Kurrachee are very accurately laid down, and in cloudy foggy weather, when observations for latitude and longitude are not procurable, a little attention to the soundings will enable the navigator to fix the position of his ship with great nicety. The most remarkable feature in the soundings is the Swatch, in lat. 23° to 23° 45′ N., and long. 67° to 67° 35′ E.

(To be concluded in our next.)

Directions for Apaiang: *Gilbert Islands: Pacific.*

In approaching the island either from the N.E. or South, every effort should be made to pass through the channel between Apaiang and Tarawa, (Knox Island,) about eight miles in width, from the East, keeping close to the S.E. extremity or bend of Apaiang, as a strong current generally sets to the West.

Here the cocoa-nut trees, which have been in sight on the eastern side, terminate, and a reef commences which extends for four or five miles to the N.W., when it is interrupted by an *islet* covered with cocoa-nut trees. On this reef, two-thirds of the distance from the termination of the main land, to this islet, stands a *lone tree*. Midway between this tree and the main land lies the windward channel or passage to the lagoon, distinctly marked by a cluster of rocks, generally above water, lying on the starboard or S.E. side of the channel as you enter. Directly opposite this channel, or rather in its mouth, is an *excellent anchorage*, in from 5 to 8 fathoms. Its width an eighth of a mile.

Just within the channel is a bar with 3 fathoms water at high tide. The lagoon then speedily deepens into 10 and 15 fathoms. The di-

rection for entering is N.N.E. by compass. From this anchorage ready communication can be held with the main land, distant one mile S.E. The *mission premises* are near Koinaua, one-half mile S.E. from the village (pronounced Ko-ee-now-ah). This is the capital of the island, and bears due North from the channel, distant about eight miles directly across the lagoon.

There is also another *good anchorage* half a mile to the N.W. of the islet to which I have referred, opposite the leeward channel. This channel is obstructed occasionally with sunken rocks, while the windward one is quite free. The depth of the two is the same. Still quicker and more easy communication would be held from the windward channel, from the fact that generally a boat might make the run in both directions with a sail. Water can be obtained at the island. The lagoon also furnishes an excellent place for coopering.

PHILIPPINE ISLANDS.—The port of Iloilo, in the centre of the southern group of the smaller Philippine Islands has been opened to foreign trade by the Spanish government, and is probably destined before long to become well known in commercial enterprise, although at present there are scarcely half a dozen merchants or ship owners here who ever heard of the place. Iliolo (or Iloylo) is the chief port of the small but fertile island of Panay), which contains a population of about 700,000 inhabitants, and, together with the neighbouring islands, of which it is expected to become the commercial depot, the population may be estimated at 2,000,000. Besides varieties of eastern produce, of lesser importance, with which we are familiar from our connection with Singapore, Iloilo is expected eventually to export largely sugar and hemp to a considerable extent, and thus open a direct trade not only for shipment of raw produce to England, but for importing and distributing among the neighbouring islands a proportionate amount of British manufactures.

VARIATION OF THE COMPASS.

RESULTS OF MAGNETIC OBSERVATIONS—*at the Royal Observatory, Greenwich, in the year* 1858.

Mean monthly westerly declination, deduced from four observations on each day, corrected for ordinary diurnal inequality.

January.....	21°32′ 47″	July.....	21°28′ 28″
February.....	21 32 14	August	21 27 24
March.....	21 32 31	September	21 26 43
April	21 32 26	October.....	21 25 33
May	21 29 16	November.....	21 29 45
June	21 27 34	December.....	21 28 40

Mean for the year..... 21° 29′ 26″.

Mean dip for the year, deduced from 105 observations.... 68° 25′.

G. B. AIRY,
Astronomer Royal.

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