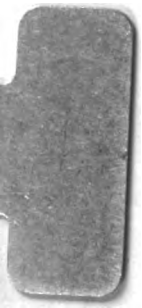

NEW SERIES.

No. I, JANUARY.

NAUTICAL MAGAZINE.

CONTENTS.

Communications for Editor to be Addressed to care of
MR. J. D. POTTER,
Admiralty Chart Agent,
31, POULTRY, E.C.

The Seas that join

the Nations they divide.

VOLUME XX.

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THE

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FOR 1871.

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ON SUBJECTS CONNECTED WITH

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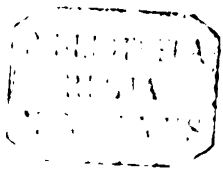

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THE

NAUTICAL MAGAZINE.

NEW SERIES.

JANUARY, 1871.

EDITORIAL ADDRESS.

THE good old ship the "Nautical" has now for close upon forty years made her monthly voyages, freighted, it may truly be said, with cargoes which have been of great value to the maritime community of our Country.

Guided by the veteran knowledge and wise judgment of the well-known officer who bade his many good friends an editorial farewell in the last number of the magazine (and who now retires from active command to spend, it is hoped, in peace the remainder of an honourable and useful life), the good old ship has made prosperous voyages and has gained a good name among nautical men. She has ever been kept clear of the troubled waters of politics, and the rocks and shoals of party or personal feelings of all kinds, and with the fair wind of public favour has kept steadily on her course, her voyages having been always made with the worthy motives of the advancement of navigation, the welfare of mariners of every grade, and the safety of all who travel across the seas.

But it will be well to speak more plainly on the subject of the Magazine.

The Editor feels called upon to put before subscribers and maritime men generally some sort of programme as to what may be expected of this New Series.

It is intended to make certain changes in the magazine which are in a measure necessitated to bring it more into

harmony with the spirit of this advancing age; and these changes will, it is confidently hoped, have the effect of maintaining the high character of the work, of enlarging its usefulness, and rendering it still more valuable as an instrument for the diffusion of nautical information in all its branches.

The Editor is much gratified at being enabled to announce that he has the promise of assistance from numerous men of mark in the nautical profession.

Hydrography will continue to be an important feature in the work; the information will be obtained direct from head-quarters and will be so arranged as to be of the greatest use to the mariner, and may be trusted to as a reliable and lasting record of information essential to navigators.

The scientific element of navigation will be brought prominently forward in the pages of the magazine.

A new feature will be the introduction of articles, etc., intended to minister to the moments of leisure or relaxation of the sailor. All work and no play is said to make even "Jack" a dull boy, so now and then will be published papers of an interesting or amusing kind, not necessarily on nautical topics; or a tough old yarn will be introduced in the form of a serial story. In fact a strong endeavour will be made to render the magazine useful and entertaining, adapted alike to the requirements of the state-room or cabin and the lower deck or forecastle.

The size of the magazine will not be limited, but will be adapted to the amount of interesting or useful matter which may be at the Editor's command each month.

Nautical men are invited to co-operate with the Editor, and to send to him any particulars which may be useful to the seafaring community. All letters containing enquiries on nautical subjects will receive careful consideration, and will be promptly replied to in the pages of the magazine.

With these changes it is hoped that the magazine will continue to be animated by the spirit which has hitherto made it the sailors' friend, and that its original high purposes may never be subordinated to unworthy ends.

The friendly support and co-operation of the nautical community will maintain the *prestige* of the Nautical Magazine

and achieve for it still further success; and the Editor will esteem himself peculiarly favoured if he can so propitiate all classes of maritime men that, under his direction, the Magazine may grow in popular favour and usefulness, and may thus in some slight degree be a means of adding to the honour and prosperity of England, and to the welfare of humanity at large.

WANTED, TWENTY THOUSAND POUNDS!

Who amongst us does not want this sum for his or her special benefit? And do not our hospitals, churches, schools, missionary societies, the fund for the sick and wounded on the Continent, and a host of other organizations that profess to minister to some of the ills that flesh is heir to, all stand in need of some such an amount as we have referred to? Of course they do. But the identical sum we have named is declared to be still wanting to complete what is required to provide sufficiently for every widow and orphan, left so by that national calamity, the loss of H.M.S. *Captain*.

We can fancy Mr. Holdfast, of the City—and there are a great many of that name, not only in the city but elsewhere—on being applied to for a contribution to help to meet this want, rather indignantly replying, "I don't see why I should be called on for this, the officers and men are paid for the risk they run, and they ought to make provision in proportion. I cannot be supposed to insure their lives. Heaven knows we pay enough for the navy, ten millions a year, sir! is no joke! I really must be excused." And friend Holdfast bows the applicant out of his office as though he had been insulted, buttons up his pocket as if the whole ten millions had come out of it, and turns to peruse a contract he has just concluded for supplying the navy with holy-stones, out of which he hopes to clear something near the identical sum wanted.

In the main we agree with Mr. Holdfast's arguments—he ought *not* to be called on—the officers and men *should* make provision in proportion to the risk—ten millions a year *is indeed* no joke, and it *is* the business of Government to see that right and justice should be done in this matter.

We have given our mite to the "*Captain* Fund," and would it were equal to the need, but at the same time, we are convinced

that the state of things which necessitated the gift is wrong, and are of opinion that provision should be made to remedy it.

But in order that the state of things as existing may be thoroughly understood, we propose to direct attention to the following points: first, the pay of officers of the Royal Navy; secondly, what they have to do with it; thirdly, why they, as a class, do not make adequate provision for their families in their lifetime; and lastly, what provision Government makes for the widow and orphan.

First, with regard to the officers' pay. The old adage, that "although a man may be bred to the sea, it does not follow that the sea should be bread to him," is more true than is generally imagined, and as we do not wish to tire our readers with an array of figures of the full-pay of each class, or the half-pay, not only of each class, but sections in all the letters of the alphabet from A to Z (which would puzzle a Philadelphia lawyer), we shall take but one class as a type of the whole, which will be quite sufficient for our present purpose. We propose, therefore, to follow the career of a naval officer from a cadet to above the average height reached, as an example. We will assume that the lad's "father was born before him," and able to pay handsomely for all the cramming now required to make a boy—we might say "little man"—of thirteen, sufficiently up to the mark to compete with other little men for his first entry. If successful, he at once mounts his uniform and becomes an officer of the Royal Navy. Paterfamilias, however, is not relieved of his burden; £40 to £70 a year is still needed to maintain the young officer as a gentleman, in addition to the usual "fits out" of clothing, travelling expenses, etc., and he is scarcely worthy of attention as a "bread winner" until he becomes a sub-lieutenant. It is then just possible, after a good replenishment of his wardrobe to meet his exalted rank, that he may, if he be steady and not given to going on shore or billiards, manage to exist on his pay. Unfortunately, such virtues are not very general in young men of from nineteen to twenty-three. So it is difficult to imagine that the generality do not again trouble their fathers.

As a sub-lieutenant, his pay is £91 a year, out of which he has occasionally to replenish his kit, for the buttons of his coat tails, in spite of his efforts to the contrary, will gradually creep up his back, and Miss Nancy with her brawny black arm will beat his shirt to an ornamental fringe after three times wearing, for which beating he has to pay twice as much as you, Mr. Holdfast, pay for yours without the ornamental work; then he has to pay his mess, his servant, his hammock man, etc., so that at the end of the month,

when the poor fellow sits down to see what surplus he has for a cruize on shore, he finds it is such as will keep him extremely straight, and effectually prevent any great excess of youthful depravity.

But hurrah! "here's a letter on H.M.S. from the Admiralty with

> **"A seal as large and as flat**
> **As the large cockade on his large cocked hat,"**

and our "sub" is a full blown lieutenant with £182 a year, with the right to mess in the Wardroom; but (oh those buts!) the big letter contains his promotion "for rank only," there is no appointment to a ship; and this means, if on the home station, his packing up his traps, betaking himself to the nearest railway station, and from thence to his paternal roof and half-pay of £73 a year, nearly £20 less than he had when serving as a sub-lieutenant. If abroad, that sum for the year is greatly reduced by his having the privilege of paying two-thirds of his passage home, and if from China it would be a nice calculation to arrive at the amount left for him to exist upon during this usual year of probation, and to fit him out as a lieutenant. But once on board a ship again, he is in the full possession of a cabin, a position and £182 a year: again his mess, his washing, *necessary* wine bills, etc., at the end of his month leave him but a small surplus; still we will allow it does leave him with a surplus, and with great economy he can therefore live as a gentleman.

Alas! that officers in the navy are but human and not gods, although by the way, if we rightly remember our Classical Dictionary, the gods themselves had their loves and their failings; absence from female society, sometimes for long periods, causes them to be very susceptible, and as they know little about house rent, butchers' bills, and monthly nurses, in their simplicity they are easily caught, and when caught, good Mr. Holdfast, we are proud to say they are too honourable to haul off, and an officer's plighted word, that when he becomes a commander he will marry, is pretty generally kept.

Our lieutenant's engagement makes him think, makes him steady, and perhaps somewhat stingy. It is something to see him on shore! And then he only goes for a walk, returning "as steady as a pump bolt" in the dinner boat; wine does not agree with him after dinner; in fact, he is saving up his monthly surpluses: his £182 a year goes on no more and no less all the time he is a lieutenant, excepting he happens to be senior lieutenant, or obtains the command of a gunboat, in which case his pay is magnificently supplemented by

the addition of from one shilling and sixpence, to three shillings and ninepence per day. Happy man then, for if he could live under £182 a year before, at least part of the command money is a clear gain, and will ensure him happiness with his dear Rosaline—when he gets his promotion.

There are certainly little drawbacks, such as, intervals of half-pay, on four to eight shillings a day, which rather entrench on the savings. Accidents too, will occur even on board ship, clothes get spoilt with salt water, and the gilt is literally taken off the gingerbread by smoke, soot, and steam; climate will occasionally knock a man over, and invaliding is expensive work—but away with all these mean thoughts, here comes his promotion, the admiral has made a signal for him, has congratulated him on his promotion (after ten or eleven years' service as a lieutenant, and eight or nine before that) to the rank of commander, and invited him to dinner. He returns to his ship beaming with happiness, to receive the congratulations of his messmates, and in the exuberance of his joy and prospects, stands a whole half dozen of champagne to wet his commission. The midshipmen, who suddenly come to the conclusion that he was not half a bad fellow after all, pull him to the shore, while the ship's company give him three cheers, the band playing "For he is a jolly good fellow," and our newly fledged Captain (by courtesy) has to find his way home to Rosaline and happiness, as best he can, the liver certainly a little out of order and he not quite so young at thirty-four as he felt at nineteen.

Well, Rosaline and happiness, and eight and sixpence a day, are attained; the house is certainly very small, but large enough for all their simple wants, and is there not the picture of his late ship of which he was first lieutenant over the mantel-piece? not a rope yarn out of order, just as she looked when inspected by the admiral, who by the way, complimented the captain for the work of the lieutenant.

But soon he thinks it time to see about an appointment, and many is the talk on the subject, with tearful eyes on one side, until the application is made, and the answer received that his "letter had been received and laid before their lordships who would take his case into due consideration." It is the answer he expected, so he is not disappointed. After a few months and when he has been blessed with a son and heir, he thinks he had better go to town to push his own claims, and although he can ill afford the journey, still he must go, and he smuggles himself into the corner of a third class carriage, as if he were on his way to commit a burglary rather than to seek employment in a profession that professes to employ him. To make a long story short, he sees the

First Sea Lord, (who has just seen six or eight before him, all with the same tale—want of employment) he is well received, his services acknowledged, character well known as a good officer and seaman, but what can he (the Sea Lord) do? he cannot give employment to all, "but depend upon it I will not forget you when there is a vacancy," and he is bowed out of the room. After two years on half-pay our type is congratulated by his brother officers as a lucky fellow in getting an appointment so soon! He receives it almost with a sigh, and Rosaline laughs and cries at the same time, she does not know which she ought to do most, but both know the meaning of the appointment, it is simply separation for three long years; and there is Rosy in the cradle, who has lately joined her brother, looking up and laughing, as if the heart pangs of her father and mother were the finest fun out; but it is of no use despairing about it, "we must make the best of it and consider ourselves fortunate." So now to consider the ways and means. The savings have vanished and he has mess entrance, uniform, and all the attendant expenses of joining a new ship before him; he must have recourse to debt or an agent, and with an abhorrence of the former he appeals to the latter, who obligingly advances him fifty to a hundred pounds, for which our young commander has to pay five per cent., and two and a half per cent. on his pay, ergo, about twelve per cent. if the larger sum is advanced, and about twenty per cent. if the lesser, and when it is all paid off, he has to pay the two and a half per cent. for—nothing. Well, the epaulettes are bought, his old lieutenant's coats are furbished up with an additional gold stripe, which makes the old ones look shabby, but they will do. All arrangements are made as to Rosaline's support, she promises to be "so careful!" She has been very busy while her husband is away fitting out his ship, making all manner of nic nacs for his cabin, that is, when not engaged at the sterner work of sheets, pillow cases, shirts, etc., and as his clothes are stowed away in his cabin many a tear drop from his dear wife's eyes is stowed along with them.

The time is come, the good bye said, the handkerchief waved, the wife stretched in an agony of tears on the lonely bed, while the happy! fortunate! commander is too busy to give a thought to his dear ones now left behind.

His pay is now £365, barring the income tax, which blessing of the British public follows him everywhere, and takes back part of what it gives. With this he has to support, his rank, his mess, his wife and two children, and repay the agent; all this he does with the most exemplary forbearance and self-

denial, and returns home with a light purse but a merry cheerful heart, for has he not to meet all that he holds dear in the world? Again, he reverts to his "love in a cottage," and £155 a year.

Owing to the flattering report of the admiral on the paying off of his last ship, together with a good word from his last captain, who has interest, he is appointed to commission a ship, and to the envy of many not so fortunate he mounts his uniform and hoists his pendant. His pay of £365 a year is now augmented by command money, £68 a year; but fitting out is expensive work, and pride and zeal are expensive, his pride in his ship would lead him into all manner of extravagances not allowed by the dock yard, he would like to gild the figure-head, and put a little of the same precious metal about the ornamental part of the stern, but the want of that same precious metal in another form in his pocket forbids it.

Rosaline is now *so* proud of her husband, she has a firm belief that there is not another officer in the navy equal to him, and she is a true wife to believe it. But wife and husband, children and father, must again part. Will they ever meet again? Aye, Mr. Holdfast, such questions as these will rise on such occasions, and although with bursting hearts we say, "the three years will soon pass" we know to the contrary, and we know not what may happen before that. But, heave round, boys, stamp and go, strike up, fiddler,—the anchor's apeak,—brace round the head yards, and again we are on "the sea, the sea, the open sea, so wide, so free, etc.," but it is of no use, the words stick in our throat like a lump, and nothing but duty and time, blessed time, will remove it.

The commander has now to keep his own table, has had to lay in his own stock of wine, port, sherry, and marsala, perhaps a case or two of claret and the same of champagne, for very high days; he must occasionally entertain two or three of his officers, or he would be considered a shabby fellow, and it would not do to be thought that, even though Rosy may have to go without a winter frock and Jack go about in shabby knickerbockers.

Six months from England and he hears of another addition to his family, he pulls rather a long face, as well he might, but when the letter assures him that both his wife and the little "Newcome" are doing well, and he reads a small piece of crumpled paper scrawled rather than written, with a pencil from herself, telling him, oh such sweet words! and that she was thinking of him all the time, he stealthily kisses the precious document. It would not do, oh no, for the captain to be seen guilty of such weakness, so he crushes the paper into his pocket, and seizing his cap, rushes on deck and looks

long and earnestly through his spy glass at—nothing—and hums

"In Providence I trust,
For what must be must"—

and then "giving his sighs to the wind" resumes his wonted dignity. Some months after he receives another letter in the well-known hand but somewhat shaky. His heart misgives him when he sees the black border, and below in his inner cabin where no eye can see him, he learns that his dear bright-eyed child Rosy had gone to the haven of rest, and that six weeks ago she was laid in her narrow home. Oh how sudden! quite well, and merry as the lark, by the last letter—dead and buried by this!—can it be possible? that little thing that twined herself so closely round his heart, that to separate them seemed like tearing away the old ivy from the older wall, the one would scarcely go without the other,—and I away! It must be a dream! but oh no! there lies the too true telltale letter —but

"Draw the curtain close
And let us all to meditation."

What are you doing aft there? Don't make a noise. The ship knows well there is something the matter, never was such a stillness, the men take off their shoes as they pass over the Captain's head—the very orders are given in a subdued tone and are silently obeyed —no sound of laughter rises from the wardroom—the very mirth of the gunroom is quenched, for has not the Captain we all respect received bad news?

Yes, Mr. Holdfast, that is another of the things he is paid for, but how much do you value it at? What is its market value in the City? they say everything can be ticketed there—what's the figure? don't blow your nose and wipe the dust out of your eyes, but speak up like a man if you have any voice left.

Orders for home! hurrah! The capstan flies round and the fiddle is "nowhere" in regard to time,

"Hoist, hoist, every sail to the wind,
The course of my vessel improve,
I've done with the toils of the sea,
And, sailors, I'm bound for my love."

Oh that provoking order "to proceed home under sail." No coals to be consumed without being hauled over the coals for doing so; those dreadful calms, the hopes, the fears, the amount of breath expended in whistling for wind, all these trifles are magnified; but at last the welcome order is given to "let go the anchor," and once more our hero is on shore.

We will get hurriedly through three years in the coastguard as

Inspecting Commander, which appointment he is fortunate in getting, and when he may be said to live in clover.

He at last is promoted to a Captain, and he retires from active duties to half-pay of £191 a year, or just sixpence a day more than he had become entitled to as a commander.

Jack has now to be sent to school, we will say he is sent to the Royal Naval School at New Cross as it is not only the cheapest, but the boy has a chance of winning a cadetship. Forty pounds a year, or we should say per nine months, with clothes, travelling, etc., comes very heavy, but as Rosaline says, "we must make some sacrifices for the dear boy," so wine becomes a myth in the household, the evening glass of gin and water becomes more watery, the small beer becomes smaller, and the occasional cigar is changed for a pipe, the other children's clothes are turned again on the principle that one good turn deserves another, and Rosaline's cheeks are not quite so plump as they were, but all are cheerful and hopeful, for Jack is a steady boy, holds his own at the school, and is going in steadily for a cadetship.

The captain cannot expect a ship yet, he is too young both in rank and age, having received his promotion at forty-three; but he hopes for one, and his friends are on the look-out. One year, two years pass and no appointment; the £300 saved, in spite of the most rigid economy, has shrunk to one-half that figure, and his agent's account sets him thinking, he thinks as he sleeps, and as he shaves, and cannot help thinking—as he prays. Yes, Mr. Holdfast, you need not open your eyes so wide! we repeat it—as he prays; sailors may be devil-may-care fellows, they brave all kinds of danger, but in their heart of hearts they mostly have a God enshrined to whom they pray.

A telegram! "From Jack, to Captain ——, Dear Papa, Have won second cadetship—shall be home to-morrow." Oh what joy! how Rosaline kisses her husband and the children, she is so happy! so is the captain, but he cannot help thinking how much better it would have been if Jack *could* have won the first, which carries with it the Yarborough Scholarship, equal to about £40, it would have helped *so* much to fit him out. Jack however comes home and is received with all the honours of a hero. We will assume that he is successful in passing the ordeal at the College at Portsmouth, and that he is safely shipped on board the *Britannia*, where we will leave him to work his way as his father had done before him. The father returns home to count up the cost, and finds that the cost of travelling to Portsmouth, and to Dartmouth, with numerous

other necessary expenses, make a great hole in what was fondly hoped to be the "nest egg."

Within three years our captain gets a ship; his pay of £400 a year, and command money of £137, making a total of £537. He is a happy man, but what with Jack's fit out and yearly expenses he must, in order to take his ship again, have recourse to his agent, who again advances the sum desired; it will take a long time to pay that off; however the appointment must be accepted and the agent must be paid.

In the course of the commission he again frees himself from the agent's debt, keeps his wife like a lady, sends his children to school, keeps Jack at sea, and on getting his Christmas account from his agent's, after he has paid his ship off finds the sum of £249 16s. 7½d. to his credit. His half-pay is now increased to 12s. 6d. a day or £228 a year. In the course of a couple of years having a good name and being not backward in asking, he gets another appointment for another three years' service. We will now give him the full benefit of his increased pay, amounting in all to £733 a year; this indeed is harvest time. The credit side at the agent's, although reduced to a low ebb on commissioning the ship, now shows the formidable sum of upwards of £500 after all expenses, and he settles down again on his £228 a year, not without hope that he may get another chance and eventually reach his flag. But year after year passes, his hopes lessen, his energy is not what it was, it is close work to make ends meet, even to trespassing at the rate of £50 a year on his capital to meet Jack's wants, Jim's schooling, Jenny's ditto—the extras are a puzzle never fathomed—and baby's (thank Heaven, still the baby) endless wants.

Were we to attempt to give our hero another ship, to bring him to that goal of ambition to which every naval man aspires, namely, his flag, we should be accused of going beyond the mean average of success in the Royal Navy. What say you, Sir Henry, Admiral and K.C.B.? you cannot say the generality of your brother officers have been so fortunate as yourself. Well and honestly acknowledged. And what say you, grey-headed Lieutenant? We beg your pardon, Retired Commander? You wish you had had the luck of our hero. Ah! we dare say you do, but you are in goodly company in your M.N.O.P.W. lists, and a glance at them makes us think we have gone too far, and had we shelved our hero after his first ship as commander it would perhaps have been nearer the mark. We probably should have done so but for the object we have in convincing Mr. Holdfast, that even to the highest rank of those who perished in the *Captain*—without they be men of

private means, to which class this paper does not refer—the means provided by Government are too limited to allow an officer to make adequate provision for his family after his death.

Our captain seeing no prospect of further advancement before him, and finding that in another year he would be retired by reason of non-service, in accordance with the late Order in Council, accepts the retirement which in his case with twenty-seven years sea time, age fifty-five, gives him the handsome competency of £550 a year. That is his cottage, the one with a flag-staff, "Brunette Villa" it is called after his first command, and there is the captain in his shirt sleeves planting his early potatoes, of which he is very proud, and that young woman and boy racing round the garden are Jenny and the baby, Jim is apprenticed to an engineer, the captain could not afford to send him to sea! Jack is a lieutenant and doing well, and that middle-aged lady sitting at work in the summer house, who is not ashamed to wear her own greyish hair, is Rosaline.

You say you have heard of "pillage to soldiers, prize-money to seamen," and does not this prize-money count for anything in the way of remuneration? Well, it is certainly true, that a little prize-money is made now and then, just to keep up the delusion, but we may fairly say that as an investment, the reversion of all the prize-money made would be dear at £5 a head for each officer throughout his whole career.

You say also, Mr. Holdfast, that we have not taken into account the value of provisions. We regret the omission, but it is not of very great importance, the value is about sixteen pounds a year; Government estimates the cost at about six or seven pounds. A sailor Secretary of the Admiralty kindly substituted the latter payment for the value in kind of the former amount, and, acting on the strictly co-operative principle, while paying an officer fourpence a pound for beef, permitted him, if necessity caused him to want some, to purchase it at eightpence from Government stores, and would you believe the ingratitude of these same officers, they "would not see it," some even had the temerity to ask for their pound and their pint instead of their money—confound their impudence for daring to think what was best for them! We tender our thanks to the present Board for abrogating this obnoxious regulation.

Supplied with mess utensils? Yes, sir, they are in all messes, but when we were in a wardroom, we found, on a near calculation, that we paid in the three years between two and three hundred per cent. for the use of those mess utensils. But you thought servants *were* allowed. So they are, but they are not paid enough to keep them honest.

Now we will tell you of one or two things, Mr. Holdfast, without a question. When an officer is travelling to join a ship he has to pay his own expenses, and when not travelling strictly on duty he is not permitted to travel at the reduced rate of twopence per mile.

While seamen have the privilege of sending their letters from the most distant parts of the world to England for the sum of one penny, the officer has to pay the full foreign postage. Until lately they had an advantage but it has been withdrawn.

If space permitted we might enlarge on the exorbitant prices officers have to pay for necessaries abroad, where dollars are shillings and doubloons sovereigns; and also how the credit of Old England has to be upheld in meeting ships of foreign navies, for it would not do to be shabby on such occasions, would it, Mr. Holdfast? Officers of some foreign navies have allowances for the purpose of maintaining the dignity of their respective countries, but British officers have to support British credit out of their own means.

You ask, why our hero could not do something to increase his income during the time he was on half-pay? Bless your innocent heart, Mr. Holdfast, we should like to see him attempt it, you doubtless are under the impression that half-pay is given for a reward of services rendered, no such thing; it is a retainer. Nominally, an officer on half-pay is his own master and can employ his time as he pleases, but practically, he is debarred from engaging in any other pursuit, because he is supposed to be ready for service at a moment's notice. You suggest that he might take command of a merchant ship, but there are two little hindrances to that, the first being, that by doing so he is taking the bread out of the mouth of another man; and the second is, that he must first obtain Admiralty permission, which is not easy to obtain. Moreover, there is another disadvantage attending this sort of thing: we could tell of more than one instance, of an officer accepting (with Admiralty permission) civil employment, and entering into bonds and securities for the due performance of the same, who, on the arrival of an appointment to one of H.M. ships, pleaded the Admiralty permission to excuse himself, but was then told that if he did not take the appointment he must resign his commission.

We will now revert to our third point: why naval officers do not, as a class, make provision for their families.

We need not tell you, Mr. Holdfast, who are a Director on the Everlasting and Indisputable Life Assurance Board, that the value of a life is in proportion to its risk, and the risk depends upon the various circumstances of trade, profession, climate, etc., also

that the greater the risk, the greater the premium. Naval officers being subject to great risks—especially in war time—you would, perhaps, think one of them a shaky investment at 99¾ per cent. With the high premium, therefore, that is required for extra risk, it is not very surprising that a struggling officer finds it difficult to effect an insurance. But there *are*, nevertheless, two or three assurances he does effect; the first he hopes never to require a return from. As soon as he is a lieutenant, he invests (it would be a happy thing if all did it) one day's half-pay in the year, in the Royal Naval Benevolent Society, and he consoles himself that if he, or his, may never require its aid, there are others that will. Make a note of that Society, Mr. Holdfast, and when your heart is warm about this time of the year, and you are sending your cheques to your usual charities, do not forget to address one to the Secretary, Royal Naval Benevolent Society, Adam Street, Adelphi, W.C.

Another day's half-pay goes to the Royal Naval School, New Cross, for he knows that should misfortune overtake him, or he has a large family, his circumstances will be considered, and his sons educated even at a loss to the establishment; and a third day's half-pay to the Royal Naval Female School at Richmond, with the same object for his girls. This is as much as the most prudent officer can afford to do by way of provision for his family, for even the three days' half-pay, as a man goes on, is a consideration to him.

We will now revert to the last point, viz., the provision made by Government for the widows and orphans of naval officers. Putting on one side, as irrelevant to our present purpose, the war time risk of being killed; the pensions are as follows: to the widows of captains of three years' standing and over, £90; if drowned on duty, £150. Of captains under three years and commanders, £80 and £140 respectively in the circumstances alluded to. Of lieutenants of eight years' standing, £70 and £100, and lieutenants junior to that standing, £50 and £65. The compassionate allowance to children being from £20 to £10 a year for each child, according to rank and circumstances of death. The pensions cannot be claimed as a right, and the Admiralty have wisely guarded against those in wealthy circumstances, or re-married, or bad characters, and even those who marry an officer that has passed his sixtieth year, from receiving pensions. The compassionate allowance is granted under similar restrictions, to the boys until they attain the age of eighteen, and the girls the age of twenty-one, and as the life of man is not dependent on his rank or number of his family, we may select one from any class, and allow him any number of children for examples.

Without going into the details of the widows' pensions of each grade, we may generalize, and without departing the least from the truth, may say that a widow's allowance, including that granted for children, ranges between £80 and £200 a year. Now, Mr. Holdfast, you know how far money will go as well as any man, What say you to a widow of an officer and gentleman, keeping herself, educating her children, and putting them out in life on any sum under, or even upon the whole £200 a year. Jot down the items, house rent, butchers' and bakers' bills, etc., etc., and see what you make of it? I see you give it up, by the shake of your head. Now, say if you think the widow of an officer, who has served his country well and long, has risked his life in all climates, and wherever there was danger, was first and foremost in it, is justly treated?

Then again, as you, yourself, must admit, Mr. Holdfast, times are changed, and money won't go so far as it did when you were an apprentice, and your master, on his retirement, thought himself well off with £1000 a year, a cottage ornée, and a one horse chaise. Seventy or eighty years ago, when they were first instituted, these pensions were very good, but though times have changed, and the value of money, or its equivalent, has gone down, the pensions have not gone up.

But let us return to the £20,000, that is so much wanted.

Mr. Holdfast, you have never been separated for more than three days from your wife and family, and you were glad enough to get back to them, and you know you would yield to no man in your love to your wife and children, down to little "Trot," who comes running in with "Pa's slippers" when you return from town, and expects something out of your "suburban" bag in return, and is not generally disappointed. Well, you remember that night after the dinner at the Shoemender's Company, of which you are Master, when the turtle and that "splendid haunch" did not agree with you. And you have not forgotten that dreadful nightmare you had, when lying on your back you dreamt that the house was in motion. Do you recall when you had actually realized the fact, the agony of mind you were in, and as the inclination of the house became greater, and the smash of breaking articles, chimney pots, tiles, etc., sounded in your ears, how all your thoughts reverted to those you loved, and your agony became all the greater from your utter inability to help them, and just as the house was about to come down with a crash you called out and were awakened by a sudden shake from Mrs. H., with "Benjamin, what *is* the matter?" and the hand clutching the clothes and the great beads of perspiration

on your forehead, were all the proof left of the dreadful agony you had gone through! did you ever say "Thank God, it's but a dream" with more fervour? But what if it had been reality?

Turn we to that dreadful September night, and to those in the ill-fated *Captain;* can we picture that fearful two or three minutes that must have elapsed from the heel over and the blow of that irresistible wave, to the last sad sound of the last man's dying cry? Can the imagination grasp such a subject? to those gallant fellows that were on deck doing their duty the horror must have been great but they had it all before them, they doubtless struggled and clung with all the desperation of dying men to the rigging and sides until the great ship sunk and drew them into the vortex caused by it: but of those who after their watch, had snugly retired to their hammocks and beds, with the comforting feeling that they were safe at least for four hours, what must have been their feelings as they were awakened by the sudden and prolonged inclination, when the articles from shelves and all unsecured furniture began to crash to leeward, and the rush of waters and the scalding blinding steam came rushing in from the engine room, adding agony to agony?

Then rose from sea to sky the wild farewell,
Then shrieked the timid and stood still the brave,
Then some leapt overboard, with dreadful yell,
As eager to anticipate the grave.
And the sea yawned round her like a hell,
And down she sucked with her the whirling wave,
Like one who grapples with his enemy,
And strives to strangle him before he die.

And, Sir, what must have been their thoughts in those brief moments? can you doubt it, Sir, but that it was of those who were as dear to them as their own souls? to those who now hold out their hands to you.

Thanks, Mr. Holdfast, that little book folded in two in that capacious pocket book of yours; yes, we have seen it before—here's pen and ink—we won't look—don't be afraid of another 0 to that figure passing through your mind, it will not spoil the digestion of that beautiful saddle of mutton that has been hanging for this New Year's dinner, believe me as a mental physician it is a capital restorative, it will cause your very face to shine and do the same for all your family—by reflection—thanks.

Advertisement for our next number.

"The Committee of 'The *Captain* Fund' have great pleasure in announcing that no further contributions are needed for the above fund, a generous and anonymous contribution signed 'B. H.,' has greatly contributed to this result."

MERCHANT SHIPPING LEGISLATION.—RULE OF THE ROAD FOR STEAMERS.

During the past Session the draft of a huge Bill, for the consolidation of the Merchant Shipping Laws, was submitted to the Legislature for consideration, but it was pushed aside by more urgent measures at the end of the Session, and met the fate of other "innocents," and was slaughtered. The Bill was one of the largest ever introduced into Parliament. The labour of head and hand spent to get it into a presentable shape was immense, and the energy which endeavoured to move it on, under adverse circumstances, was characteristic of its introducer. During the Session it received attention from, and was the object of the solicitous care of, a Committee of Members of Parliament interested in Shipping, who met twice a week at the Board of Trade. What conclusions this Committee arrived at, how far they approved or disapproved of it and what amendments they suggested, are known only to those immediately concerned, but we may be certain that the labours of such a practical Committee must have been of great value, and that the fact of such a Committee meeting and cogitating, and advising on the bill, was in itself a guarantee that the measure had been well considered.

It may or may not be a matter of regret, that the bill, on which so much careful thought was expended, failed to pass last Session. Probably the balance of advantages is on the side of delay; but whether this is so or not, no one can doubt for a moment, that neither the energies of the promoters of the bill, nor the time and talent of the Committee (now popularly known in shipping circles as the Committee of Incubation) have been wasted. The bill is simply delayed and not abandoned. If this assumption that the bill is not abandoned be correct, we may reasonably expect to witness early in 1871 another attempt, let us hope this time a successful one, to codify our Merchant Shipping Laws.

In anticipation of this codification, and during the process, we propose to lay before our readers an occasional article on such special, technical points as may appear to demand their attention, and we cannot do better than open the subject with a consideration of the so-called "Rule of the Road" for steam ships.

On taking it up for consideration, the first step is to explain distinctly in general terms, and in ordinary language, the principles

and substance of the present regulations of which the so-called "rule" is composed. A reference to the regulations themselves will assist the reader in getting through these remarks.*

The first point is that the regulations only apply when there is risk of collision. If, therefore, when one ship A, sees another ship B, the courses of A and B, if continued, are not such "as to involve risk of collision," neither A nor B is required by the regulations to do anything, for so long as there is no risk of collision whilst A and B continue their courses, there can be no necessity for either ship to alter her course in order to avoid collision. This then is the first principle—the regulations, Articles 14 and 13 only apply to two steam ships, each of which is crossing the course of the other, or each of which is meeting the other end on or nearly end on, so as to involve risk of collision. This principle must be impressed on the mind at the onset. It is better that these remarks should suffer from repetitions of this principle, than that the principle itself should not be remembered.

The second point is that, the use of the port helm is only expressly required when both of two ships meeting end on or nearly end on, are to port. One alone of two meeting ships is never expressly required by the regulations to port her helm. If C sees right ahead at D, the red and white lights of another steam ship without the green light, or the green and white lights without the red light, C is not required by the regulations to port her helm, because, in the first place, the two ships are not meeting end on or nearly end on so as to involve risk of collision, and because, in the second place, D would not also be required to port on seeing C. Therefore, as there is no risk of collision between C and D, and as C and D are not both required by the regulations to port, neither is required to port. This then is the second principle—the use of the port helm is only expressly required when each of two ships is ahead, or nearly ahead of the other; that is to say, when each is in such a position as to see, if at night, the three lights of the other. This can only be when each has the other end on, or nearly end on.

The third point is, that one only of two ships crossing so as to involve risk of collision is required to give way. The one that has the other on her own starboard side is to keep out of the way, and as E, one of two crossing ships, must always have one bow or side

* By the Act 25 & 26 Vict., c. 63, sec. 66, the Board of Trade is directed to supply a printed copy of these regulations to any master or owner of a ship who may apply for it.—ED.

only exposed to the other crossing ship (the other crossing ship F, having also one bow or side only exposed to the crossing ship E), E will immediately know whether she is to keep out of the way of F or not, and she, E, will know this by the side on which she sees F. If she sees F on her own (E's own) port side, she, E, holds on; but if she sees F on her own (E's own) starboard side, *and if there is risk of collision*, she, E, has to get out of the way of F. Here then is the third principle—that one of two crossing ships is to keep out of the way of the other, and the one to keep out of the way is named. The one that is to keep out of the way, may do it just how she likes. She may stop if necessary, or she may slacken speed if necessary, and she may either port, go ahead, go astern, starboard, in fact, adopt any course she likes, so long as she does one thing required, viz., "keep out of the way of THE OTHER."

The next point is, that a fast ship overtaking a slow one, is not to run her down. The overtaker is "to keep out of the way" of the overtaken. The obligation here is also thrown on one ship, not on both.

And the last points are, that steam ships are to get out of the way of sailing ships: that steam ships are always to ease, stop, and go astern, if necessary, to avoid collision: and that, in fogs, steam ships are to go at a moderate speed.

The substance of the present regulations may be summed up in the few following lines.

1. Unless there is risk of collision don't alter your course.

2. If there is risk of collision, slacken speed, and stop, and reverse, if necessary.

3. "If you see three lights ahead, port your helm and shew your *red*."

4. In crossing ships, the steamer to the left is to keep out of the way of the one on her own right.

5. In overtaking another ship, keep out of her way.

6. If there is fog, go at a moderate speed.

The principle of the "Rule of the Road" for steam ships, consists, as will be seen from the above summary of a set of simple, logical, and clear regulations; and yet, there is probably no rule that, at one time or other, has been the subject of more misunderstandings.

Probably, one of the greatest sources of misapprehension of the present regulations was, and perhaps may even now be, that they followed and superseded other and different rules. The present regulations came into force in 1863, and have not since been

altered, but before that time there were two distinct and different rules, one was the old Maritime Law, and the other, the so-called "Rule of port helm" contained in the Merchant Shipping Act, 1854. Under the Rule of port helm, British shipmasters had come to believe that they were safe from legal consequences if they "ported" on all occasions, and bearing this in mind, they were, no doubt, sorely puzzled at first to comprehend the present altered state of the Law; and they have often erroneously attempted to justify the porting of the helm since the new regulations became law by a reference to some legal decision given under the old rule of "Port helm."

To most people, the meaning and application of the rule is however now clear; and to most, if not positively all, seafaring men to whom it is clear it is satisfactory. There are, of course, some who do not understand it, and there are some who want it altered, and there are even some who do not admit that it is Law at all. It would be curious to ascertain how far the failure to understand the rule, and the wish for alteration, might be connected with each other. The object of the present paper is not to elucidate that point, but to consider how far certain important suggested amendments can, with advantage, be incorporated in, or substituted for the existing "Rule." Whether opposition and misconception go hand in hand or not, one fact is quite clear, viz., that the more the rules are understood, the less is the opposition to them.

The writer of this article does not say, nor does he think that the wording and arrangement of the present steering and sailing rules could not be improved, all he wishes to urge is, that those rules are the best that have been made as yet, and that whilst many of the suggestions hitherto made are fundamentally wrong, none of them are improvements, or if they are improvements, the improvement is insignificant and infinitesimal, and would be as nothing compared with the uncertainties and other evils that would follow a re-opening of the subject. This consideration at once relieves us from the labour of reviewing the mass of suggestions made from time to time.

But as regards the proposed amendments that will now be considered, it must not be understood that they are of the ordinary harmless or unimportant character of most suggestions. They are proposals for fundamental changes, which, whilst striking at the essence and root of the rules, would introduce elements of danger. They would moreover impose an amount of useless manœuvring, that, without effecting any good, would, if it did not end in positive harm, be the means of harassing and confusing every one on board.

The amendments we will consider, have repeatedly appeared in the public press, viz.,

> "A steam ship having another
> End on, shall port;
> On her port side, shall port;
> On her starboard side shall starboard and stop."

The first principle explained at the commencement of this paper is, that the existing regulations only apply where there is risk of collision when two ships continue their respective courses: so long as there is no risk of collision, so long as the courses that any two ships may be pursuing will not bring them together, let them go on. They will pass clear—let them go. The principle of the proposed amendments is, on the contrary, that the helm of one ship (A) is to be put to port or to starboard, as the case may be, as soon as she (A) sees B, and this porting or starboarding is to be done whether there is any danger of collision or not; or in other words whether there is any necessity or not. The putting of the helm of A to port or starboard, as the case may be, is not to be dependent on anything but the bearing of B as seen from A.

It will be well to consider carefully what these proposed rules mean, and how they will operate, and how far they are an improvement on the present rules, and for this purpose they must be taken line by line.

"A steam ship, having another end on, shall port." A going north, sees B, let us say two miles right ahead of her, steering west. A then is a steamer having another one B end on—A is to port—let us now endeavour to ascertain why. If B were stationary, or if B were meeting A, there would be some reason for A to alter her course, as otherwise she might run straight into B, but as B is moving to the westward at the same rate as A is moving to the northward, she B will be two miles to the westward by the time that A is two miles ahead, why should A go still further to the east of B. Why should A port in such a case? Surely not to avoid collision, for there is no danger of collision if she does not port. There are no reasons to be urged on the grounds of safety why A should depart from her course in such a case, why then should she be compelled by law to make a deviation. But suppose that B, instead of steering a westerly course, is steering south-south-east. Let us still put B two miles off right ahead of A. A is steering north, B steering south-south-east. By the proposed rule A is to port, A must therefore run across the path of B—why should A port in such a case? Surely not to avoid risk of collision, for there is no risk. If A and B both keep on they will pass half a mile clear of each other, and by porting A runs

directly towards the track of B. Here, at once, is an element of danger introduced.

The framers of the proposed amendment of course will say, "Oh, but you have forgotten that if B is going to the westward she would have A on her port side, and B would be required to port while A ported; and if B is going to the south-south-east she would have A on her own starboard side, and would by the proposed rule be bound to starboard and stop while A ported." This, however, appears to make the matter no better, even if it does not make it worse. This will be seen at once, A having B ahead is to port, B going westward and having A on her port side is also to port, and as there is no limit to the porting, B might commence making a circle in front of A instead of getting out of her way. But suppose A going north, and having B right ahead ports; and B ahead going to the south-south-east, starboards and stops as required by the proposed rule; and suppose that the ships are much nearer together than two miles, the matter is infinitely worse.

Whilst the two vessels kept their courses there was no risk of collision, but as soon as A alters her course she gets into a position which necessitates a stoppage on B's part to allow A to pass to the east or south of B, instead of going on in a northerly direction without danger and without stoppage and passing to the west of B. What is the necessity for all this confusion? It will certainly not prevent collision.

"A steamer having another on her port side shall port" is the next proposed rule. A is going north, B is going south—A sees B half a mile off, two points on her own port bow—B also sees A half a mile off two points on her port bow red to red. If they keep on they will pass a long way clear, A will pass well to the eastward of B, B will be to the westward of A, why then should A be compelled to put her head further east, and B to put her head further west and deviate from their courses? But suppose that A going north sees the green light of B one point on her own port bow, and not the red light of B, suppose A going north as before and B going south-south-east, they will be crossing ships. There are only two ways probable by which they could be got into collision. One way to get into collision under certain conditions of speed and distance is for both to go straight on, the other way to make sure of it in certain conditions is for A to port while B starboards, and this latter manœuvre the proposed amendment would expressly require—A is to port, B is to starboard and stop. There is no doubt that under certain conditions of distance, direction, and speed, two crossing steamers may avoid collision, the one by porting and the

other by starboarding: but there is equally no doubt that in other cases and under other and different conditions of distance, direction and speed, not only crossing steamers, but passing steamers whose courses would if continued take them clear of each other, will inevitably get into collision if one ports and the other starboards.

"A steamer having another on her starboard side shall starboard and stop" is the next rule. If they are crossing ships the starboarding is, as shewn above, a source of danger. If they are passing ships, "green to green," it is difficult to understand the good expected to result from starboarding and stopping. There ought also to be some rule to say when they may go on again.

The suggested amendments we have been criticising, are urged on public attention by their promoters in good faith, and in a steadfast belief that they are an improvement on the present rules, and will prevent collisions. The promoters of these amendments, probably think that it is better to impose an unnecessary manœuvre than to run the risk of collision by not manœuvring in time; that it is necessary to require a ship to alter her course fifty or five hundred times unnecessarily, so that she may be sure to alter it once when alteration is necessary.

But surely this must be the misapplication of a principle. It may be well, perhaps, for a man who is a drunkard to abstain from beer or spirits fifty times or five hundred times, lest he should go to excess if he once drink it: but that is a very different thing from requiring him every time he sets his eyes on intoxicating liquors, to drink half a pint or half a gallon of water on the assumption that if he is taught to drink water every time he *sees* intoxicating liquors, he will drink nothing stronger than water whenever he has a chance of drinking anything at all. Surely, it is better to require ships to keep out of the way when there is risk of collision, than to require them to deviate from their courses when there is *no* risk. The proposed rules, the proposers say are brief and not ambiguous, the existing rules, they say, are long and are ambiguous, and have besides a long addition in the way of explanations. The proposed rules, the promoters say, would want no explanation, no supplementary orders, they would be complete in themselves, would be intelligible to the meanest capacity, could and would be acted on; but above all and beyond everything, they would be brief. It may be interesting to look at this question of brevity. Do the framers of the regulations really intend ships to do the following things, when there is no risk of collision?

(1.) A, steering a northerly course in the open sea, B steering also a northerly course a quarter of a mile to the east of A. These two

ships would be running on parallel courses, each abeam of the other. Is A to starboard and stop, and is B to port and go on, and why?

(2.) A, going north, sees B coming south. B is a quarter of a mile off on A's port bow. A is a quarter of a mile off on B's port bow, are they both to port, and why?

(3.) A, going north sees, say two miles off, B right ahead going east, is A to port, and why? and is B to starboard and stop, and why?

If the proposed regulations do not intend to require the movements of the helm as above indicated, then explanatory notes must be added to say so, and the above three cases are only three out of a great number in which the proposed rule need not be obeyed.

But in those cases where the porting of one ship, and the simultaneous starboarding of the helm of the other, would inevitably lead to collision, regulations for special exemptions would be necessary, and would have to be appended to the rules. This being so, where is the brevity?

If the proposed rules were workable as they stand, they would, indeed, be good on account of their brevity; but as they are not workable as they stand, and as the additions necessary to make them workable would be so many, their merit of brevity disappears. In fact, they would have to come back to the present rules in substance, and would, like them, have to be made to apply only to cases involving risk of collision.

We may now dismiss these proposals for amending the rule for the present, with the honest and true conviction that they are altogether founded on wrong principles, for they would make one hard and fast set of rules to be applied in all cases without reference to necessity or to risk of collision, and without reference to the distance, direction, and speed of the two ships. In the case of crossing ships, they would often require both ships to do something unnecessary and even dangerous, instead of leaving the responsibility where it rests under the present rule, on one of the ships (and that one indicated) to get out of the way of the other.

The next class of suggestions so often made public is one that relates more immediately to the lamp fitting and signalling part than to the steering and sailing rules. These suggestions are various and the means proposed are often different, though the end intended to be obtained is the same, viz., the indicating to an approaching ship B, the direction of the head of the ship A seeing her. Many ways have been suggested for doing this, sometimes by arranging the lights in a special manner, sometimes by increasing the number of lights, sometimes by fireworks, red, green, and white, as the case

may be, and sometimes by a mechanical contrivance in connection with the tiller, whereby an extra red or green light is uncovered, or a red or green shade is passed before the white mast-head light, when the helm is ported or starboarded.

The only proposals of this sort worthy of consideration are—that the side lights should be placed with reference to the mast-head light, so that when seen from ahead the three lights should be in the angles of an equilateral triangle, and when seen from about four points on either bow, the coloured light should be under and in a line with the mast-head light. This is a really good suggestion, theoretically there is nothing to be said against it and everything to be said in its favour, the only thing standing in its way is that as the shipowner places his masts and arranges his sails, etc., how he pleases, the suggestion although sound in principle cannot be adopted for want of uniformity of arrangement in the rigging of ships.

To the suggestion that warning lights should be burnt or shewn to indicate, according to colour the intention to starboard to port, or to go straight on, there appear to be these objections, viz., that the present regulations prohibit the use of all lights but the green and red side lights and white mast-head light; that to be of any value the use of extra lights must be rendered compulsory, for if the use of them be optional they will not be used. That the rendering of the use of anything of the sort compulsory is open to the objection, that a failure to use it must be treated as a failure to comply with the regulations, and must be punished accordingly. That the advantages are doubtful, at all events not proved, and the disadvantage and expense are serious. That fireworks might get lost, or damaged, or mislaid; and if a mechanical apparatus in connection with the wheel is used it might get out of order, and in such a case the ship would be in imminent danger. That the preventing of collisions does not depend on the shewing of extra lights or the burning of fireworks, but on the keeping of a good look-out, on observing the lights now carried, in acting with judgment, and knowing and observing the regulations as to stopping the engines, and acting on the Rule of the Road. That all contrivances of the sort tend to the trusting to uncertain indications of what another ship is likely to do; or to departures from rules; instead of to the relying on an observance of the rules, on judgment and prudence, and on the ordinary precautions of seamen. That no collision is recorded as having happened through observing the rules. And if the lights were to depend on the action of the tiller there is this additional objection, that the placing of a

coloured glass before the mast-head light would destroy its use as a mast-head light: that as the rudder of a ship is but seldom stationary in a line with her keel even when she is making a straight course, and as the colour of the mast-head light will change with every movement of the helm, the light might shew red or green without any intention of the officer of the ship to deviate from his course.

On the whole, but one conclusion can be arrived at, viz., that there are no grounds whatever for adopting any of the suggestions above adverted to for amending the Steering and Sailing Rules for Steam Ships. Any attempt to discuss such a subject as this in the House of Commons must end in failure. The only course open is for the country to have confidence in the opinions of her authothorized advisers, for the Government to oppose to the utmost any attempt at introducing into the rules alterations of the vicious nature referred to in this short paper. Suggestions for alteration can be generally met by reminding the proposers, that the present rule goes forth with the sanction of every competent authority in the world, that it has often been discussed, and as often confirmed; and that there is no legal decision that a collision ever happened by acting on the rules.

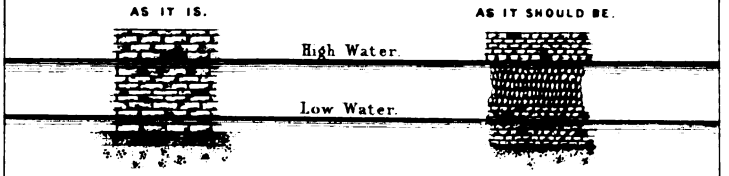
Before dismissing the subject entirely, there are just one or two points that deserve a passing notice. One is the extended application of the excellent regulations as to lights to all ships in inland waters. It may often be observed, that some ships in the mouths of rivers, and in rivers and harbours do not carry lights. When this is the case, the reason may be that not being sea going ships, the regulations do not apply to them, but it is a question for consideration, whether the regulations as to lights should not be made to apply. This can be done without in any way disturbing the present international arrangement.

At the present moment the regulations for preventing collision apply to all sea going ships even when navigating a river, unless there is any special rule applicable to the particular river. There can be but little doubt that in the Thames, steamers going up ought to keep on one side, and steamers going down ought to keep on the other side of the mid channel; and it is only a few days ago that two steam ships came into collision, which may possibly have arisen through uncertainty in the mind of one or both captains whether the general rule, or whether any special rule applied.

Another point is the suggestion that a white light should be shewn over the stern of a ship when she is being overtaken by another ship. Such a regulation being an addition to the rule cannot of course be made compulsory in the international regula-

ALDERNEY BREAKWATER.

FRONT VIEW.



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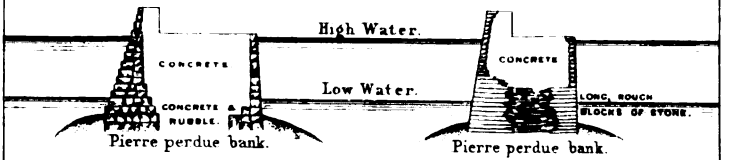
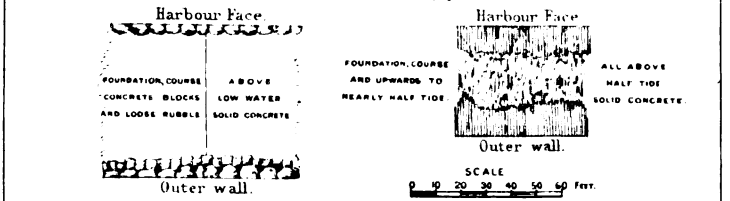
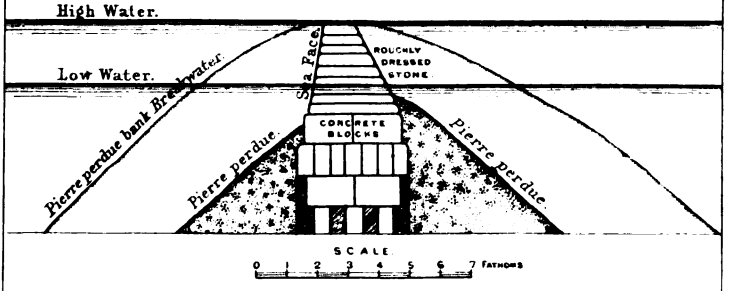


GROUND PLAN.



PROPOSED PLAN FOR BREAKWATERS.

CROSS SECTION.



In this Plan it is proposed to exclude hearting and to concentrate the whole strength of the retaining walls in one Central mass.

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tions, until it is discussed and agreed to by the parties to the regulations. In favour of it, it may be urged that a white light shewn at the stern, will often indicate to a steamer crossing the channel in a dark night the presence of a sailing vessel ahead of her whose lights are shut off by the screens. It may also be urged that the sailing ship ought to do something to contribute to her own safety. Against it however, must be borne in mind the fact that at present the obligation to get out of the way is thrown on the steamer and on her alone; and this being so the steamer looks out, whilst the throwing of the responsibility on the sailing ship of showing a white light, would divide the responsibility with, and therefore lessen the responsibility of the steamer, and if by chance a steamer should, whilst neglecting to keep a good look-out, happen to run down a sailing vessel by overtaking her, the steamer would, if the light were not seen, plead that the sailing vessel did not show it and was therefore in fault. This suggestion however is a legitimate one for discussion and arrangement, and will no doubt be settled satisfactorily.

REMARKS ON THE CONSTRUCTION OF BREAKWATERS.

By Staff-Commander J. Richards, R.N.,
Admiralty Surveyor.

From the evidence of scientific men as well as of observant practical seamen who have studied the subject, it appears that a nearly vertical wall makes a better sea-face for a breakwater than a long slope; but, as at present (if one may judge from the thirty-eight competitive designs lately submitted for improving the Jersey Harbour accommodation), civil engineers do not appear to recognize any fixed rules for such works, a few remarks from a practical observer may be useful in directing public attention to certain points worthy of investigation.

It has been observed generally that the undulatory movement of the ocean swell in its progress towards a sloping shore, exerts but little percussive force until it begins to *feel* the bottom, after which its character is speedily changed to a dangerous breaker, containing force within itself sufficient to lift and whirl about stones of large size.* Also, that during calm weather with a rolling swell

* On Plymouth Breakwater, stones of from six to eight tons weight are chained down to prevent their being washed away by the sea.—Ed.

breaking heavily on an open beach and forbidding all approach, it is a common occurrence for boats to land easily on outlying rocks, whose sides rise nearly vertically from deep water. It seems to be conclusive, therefore, that the natural onward movement of the water at the lower part of the swell is retarded by contact with the bottom, and that the *drag* below, consequent thereon, causes a tumbling over, or rotary motion of the apex and fore part of the swell, in which is abruptly expended its dynamic force, as seen in the breaker.

In a somewhat similar manner the breaking wave is caused in deep water during a strong breeze, only the process is to a certain extent reversed. Instead of contact with the ground retarding and disrupting the lower part, its *surface* is disrupted and driven by violence of the wind faster than the part below, and the rotary motion culminating in the breaker is the consequence.

Reasoning on this theory and the before-mentioned facts, it seems probable that a breakwater built up *vertically* from deep water would have much less strain to bear than a *sloping* structure.

The Admiralty Pier at Dover is an example of the vertical breakwater wall, and it has stood well throughout the most violent gales: the Alderney Breakwater (although built in a more exposed position than Dover, and, therefore, not a fair comparison) being built on a *pierre perdue* foundation, will serve to illustrate the slope principle; and *it* gives way apparently as a matter of course whenever it has to encounter an unusually severe gale. The sloping sea-face of the *pierre perdue* bank on which this very massive work is built, appears to trip the waves on their approach, just so as to cause them to exert all their force against the vertical wall, and the effect is tremendous:* stones of many tons weight are thrown about like boys' marbles, and although the breakwater pier is all solid stone and concrete, breaches are made in the course of a few hours large enough to sail a vessel through at low water.

It may be asked, Would the Dover pier withstand the heavy seas to which that at Alderney is subject?

There is some reason to believe that it would, for the Dover pier has no *pierre perdue* bank to intensify the sea, and the Alderney breakwater always gives way near its foundation, at the apex of this bank, which is not more than five or six feet below low-water mark. It is not however intended to assert that the system of construction adopted in the Dover pier is the strongest possible, for it

* It is said that in one gale of wind, upwards of two thousand tons of stone were thrown from the outer to the inner side of Plymouth Breakwater.—ED.

is not; nor is it desired to condemn the use of *pierre perdue* banks altogether, for building up breakwaters vertically from great depths (as at Alderney, which is in twenty-three fathoms at low water) would be too expensive; but it is necessary to ascertain and fix safe levels for the foundation of the vertical walls, so that they may be below the reach of any violent action of the sea.

The height of the waves the work will have to resist must be known to determine this point; for this as a rough estimate we may assume that to resist a wave thirty feet high the foundation of the breakwater wall should be laid about that depth below low-water mark.

With regard to the best *lines* or plan for constructing breakwaters, they must of course vary to suit different localities, but there are certain general rules applicable to all such structures: as for instance, *concave* lines seaward are most objectionable, as causing the sea to concentrate and increase its powers of destruction, whilst *convex* lines deflect and lessen its force; but the latter might nevertheless be objectionable if the sea were thereby thrown into a ship channel; therefore, as a rule *straight* lines are best, and they are of course the least expensive.

The general *system of construction* adopted in most breakwaters appears objectionable, differing but little (as they generally do), except in magnitude, from ordinary landing quays. In very exposed places, as at Alderney, enormous blocks of hard stone are used for the outer wall, backed by large rectangular blocks of concrete about low-water mark; all above which is formed of a nearly solid mass of that material. The stones forming the outer wall are laid in regular horizontal courses, on their broadest sides, and lengthways alternately with *headers;* much in the same way as a common wall on shore is built, excepting that each course is laid within the one beneath it, or has a *batter* of several inches. The sea-face profile of such a wall presents somewhat the appearance of a very steep flight of steps. The plan is bad, for the ledges catch the falling sea, and, assisted by pressure of the wave from without, cause it to act with greater energy in penetrating the work; moreover, the whole system of construction here described is weak, as will be shown hereafter.

In order to arrive at some conclusions as to the best style of breakwater construction, let us examine the action of the sea on the rocks of an exposed sea-coast. Where the strata are *horizontal* it will be occasionally seen that a soft underlying vein exposed to the action of the waves wears away quickly and involves the destruction of the entire superincumbent mass, and that where *vertically* strati-

fied rocks exist the destruction of a soft vein frequently takes place without the hard strata on either side being much affected by it. In the first case, the coast wears away quickly, in the latter it remains without perceptible change for ages. In applying these illustrative cases to Alderney breakwater the horizontally stratified rocks may be represented by the long horizontal courses of stone facing, and the soft vein by its foundation at the apex of the bank of *pierre perdue;* the practical effects being as above stated.

Another cause of weakness in this breakwater is the peculiar shape of the large stones of which the outer wall is built. They expose such a large portion of surface to the action of the sea in proportion to their size and weight that they are very liable to be shaken loose in their beds; after which their great magnitude only enables them the better to act the part of battering-rams in quickly destroying the smaller and softer material by which they are backed.

From the foregoing arguments and reasons proceeding therefrom, as well as others based on observation and actual facts, it would appear to be generally advisable to build nearly vertical walls up from the bottom to breakwaters where the depth does not exceed five fathoms; that the sea-face of such structures should be inclined inward for security, about one foot to six in height, but *batter* should not be formed in horizontal ledges as at Alderney.

That the weakest part of breakwaters being near low water of spring tides, this part requires first-rate material and peculiar care in construction: concrete is, therefore, out of place here; stone only should be used, and in the following manner:—The blocks of stone (the heavier their quality the better) should be quarried in great length in proportion to their size, and should be placed in the work *end on* to the sea, by which plan only a small portion of each stone (in comparison with its size and weight) will be subjected to the *direct* strokes of the sea, and the long tails of the stones being firmly gripped by others lodged in the body of the breakwater, cannot vibrate or become loose.

Stones for breakwaters need not be of extraordinary large size (although the larger the better); but for all the most exposed parts of the work (that is the sea-face near low-water level) it is imperative that they should be somewhat near certain proportions, which I should roughly estimate as in length about three or four times their breadth, and half their breadth in thickness. For the inner part of the work the same proportions should be adhered to, and although the stones need not be so large, the entire work from the bottom up to nearly half-tide level should be regularly built *dry* according to the same plan as the outer wall. The stones for the outer wall

should be dressed on their beds and joints, but need not be laid in regular courses. From about a fathom below low water and upward as far as the dry work extends it would be desirable that the stones of the outer wall should lie as close together as possible, but until some method has been discovered for securing *absolute* solidity in the body of the work it would seem to be safer to leave the interstices between the stones within open, so as to allow a lateral escape for the air and water compressed in through the outer wall by violent action of the sea.

From below half tide (as far as the concrete formation can be depended on) and upward, stones of a less size bedded in concrete may be used, so that the upper part of the breakwater may form one monolithic mass.

From these remarks it may be seen that no confidence is placed in the system of *hearting* breakwaters with rubble stone, and it must be apparent that in such cases any serious damage to the outer retaining wall might enable the sea to draw out the hearting and involve the destruction of the entire work; but by my plan of construction there is but very slight chance of any of the outer stones being moved by the sea, and even a partial *settlement* of the foundation would not be likely to involve any very serious consequences.

Parapets on breakwaters, as at Alderney, should be avoided where they are not absolutely necessary, as they prevent the escape of the sea over the work: causing it to rise and increase in altitude and volume, and to act with greater energy against the outside wall.

The above economical plan for constructing breakwaters is proposed from an experimental knowledge of the fact that coral reefs afford *perfect* shelter from the ocean swell, although they are generally covered to the depth of several feet at high water.

The accompanying sketch is intended to illustrate the different systems of construction.

LIGHTS!

"LIGHTS! lights! lights!" cried the courtiers, when during that conscience-probing play of Hamlet's, darkness gathered over the mind of the guilty king. The flambeaux were brought; but of the light which he wanted not all the tapers in the world could afford a single gleam. "Light! more light!" is the prayer of the earnest inquirer after truth as he gropes amidst the shadows of sublime and

transcendent things. "Shew a light here!" may perhaps be the exclamation of his Satanic Highness to those of his unscrupulous followers who are said, according to a popular figure, to hold a candle to him. "Buy a box of lights!" bawl out with worrying importunity the myriad little vagabonds in the street, who seem to think it the bounden duty of every one with a penny to invest it in matches whether needed or not; to be let off as fireworks if not wanted for cigars. Physical or metaphysical, material or spiritual, literal or metaphorical, the word light, either in singular or plural form, meets the eye and the ear continually; and certainly if gas and oil, Drummond and Bude apparatus, sun-burners, lime lights, magnesium and electric sparks between points of carbon, could in their united effect give much general splendour to a world, this little earth of ours might appear as a very sparkling little star to some distant observer in the skies; and as we give Mars his name because of his blood-toned hue, and Venus because of her beauty, and Jupiter by reason of magnitude and majesty, so perhaps may some outside observer in celestial space call our planet the Blazer, the Sparkler, the Cresset-star, or the Heavenly candle, or some other name suggested by our artificialities, as much as by our nature; by the light which we seem to make as well as by that which we derive. Only think of it, ye small but well-meaning people in trade, who are apt sometimes to fancy that your little doings affect tremendously the general economy of the universe, what a happy glow of self-importance must result from the notion that possibly your splendid shops, with plate-glass windows shining like crystals in all the glory of innumerable gas-jets, may be adding to the apparent brilliancy of this planet, as seen by the celestials a million of miles away.

An American humourist speaks of Angels emigrating from Heaven to Earth, attracted by the felicities of residence in the United States. If European cities cannot vie with those of the mighty Republic, yet almost all of them have a certain degree of brilliancy, a sensuous charm of their own. They have cafés, Alhambras, theatres, restaurants, music halls, jewellers' and drapers' shops, and perhaps some of the inferior order of "heavenly emigrants" hardly yet qualified for the full privilege of American citizenship, might be attracted by such places as London, Paris, Vienna, or Berlin. If they would only bring with them money to spend, would not they be welcome among the shops in Regent Street, Piccadilly, and St. Paul's Church Yard? Fancy a celestial visitor of the gentler sex sitting at a counter, receiving the soft sawder of a gentleman with a white tie, and being tenderly per-

suaded to buy a velvet mantle for £3 5s., or a charming bonnet for 18s., or a wonderful chignon for 12s. 6d., all marked as bargains in the window in plain figures, and for ready money. But we have no evidence as to the tastes of angelic beings nor any proof that there are angels at all in our scenes of luxury and splendour. Pretty girls, indeed, have been called angels by lovers inwardly lubricated with honey or melted butter, but it is clearly an illusion or case of mistaken identity. No one has ever seen beings of the skies come down on earth to do their shopping or seek their amusements, notwithstanding the brilliancy of the windows and the show rooms, and the flattering promise of the advertisements; and as nobody has ever heard that they have shops of their own among the stars, it is to be inferred that they live under conditions which happily make them indifferent to mantles or shawls, bonnets, jewellery and chignons. Even bitter beer drawn by a prize barmaid amidst the glitter of gas, glasses, and mirrors; even dinners *á la carte* and table d'hôte *á six heures* in gilded saloons, may fail to bring down the "fast" young angels if there be any of that character, which is not very likely; so that the enterprising tradesman of this world, the citizen "of credit and renown," must be content to polish his windows, burn his gas, and display his wares for the attraction of mundane customers only, "the nobility, gentry, and public," as he is apt to style them in his advertising circulars.

Mental light and physical light are not necessarily always associated, since it is very possible for a bright mind to dwell in a dark place; but in general it will be found that mental light has affinity and liking for physical light, and that intelligence provides itself as copiously as it can with sunbeams, moonbeams, and starbeams, or in the absence of these, with gas-jets, lamps, or candles. Artificial though they are, there is something inspiriting about them, and as outward and visible signs they may betoken some inward and spiritual grace. The so-called dark ages were probably more deficient in that kind of physical light produced by the science and ingenuity of man than even in that mental light the scantiness of which has caused them to be styled "dark." Tenebræ of both kinds hung heavily over them, and after night-fall particularly, the general condition of the world must then have been rather too shady. If there were "marble halls" in those days, they were not "halls of dazzling light," and the "gay and festive scenes" at night were probably more noisy and carnivorous than brilliant and airy. It did not require much light to shew men the way to their mouths.

It is pleasant to see that since those days there have been lights of all kinds found out, set up, and made to shine; lights in the high-

ways and streets, lights for guidance and warning upon rocks and headlands, lights upon the seas, and what is still better, lights of intelligence and love in the understanding and the heart of man. Some of this latter description of light is not in all respects quite so pure and brilliant as one could desire; but it may be better than none at all, and we must accept and use it for what it is worth and as far as it goes. Some of it perhaps might as well be put "under a bushel," and burn quietly out into modest extinction as set upon a conspicuous candlestick to flare and splutter, offending the nostrils instead of gladdening the eyes; and some of it too is so imperfect in its combustion as to yield more smoke than flame; but making allowance for all drawbacks and deficiencies there is real increase of light and real improvement in its quality. Even when its intellectual intensity is not sufficient to justify its being set upon a hill to illumine a city, it is still in many cases bright enough and good enough to cheer the family and adorn the home. With some degree of reverence and thankfulness, we may say, "Twinkle, twinkle, *little* star," when it happens to be little and not big, and especially if its little twinkling is earnest and spiritual up above the selfish and sensual world so high, "like a diamond in the sky."

Lights! would that we could see them a little more distinctly just now upon the horizon of the political and social world! Would that we could see them in the unhappy realm of France, displacing that misleading "ignis fatuus" which the French have called "Glory," and have followed with a wild impulsiveness, tending to the lowest depths of ruin! Oh, that the misleading lights of vanity, conceit, overweaning national arrogance and pretension had been put out, and a little steady beam of calm wisdom and justice, taken its place in the mind of that highly-gifted and ingenious people! We would too, that a genial light, the light of sympathy, generosity, and humanity, would shine in the mind of that great German people who have so nobly chastised the arrogance that presumed to meddle with their internal concerns, but who may perhaps need in their turn a little friendly entreaty, not to overstep the limits of justice and moderation, and to take care lest a great success should generate a great pride, and change the pure and beautiful light of patriotism into a dangerous and aggressive flame! Would that the light, not "of other days," but of these days, would dawn upon the mind of that poor old "infallible" gentleman at Rome, who fancied that at his bidding the Sun of Thought would stand still on Gibeon, and the Moon in the valley of Ajalon! Would that there were among the swarms of ornamented retainers about courts and thrones here and there, a "pretty page" that really had the capacity and the dis-

position to "look out afar" and tell the rulers what lights of change are gleaming on the public mind, what old things are necessarily and inevitably passing away, what other things are providentially rising and becoming new.

"Mea Lux!" says Cicero, writing to Terentia, and the expression conveys a pleasing idea of the respect and fondness between him and his immediate family. Would that every man could say of his wife or child, "Mea lux!" Would that light ever mingled with the affections, intelligence with love! Would that the reverence of the mind could always accompany the yearnings of the heart! At present it is to be feared that many a man who says to his wife or daughter, "my dear!" in all sincerity, could not with equal truth say, "my light!" Many a pretty fond creature that fascinates intensely for a time, has rather a vacant mind and darksome understanding, the eyes may be very brilliant but the soul is rather dull. Hood in one of his witty poems, says of a blind man who had been operated on by an oculist, and then saw his wife for the first time,

"And when his eyes were opened,
He saw her very *plain*."

So, we fear it sometimes proves with romantic lovers, married in the first impulse of passion. When the light comes into their minds it does not corroborate the love in their hearts, unless indeed the light comes into both minds at the same time and in the same degree, a coincidence which is quite possible and much to be desired. The time may come by and by when light as well as love will be present at every betrothment and wedding, and when youths and maidens will fall in love with their eyes open instead of shut.

At this season of the year on the cold dark seas, we trust that light will find its way into the cabins and forecastles of the many homes upon the deep. Though far from the lights and joys of the home ashore, we hope that bright and happy memories of loved faces and places will steal in upon the sailor's heart, cheering him in his loneliness and helping him to do his duty manfully.

And we also hope there will be light abundant and glowing in all the halls and hovels of the land,—light to give a festive and holiday air to the poorest garret as well as to the richest drawing-room,—light from the glowing fire, spreading warmth, comfort, and cheerfulness,—light from the lamps or candles turning out the shadows of dulness and melancholy from the corners of sad homes, apt to be oversha lowed by anxieties and cares,—lights of merriment and fun from the young and the gay,—lights from tender eyes and thoughtful brows of father, mother, sons, daughters, and friends, gathered round the well-spread table or the snug fire side,—lights of thought

and love, and sympathy, and charity,—lights that look upward for their renewal and increase to the great Source of light, hoping and trusting that however faint for a while may be the little pale, flickering, trembling beam of our intelligence here on earth, it is yet destined to brighten "more and more unto the perfect day."

A BIT OF A SAILOR'S MIND.

Bit the Fourth.

A Chaplain who was asked the meaning of "being clothed with cursing as with a garment," replied that it was having a *habit* of swearing.

I notice that a ship has put back with several of the crew sick from being ill-clad, the aforesaid *habit* being about the standing part of a sailor's outfit, with a breadbag full of straw for a mattress.

At a shipping office I saw not long since a deceased sailor's effects being returned from a brigantine, I think from the Brazils. The poor fellow had been knocked overboard by a blow from the boom mainsail in furling it. Now what comfort could that man have had supposing he had been saved? The straw having been emptied to save porterage, the bag's contents were a few light Dungaree jumpers and trousers, very dirty and greasy, and no warmth-giving things of any sort, except a pair of ragged stockings, the whole outfit not worth five shillings. Compare this with the outfit of a sailor forty years ago, when sailors had to find their own small stores of tea, sugar, and butter, which they were generally provident enough to buy when they had the money.

A vessel about 900 tons towed away lately, the captain, pilot, and mate, as usual busy with the tow rope. The captain's reply, when asked if he had his crew, was, "*Only one.*" As soon, however, as the ship began to move ahead, out came a lot of Johns from a tavern and clambered on board, some of them seeing the ship then for the first time, not even knowing the ship. "Is that her?" said one. "Yesh, see old mansh on folkselsh," said another. "Come along here, sailors," said the pilot. "We're not sailors, only rope haulers," said the Johns.

Away went the ship to face a winter's night at sea, and as the wind was fair took steam an extra stage, but even then the sailors were too drunk to loose the topsails, so she had to anchor in an

unsheltered place at the risk of ship and cargo, and a loss of 100 miles in distance, and this is the much boasted improved state of things under the management of landsmen, magistrates, and superintendents. Now mark the difference. In 1840, when sailors used to look up their own employment, and shipmasters could always depend on having their crew as they shipped on board, and sometimes had two months' advance, a ship tows away and after getting into a fair channel makes all sail at dusk, but in a thunder squall she breaks a lower yard, which compels her to anchor, having a spare yard on board she shifts it, and is under weigh before six a.m. on the day following under *all* plain sail. Could this be done now-a-days? Is it any wonder that the wreck chart is so crowded? The drunken crew mentioned above must by law have characters, and to save trouble and please the shipping master, they will be all *very good* for ability and conduct.

May not this state of things somewhat account for the double premiums of insurance paid by English vessels compared with some Foreigners?

It is of no use for greenhorns and landsmen, who have been perhaps only a steamboat voyage, to attempt to frame laws for the merchant service, the common law should extend to the sea as well as the shore, where a policeman has more power over the liberty of a wrong doer than the captain of a ship like the *Great Eastern*, whose crew bind themselves by articles to obey, etc. In fact, the marine of H.M.S. *Hector*, who got four dozen, and two years, and part solitary confinement, did just what is quite a common occurrence in the merchant service, and has to be passed over. A shipmaster abroad gets imprisoned for restraining a mutinous seaman.

The English captain should have the same authority over his crew as the foreigner with whom he is obliged to compete on very unfair terms. "*No work* can be got out of an English sailor now in harbour," is the remark of foreign shipmasters as well as English, but the majority of the men in the jails of our outports are now sailors, and no wonder, as when unemployed they are loafing about the worst of neighbourhoods, the low grog shops, and brothels, which invariably surround the shipping offices, where their habits put one in mind of some not very beautiful lines I once heard:—

There he mopes all day long,
Thinking little of aught or t'other,
Drunk each night to bed he goes,
Happy beggar.

THE SOLAR ECLIPSE.

On the 6th December, H.M.S. *Urgent* left Portsmouth, detailed by Government, for the purpose of conveying the astronomers and other gentlemen interested in observing this phenomenon, to their destination; some only, however, left in the *Urgent*, others followed overland.

The expedition consisted of four distinct parties, the first for Cadiz, the second for Gibraltar, the third for Oran, and the fourth for Sicily, and as each party is under the leadership of men well known in the scientific world, if the weather and clouds only favour them for the few minutes of the time of the eclipse, we may expect important and conclusive results. Careful instructions have been drawn up by the Royal Astronomical Society for the guidance of the several parties, and although delays occurred in consequence of a ship not being allotted for the purpose, which necessitated considerable haste in the preparations, still we believe that nothing was neglected to ensure success.

In consequence of the lateness in the month (22nd) on which the Eclipse took place, we can give no account of the results of the expedition, but we hope in our next to place before our readers a succinct account of each party, as gentlemen attached to them have kindly consented to forward us communications on the subject.

We may add that the United States Government have voted a liberal sum to enable the astronomers of that country to come to Europe for the purpose of observing the Eclipse, and although working independently, may be said to be in perfect unison with their fellow-workers of this country.

An accident unfortunately occurred to the Sicilian party, by the *Psyche*, the vessel sent to convey the party from Naples to Sicily, striking on a rock off Catania, but as no lives were lost, and the instruments saved, we can but hope they will have reached their destination in time to take part in the observation.

We are glad to know that several of the class of gunboat of which the *Staunch* is the prototype, are in the course of construction, and only wish we could congratulate the country on a hundred of such small craft being in hand, as we are convinced that, in the event of a war, they would be most useful—and be wanted.

SOCIETIES.

MEETINGS, ETC.

GEOGRAPHICAL.—The Session of this Society commenced on the 15th November, under the presidency of Sir Roderick Murchison, Bart.,* in the lecture room of the Museum of Practical Geology. The evening was taken up with the President's address, the last received accounts of Dr. Livingstone, and an account of the journey and murder of Mr. George W. Hayward, the recipient of the gold medal of the Society, whose undaunted efforts in the cause of Geography in his journey of Exploration towards the Panier Steppe, would seem to have deserved a better reward than the untimely death he has met.

On the 29th November, a paper was read by Captain Sherard Osborn, R.N., F.R.S., on "The Geography of the Sea-bed."

The author gave an account of our present knowledge of the configuration of the bed of the ocean, as derived from Admiralty surveys and Submarine Telegraph expeditions during the last fifteen years. The first general feature pointed out was the absence from the sea-bed of those great and abrupt inequalities which distinguish the surface of the land, and the softer undulations and greater levelness were attributed by the author chiefly to the planing action of currents. So level is the bottom of the Indian Ocean, that Captain Halpin, in laying the Indian cable, stated that for hundreds of miles there was no variation in the dynamometer of the cable's descent, and that it could have been laid at the full speed of the *Great Eastern*. Another important general fact that had resulted was the proof of the error of all former statements of the very great depth of the ocean. No depth had been found greater than 2900 fathoms. It was true the Pacific had not yet been investigated; but a number of soundings had been taken in the North Pacific, and they showed a maximum depth of less than 3000 fathoms. The author entered into details regarding the submarine valleys of enormous breadth and length that had been established as existing in the Atlantic and Mediterranean, and also described the submarine

* A few days after the opening of the Session, the veteran President was seized with paralysis, and although hopes are entertained that his life will be spared, we much fear the Society, of which he may virtually be said to be the founder, cannot expect his health will be sufficiently reinstated to resume his duties as their chief.

plateaux and the temperatures at different depths. He concluded by expressing the thanks of scientific men and others to Admiral Richards, Hydrographer to the Admiralty, under whom the great recent progress in deep-sea soundings had been carried out.

Professor Huxley expressed his dissent from the author of the paper, with regard to the great difference alleged to exist in the surfaces of the sea-bed and of the land; a difference which, he contended, would not appear if both were drawn on a true scale. This, however, only applied to the great general features of the surface; it took no account of the minor irregularities, which, on the land, were caused by the corroding action of rain and rivers. He was opposed to the view that the animals found living in the dark regions of the lowest sea-depths depended for light on the phosphorescence of some of the species, and saw no reason for concluding that they would not exist without light. He also doubted the accuracy of the very low temperatures found at great depths, and thought that those taken in the Indian Ocean might be explained by the fact that they were taken with thermometers not rectified for pressure. He concluded by giving warm praise to the British Government for the great work they had encouraged in these deep-sea surveys, and maintained that they had been unjustly assailed for their refusal to aid in furthering science, which they were ready to do whenever a good case was made out for their giving assistance.

Mr. Gwyn Jeffreys was convinced, from the soundings he had himself taken, that there were great inequalities in the bed of the North Atlantic. In one case, the same dredging gave depths of 1055 and of 740 fathoms. In the same sea, gravel was very widely spread over the bottom, and there were often extremely rough flints, which, he thought, would be dangerous to submarine cables. Many of the animals he had dredged up from great depths were amply provided with organs of sight, showing that light was there existent. The submarine cable of the Mediterranean was subject to the attacks of boring animals—a mollusk and a crustacean.

Captain Sherard Osborn concluded the discussion by adducing, as further proof of the levelness of the deep-sea bed, the fact that the grapnels used to recover the severed cable of 1865 (only two inches in thickness) swept across the bottom for more than 100 miles; and, in crossing the cable, scarcely ever failed to hook it, which could not have happened had there been abrupt inequalities of surface.

On Tuesday, December 13th, Lieutenant G. C. Musters, R.N., read a paper on his recent journey through Patagonia, from the Straits of Magellan to the frontier of the Argentine Republic. The

author, having determined on this journey, landed at the Chilian Penal Settlement of Punta Arena, in the Straits, on the 15th April, 1869, and, having procured the good-will of the Governor, was permitted to accompany a party who were despatched across the country to recover some runaway convicts at the mouth of the River Santa Cruz. Here he made a friendly arrangement with Orkeke, the cacique of a tribe of Patagonians, to traverse the country with them as far as the Rio Negro. He studied their language and manners, and joined them in their hunting parties: the country abounding in game, chiefly guanaco, the three-toed ostrich, and the puma, or American lion, the latter of which was eaten as well as the rest. Frozen rivers and heavy snow-falls prevented their starting from Santa Cruz before the 12th of August. They travelled at first in a westerly direction, until reaching the foot of the Cordilleras, along which they marched for upwards of 700 miles to the upper waters of the Rio Negro, making a short, but important, detour across the River Limay in the Cordillera due east of Valdwia. The author described the streams crossed throughout the route, the physical nature of the country, and its chief productions, and gave also long and most interesting details of the manners of the wild tribes, including an account of hostile encounters with other tribes. He stated that, when not excited, the Patagonians manifested a good-tempered and generous disposition, and that they were remarkable for their affection to their wives and children. The women have the whole charge of the tents, constructed of poles and guanaco skins, and the march of many months was an almost continuous chase after the game of the country. Every morning the chief gave his orders for the day in a set speech. The men, on starting, spread themselves over a wide space in the plains, in a crescent form, the more advanced of whom on each side, travelling fastest, as the whole cavalcade moves on, meet in front, and thus enclose the game in a circle; the women and children with the baggage-horses, forming the base line of the crescent. In the earlier part of the journey four such marches were made in succession, averaging eight or ten miles each; then followed a rest of several days, in places where pasture was abundant. Lieutenant Musters was altogether more than a year with the tribe, who had come to look upon him as one of themselves. In May, 1870, he crossed the country again from west to east, and on the 21st of that month arrived at the Argentine Settlement of Patagonia, near the mouth of the Rio Negro. The climate of the country, in which he reached north of 40° south latitude, he describes as cold and ungenial; snow fell at midsummer, and the greatest heat experienced in the warmer months was only 65°.

ASTRONOMICAL.—A valuable and interesting paper on the precession of the equinoxes has been laid before the Royal Astronomical Society by Colonel Drayson, R.A., F.R.A.S. A most significant fact was stated which, assuming it to be mathematically determined, corroborates in a remarkable manner the theory of the glacial epoch of geology. The movement of the axis of the earth round the pole of the ecliptic as a centre, has long been accepted by astronomers as a solution of the problem known as the precession of the equinoxes. Col. Drayson however, after long and careful study, has arrived at the conclusion that the centre of the circle described by the movement of the earth's axis is not on the line of the ecliptic, but is actually six degrees from it. His calculations seem to point unerringly to this conclusion, for they agree exactly with recorded observations of past times; they also agree to within one-tenth of a second with the observations of the present day.

The striking result of this discovery goes to prove that about 13,000 B.C. the circle traced by the pole was such as to have caused an Arctic climate to have prevailed in England, and over the whole Northern hemisphere down to fifty-four degrees of latitude, which condition fully explains the well-known glacial epoch of geology. The changes of climate in successive ages marked by geology are due to the same cause, and the dates can be calculated. The proper motion of the fixed stars and the moon's changeable rate, as indicated by eclipses, are also problems affected by this discovery.

Its importance must claim the attention of all astronomers, especially considering that for about a century no striking fact in geometrical astronomy has been brought forward.

COMMUNICATIONS.

MACABI ISLANDS.

THE following particulars have been received from Mr. William Hall, of the barque *Glenisla*, loading with guano at the Macabi Islands, on the coast of Peru, six and a half miles south by west of Malabriga Head. The information is collected partly by himself and partly by Captain Gaspar Ureta, of the Peruvian navy.

The guano loading company have commenced working on the North Island, where Mr. Hall states the guano is about thirty-two feet thick. The south island is much larger than the north, but no

operations have yet been begun thereon, although the quantity of guano on it is said to be very great. There is a narrow passage between the islands, navigable only for boats. A bridge is being erected over it, and it is believed that the engineer in charge of the islands intends to fill up the eastern entrance, with a view to working the South Island.

Anchorage of some sort can be found at almost any part of the islands, except on the south side of the South Island, but the bottom is rocky, and in many parts vessels would be exposed to prevailing winds and other risks. The best anchoring ground is on the north side of the islands, from half a cable to three cables from the shore, where there is from nine to eighteen fathoms of water, with a sandy bottom. Ships coming from the southward, and wishing to get into this anchorage, must come to the north-east part of the island, and when distant about a mile from the islands, steer north-west until the opening between the islands is open, then haul up under the North Island, have both anchors ready, and as soon as both islands are in one let go. It is best to keep to leeward if there are many other ships there.

The trade winds blow regularly during the day from south to south-south-east. During the night the wind blows from south-east to east-south-east. Calms are scarcely known, there being always a light breeze. Fogs are very frequent and very dense from December to April, and ships making for the islands should not run their distance too fine, but haul up until the fog clears, which it generally does about mid-day. The islands are easily passed without being seen, and ships would have great difficulty in beating back as a strong current sets dead against them.

The current as experienced runs at about two knots from the south-east during the full and change. At other times it varies, being occasionally scarcely perceptible. In anchoring, ships should run out a stern mooring to prevent sheering about.

The barometer ranges from 30 inches to 30° 20′, the surface temperature is 58°. The air at night and morning 60°, at noon 66°. A heavy dew falls every night, and the islands are generally enveloped in fog early in the morning.

THE MONITOR RAFT.

The following letters from our esteemed correspondent Capt. Forbes, at Boston, have reference to our last volume.

Boston, 16th November, 1870.

SIR,—Captain Luce, of the U. S. Navy, alluding to the Monitor Raft in the Army and Navy Journal of 12th instant, suggests that a small one fitted with two short oars and means for showing a light should be placed on board of vessels of war in place of the usual life buoy, and that a competent man should go with it and pull it to the man overboard; this would be very well if the right man happened to be ready. I think, however, that a life buoy on the principle of the Monitor Raft as to shape, should be made of two copper cylinders, or of wood filled with cork; the air float of rubber is almost too buoyant, and has a tendency to be thrown rapidly to the leeward, whereas metal, or wood and cork would be driven to leeward less rapidly.

Whatever form a life buoy is to take, there ought to be a few fathoms of line attached to a drag, made like a pudding bag log chip, this will prevent its driving fast to leeward. It very often happens that a man falling over turns his attention first to getting his heavy jacket off, and then swims for the life buoy. Sometimes it goes faster than he can swim, this would be the case with a Monitor Raft life buoy, unless a drag goes over with it, and unless a man goes also,—and this we must look upon as likely to be rarely done in a fresh breeze and lively sea. I trust this suggestion in regard to life buoy drag will meet your approval.

I am, very faithfully yours, R. B. FORBES.

Boston, November 17th, 1870.

SIR,—In your November number, page 594, after the heading "Monitor Raft," comes the date, "Boston, 10th Sept., 1867," which slipped in by some mixing up of the extracts with my date, which I think ought to have been about the 10th Oct., 1870. Again, at page 596, following the extract from Halloway's letter, comes what I wrote about Delvigne's gun; it looks like a continuation of the extract; it ought to have appeared as a note to the first lines on page 594.

I have designed a rig for an ironclad frigate, which has three fore and aft masts and one square rigged, all on my new plan. I shall send you a sketch soon, also some of my mode of rigging boats. I am, very faithfully your servant,

R. B. FORBES.

To the Editor of the Nautical Magazine.

[We are unable to print the article entitled, "Something about Ships" in this number, but hope to notice it in February.—ED.]

NEW BOOKS.

Elementary Manual for the deviations of the Compass in Iron Ships. By F. J. Evans, F.R.S., Staff Captain, R.N., etc. London: J. D. Potter. 1870.

This work is intended as an introductory text-book to that most useful publication the Admiralty Manual for the deviation of the Compass. The great importance and utility of the latter work is undoubted; it has been translated into French, German, Russian, and Portuguese, and is held in high esteem among all nautical people. But its full scope can only be appreciated by those who have gone through an advanced mathematical training, and it is difficult for the student or navigator to master the theory and practice of compass deviation by its aid alone.

So to bring practical knowledge within easier reach of the many, Captain Evans has brought out an Elementary Manual. Considering the author's long experience and intimate acquaintance with the subject of compasses, he justly remarks, that the task of preparing such a work seemed naturally to devolve on him, and this assumption is most fully borne out by the work itself, which is really what it professes to be, a useful and intelligible compendium of all that the most competent navigator requires to know on the subject of the deviation of ths compass. His general observations on the compass (Section 1) are very much to the point, and deserve particular attention from all nautical men. The catechism style of the work is not much to our taste, but being intended in a measure for students, it no doubt has its advantages. We feel sure that the intrinsic merits of this Manual will make it as popular as any class publication can expect to be; it will be invaluable to the student, and is by no means to be despised by the educated and experienced mariner.

The Law of Blockade: its History, Present Condition, and Probable Future. An International Law Essay. By Bargrave Deane, B.A. London: Longmans and Co. 1870.

Mr. Deane has furnished us with a useful little book at an opportune time. In these days of war's alarms, it is well that we, who go about the world a good deal, should thoroughly understand our position and duties as respects our maritime relations with other countries, be we or they neutral or belligerent. All kinds of important questions are dependent on a clear understanding of what is right or wrong in international communications when war

stalks abroad. Questions affecting national honour, commercial enterprise, and the safety of ships are all involved in the law of blockade, and any one who adds to the general knowledge on the subject is worthy of general thanks.

The Essay before us though small is comprehensive. Mr. Deane tells us that the origin of blockade must be sought for in the Law of Nature. To us, there is a little vagueness here. We must confess that our search in this direction leads us to suppose that he alludes to blockades effected by natural causes, such as the ports of the Baltic and other parts are subjected to at certain seasons of the year. We reach firmer ground where he treats of the first rude impulses of humanity, and endeavours to shew the existence of the germ of a blockading spirit, "as exemplified by the acts of uncivilized men in early times." Tracing out the further development of this spirit, we are led through successive centuries, brought face to face with many interesting facts, and the opinions of eminent jurists of all ages who have laid down the law on the subject, and at length we reach our own times, with regard to which the law of blockade is clearly and concisely enunciated. Mr. Deane goes still further and dips into futurity, speculating upon what may be the probable future of the law of blockade, but into this region we do not propose to follow him; indeed, we are inclined to think it a subject hardly worth speculation as to what its future may be. It seems to us that little can be predicted about it, and even that little is of small practical value to us. The interests of nations will always operate to prevent it assuming any very alarming features; and therefore, on the whole, we think it one of those matters of which it may truly be said, "Sufficient for the day is the evil thereof." But at the same time we must allow that the very intelligible and useful exposition of what now constitutes a blockade, and what is an infraction of the international law in regard to it, cannot fail to be of the greatest service to all interested in nautical affairs, and particularly in these war times. We therefore think all praise is due to Mr. Deane for his work, which has not been performed without considerable labour, and we are heartily glad that he has been induced to publish his essay.

The Education and Status of Civil Engineers in the United Kingdom and in Foreign Countries. Compiled from Documents supplied to the Council of the Institution of Civil Engineers, 1868 to 1870. London: 1870.

This publication is hardly one that requires review, but we are nevertheless glad to be able to notice its advent, because we heartily

sympathise with its object. Looking at the question from the point of view which interests us, we confess we have at times been somewhat startled to think how much marine engineering work has been taken out of English hands. The noise of the thousand hammers in the shipbuilding yards on our river sides has fallen off very considerably of late years; it is well known that steam-engines, boilers, and machinery of all kinds have been (until the outbreak of war) constructed on the Continent, as well as, and more cheaply than, on the Thames. Loud cries from alarmists have been frequently heard about the depression of trade and the decay of England's industrial greatness, and we have not been able to disguise from ourselves that there is some element of truth in it all; so we gladly welcome any sign of an effort towards improvement in this respect, and we take this book to be such a sign.

With the view of ascertaining the position of engineering in England as compared with that of other countries, the Institution of Civil Engineers has judiciously collected a number of facts and opinions concerning the state of things at home and abroad, and, with very little comment, has left the evidence thus gathered to speak for itself. The result would seem to show that while we still are pre-eminent as *practical* engineers, we are not so good as we might be in *theoretical* knowledge. The evidence itself is of great interest, especially to engineers, but regarded as a preliminary step towards the improvement of the education of engineering students, it has a far higher value, as giving hope of a recovery of our departed engineering business, and thus bearing directly on our national interests.

THE Fishmongers' Company are about to publish Mr. Hoare's "History of the Deep Sea, Coast, and Estuary Fisheries of Great Britain and Ireland." The work will be very voluminous and interesting, as it embraces every important transaction that has occurred in connection with our fisheries, both in British and foreign waters, from the Saxon era down to the present time. The appearance of the work just now will be all the more important, as its author has carefully followed the history of our fishery operations on the American coasts, which he has traced back to the reign of Queen Elizabeth, in a comprehensive manner that may greatly contribute to an amicable and satisfactory solution of the serious question which now endangers the friendly relations hitherto existing between the two countries.

MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
121	England—East Coast—Smith's Knoll	A black conical buoy has been placed on it.
	" Thames—Maplin Sands...	Alteration of buoyage in consequence of extension of the sand.
122	Ceylon—N. E. Coast—Moeletivoe ...	Extension of Shoals.
	India—West Coast—Vingoria Rock	Establishment of a light.
123	England—Liverpool bay entrance ...	Alteration of buoyage in Queen, Victoria, and Horse channels.
124	England—East coast—Souter point...	Establishment of light postponed.
	Tynemouth Castle	Alteration in light postponed.
	Coquet Light ...	Do. do.
125	United States—Chesapeake Bay,	Exhibition of a light from a lighthouse and removal
	York Spit ...	of light-vessel.
126	England—West Coast—Bristol Channel	Sully Island—removal of temporary light-vessel from Wreck of "*Golden Fleece.*"
	East Coast—Yarmouth Roads	Scroby Fork buoy. Alteration in position, etc.
127	California, Point Reyes	Establishment of a light.
128	England—Bristol Channel Nash Lthe.	A red ray of light in direction of Tusker rock.
	East Coast—Corton Gatway	Gatway no longer safe to any but small vessels.
129	Norway—West Coast—Skog Nits ...	Establishment of a light.
	Flaeviir ...	Do. do.
130	Red Sea—Suez Bay entrance	A sunken rock lately discovered.
131	England—West Coast—Milford Haven	Great Castle head. Est. of two leading lights.
	Bristol Chan.—Flatholm	Extension of red sector of light.
132	England—East Coast—Souter Point	Exhibition of light on Dec. 22. } Subsequently post-
	Tynemouth Castle	Alteration of light on Dec. 22. } poned till on or
	Coquet	Do. do. } about 11th Jan.
	Spurn Point ...	Red sector of low light, removed to upper light.
133	Sweden—Kattegat—Tylö Island ...	Establishment of a light.
	Utklippan ...	Alteration in light.
	Landsort ...	Alteration in light and additional leading light.
	Carlskrona harbour	Establishment of leading lights.
	Sando	Do. do.
	Winga Lighthouse	Establishment of fog-signal.
134	West Indies—Cuba—Baracoa ...	Establishment of a light.
135	Mediterranean—Adriatic—Salvore Point	Establishment of a light.
136	Madeira—Lourenzo Point	Establishment of a light.
137	America—California—Blanco Cape...	Establishment of a light.
138	England—South Coast—Dungeness	Erection of a beacon on the point.
	Do. do.	Limits of the *red* light in East Bay.
	West coast—Dee river ent.	Alteration in buoyage.

(All bearings are Magnetic.)

121.—*England—East Coast—Smith's Knoll.*—A large black conical buoy with staff and globe, has been placed on Smith's Knoll in lat. 52° 51½′ N., long. 2° 12½′ E.

Charts affected, Nos. 2902a, 1630, 2339, and 2182.

River Thames—Maplin Sand Buoys.—In consequence of the extension of the West Maplin Spit, a black can buoy has been placed S.W. ½ W. four cables from Maplin lighthouse. Maplin Spit Buoy has been moved and now lies S.E. by E. ¾ E. two cables from Maplin Lighthouse. East Maplin Buoy now lies N.E. by E. ¼ E. seven cables from the lighthouse.

Charts affected, Nos. 1610, 1607, and 1975.

122.—*Ceylon—Moeletivoe*—Extension of shoals. These shoals have extended seaward. Vessels should not approach them into less than 20 fathoms water. Note abreast the shoals on the chart.

Charts affected, Nos. 2301, 70*a*, and 748*a*.

India, West Coast—Vingorla Rocks—New Light. A light 110 feet above the sea has been established on the outermost of the Vingorla Rocks or Burnt Islands. Position lat. 15° 53′ 20″ N., long 73° 26′ 40″ E.

Charts affected, Nos. 740, 2736, and 2737.

123.—*England—Liverpool Bay Entrance*—Queen Channel.—South bar red can buoy, moved N. ¾ W. 1½ cables, and the black nun buoy of Jordan Bank Spit, N.W. one cable.

Victoria Channel—The red can buoys, numbers 2 and 3, removed, and the black nun buoys numbers 1 and 3 re-adjusted to mark the S.W. and S.E. points of Little Burbo Bank.

Horse Channel—The red can buoy No. 3, moved E.S.E. one cable.

Charts affected, Nos. 1169 and 1951.

124.—*England—East Coast—Souter Point Light, Tynemouth Castle Light, Coquet Light.* See No. 132.

Thames Entrance—Sunk Light, alteration in character. On the 15th January 1871, the present fixed white light will be changed to a revolving light, showing a red and white flash alternately every forty-five seconds. Also for day mark a half ball will be placed above the ball at mast-head.

Charts affected, Nos. 2052, 1975, 2902*a*, 1610, 1598, 2765*a*, and 1406.

125.—*United States—Chesapeake Bay—York Spit*, entrance of York River, New Light. A screw pile lighthouse has been erected in lat. 37° 12′ 20″ N., long. 76 14′ 40″ W., shows a fixed red light 37 feet above the sea, and can be seen 11 miles. Fog bell every fifteen seconds. Light-vessel removed.

Charts affected, Nos. 266, 355*a*, and 2843*a*.

126.—*England—Bristol Channel*—The temporary light-vessel placed near the wreck of the *Golden Fleece*, near Sully Island, in October, 1869, has been removed, there being 12 feet over the wreck at low water springs.

Charts affected, Nos. 1598, 2675*b*, 1179, 2682, and 1182.

Yarmouth Roads.—The Scroby Fork buoy has been moved one cable to the west. The Scroby Sand has grown considerably to the westward between the Scroby Fork and South Scroby Spit buoys. Mariners are cautioned not to stand within the line of the buoys.

Charts affected, Nos. 1630, 1543, and 2902*a*.

127.—*California—Point Reyes.*—A first order dioptric *flashing white* light, flash every 5 seconds, elevated 271 feet, has been established on Point Reyes; should be seen 23 miles. Tower 38 feet high, white. Position, lat. 37° 59′ 40″ N., long. 123° 0′ 15″ W.

Charts affected, Nos. 2461, 2530, and 591.

128.—*England—West Coast—Bristol Channel—Nash High Lighthouse.*—A *red* ray of light is exhibited from a window below the lantern in the direction of Tusker Rock, visible between S.E. ¾ E. and S.S.E. ¾ E.

Charts affected, Nos. 2675*b*, 1824*a*, 1179, and 1183.

East Coast—Lowestoft—Corton Gatway.—The extension of the north-east part of Holm Sand, has rendered the Gatway no longer safe to any but a small class of vessels. Probable discontinuance of the lights.

Chart affected, No. 1543.

129.—*Norway—West Coast—Skog Näs.*—A *fixed red* light of fourth order 57 feet above the sea and seen 12 miles, has been established on Skog Näs, the north-east point of Wägsö in lat. 62° 2′ N., long. 5° 7′ 50″ E.

Flävär.—A *fixed* white light, except in the direction of Skiäggen when it changes from *white to red every three seconds*, of fourth order 56 feet above the sea and seen 12 miles in lat. 62° 18′ 50″ N., long. 5° 36′ 30″ E.

Both the above lights will be exhibited between the 1st August and 15th May.

Chart affected, No. 2305.

130.—*Red Sea—Suez Bay.*—A sunken pinnacle rock with 13 feet on it at low water, lies S. ⅜ W. 1 1/10 mile from the light vessel and S.S.E. ¾ E. 1 9/10 mile from the Kal' ah Kebireh beacon.

To avoid the danger by day, keep the light-vessel on with westernmost minaret of Suez. By night a N. by E. bearing of the light will clear it to the westward.

A small *red* buoy has been placed on the rock.

Charts affected, Nos. 734, 8*b*, and 2523.

131.—*England—West Coast—Milford Haven.*—Great Castle Head. Two leading *fixed* white lights are now exhibited; the upper 112 feet, the lower 76 feet above high water. The two lights in line N.E. by E. ¾ E., lead between St. Ann's head and Mid-channel rock.

Charts affected, Nos. 1598, 2675*b*, 1826*b*, 1410, 1179, and 2393.

Bristol Channel.—Flatholm light. The *red* sector of light has been extended to the westward as far as the Ranie Spit buoy on the bearing of N. by W. ½ W. from the lighthouse.

Charts affected, Nos. 1182 and 2682.

*132.—*England—East Coast—Souter Point.*—An electric first order light 150 feet above the sea, revolving, showing a white flash *every half minute*, will be exhibited on or about 22nd December. Also, another

* The exhibition of this light has since been postponed until on or about the 11th of January.

light will be exhibited from the same tower 21 feet below the other, showing from N. by W. to N. ½ E. and *red* from N. ½ E. to N. by E. ¾ E.

Note.—When the fixed white light is seen, vessels will be in the line of Mill rock and Cape Carr point, and when it changes to red, in that of Whitburn Stile, Hendon rock, and White Stones.

**Tynemouth Castle* light will be changed on same date from a revolving white light to a *revolving red* light.

Charts affected by the two Notices, Nos. 2902*b*, 1192, 2239, 2248, and 1934.

**Coquet light.*—From same date, the following alteration will be made—The red shade from the upper light will be discontinued, the light will then show *white* to the bearing N. ¾ E.

*A second light 28 feet below the above light will be exhibited from the tower; it will show *white* from N.N.W. to N. ¾ W. and *red* from N. ¾ W. to N. by E. ½ E., over the Bondicar Bush Shoal.

Also, the Hauxley buoy will be painted *red.*

Note.—When the upper light is lost sight of, the line of Hauxley point and Bondicar Bush will be passed; while in the *red* light great caution is necessary in approaching the shore.

Charts affected, Nos. 2902*b*, 2339, 2248, 1193, and 1721.

Spurn Point.—From the 1st January the *red* sector shewn from the Low light will be shewn from the Upper: same bearings as before.

Charts affected, 2902*a*, 1190, and 109.

133.—*Sweden—Tylö Island.*—A light established, a *flashing white* light, *flash every ten seconds*, lasting *three seconds*, elevated 56 feet above the sea, should be seen 12 miles. Position lat. 56° 38′ 50″ N. long, 12° 42′ E.

Charts affected, Nos. 2114, 2262, 2842, and 2842*b*.

Utklippan light, elevated to 100 feet above the sea, should be seen 16 miles. *Fixed and flashing light*, flash *every two minutes*, lasting *ten seconds*, preceded and followed by short eclipse.

Charts affected, Nos. 2360 and 2262.

Landsort light—Alteration.—White light with *red* flash *every minute*, lasting about *five seconds*, preceded and followed by short eclipse.

A *fixed green* light in lower part of the tower to mark the channel in the direction vessels should make the upper light.

Charts affected, Nos. 2262, 2361, and 2362.

Carlskrona harbour.—New leading lights, one a *fixed white* light, on East point of Dock yard; the other, a *fixed red* light from a vessel in roadstead. The two in line lead to the anchorage. Gong sounded on board the vessel in foggy weather.

Charts affected, Nos. 2262, 2842*b*, and 2223.

Sandhawer, entrance to Stockholm.—Two new leading lights at the Pilot Station at Sando to guide vessels through the other outer shoals to an anchorage off the pilot station; inner light *fixed white*, outer light *fixed red.*

* These changes have since been postponed until on or about the 11th January.

Charts affected, Nos. 2114, 2842, and 2346.

Winga lighthouse—Fog horn established will be sounded *once or twice every minute*, sound will last about *five seconds*.

134.—*West Indies—Cuba—Baracoa harbour.*—A *fixed white* light 50 feet above the sea has been established, should be seen 12 miles, to facilitate entering the fort. Position, lat. 20° 21′ 40″ N., long. 74° 30′ 20″ W.

Charts affected, Nos. 390, 392*b*, 393, 2580, 486, and 438.

135.—*Adriatic. Salvore point.*—A *fixed and flashing white light*, flash *every minute*, third order, 112 feet above the sea and seen 17 miles, has been established on Salvore point, near Pirano.

Charts affected, Nos. 2158, 2718*b*, 201, 1410, and 1501.

136.—*Madeira—Lourenzo Point*—A *fixed and flashing white* light, flash *every half minute*, second order, elevated 343 feet, seen 25 miles, has been established on Fora Island, lighthouse white, 43 feet high. Position lat. 32° 43′ 14″ N., long. 16° 39′ 30″ W.

Charts affected, Nos. 2060, 1831, and 1226.

137.—*California—Cape Blanco.*—A *fixed white* light, first order, elevated 255 feet, seen 22 miles, has been established in latitude 42° 50′ 7″ N., longitude 124° 32′ 29″ W.

Charts affected, Nos. 2461, and 2531.

138.—*England—South Coast—Dungeness.*—In consequence of the extension of the point, a beacon mast, 50 feet high, with two globes one over the other will be placed 400 yards S.E. ½ E. from the lighthouse.

The limits of the *red* sector of light of Dungeness light, denoting the anchorage in East Bay, are now between S.W. by W. ½ W. and S.W. by S. ½ S.

Charts affected, Nos. 1598, 2675*a*, 2452, and 1895.

West Coast—Dee River Entrance.—In consequence of changes having taken place in Hoyle Sand and Chester Bar, the following alterations in the buoyage have been made—

Chester Bar Buoy moved N.E. 9 cables.

N.E. Middle Patch Buoy moved N.E. 5 cables.

South Hoyle Buoy moved W. by S. ½ S. one cable.

In March, 1871, a *red can buoy* will be placed on the east side of the Salisbury Sand. (A chart of this locality, from a recent Admiralty survey, will shortly be published.)

Chart affected, No. 1169.

CHARTS PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, IN NOVEMBER AND DECEMBER, 1870.

No.	Scale.		s.	d.
99	m = 5·2	French Guiana, Salut Isles anchorage	0	6
2060*a*&*b*d	= 0·6	North Atlantic Ocean, 2 sheets	7	0
93	m = 1·5	Japan, Inland Sea: Akashi-no-Seto and its approaches	1	6

No.	Scale.		s.	d.
1232	m = 1·5	Africa, S.W. coast: Saldanha Bay	2	0
443	m = 4·7	West Indies: Santiago de Cuba	1	6
33	m = 3·6	Baltic: Kiel Fiord	2	6
101	m=various	Japan: Anchorages in Awomori Bay	1	0
21	m = 0·26	Magellan Strait: Second Narrows to Cape Pillar, with views	3	0
23	m = 0·23	South America, Patagonia: Channels between the Gulf of Trinidad and Gulf of Penas	3	0
24	m = 0·23	South America, Patagonia: Channels between Magellan Strait and Gulf of Trinidad.....	3	0
2044	m = 0·56	South America, East Coast: Ilha Grande and Sapetiba Bays	2	6

GENERAL.

ROYAL NATIONAL LIFEBOAT INSTITUTION.—A meeting of this institution was held at its house, John-street, Adelphi, London, on Thursday, December 1st; Mr. Thomas Chapman, F.R.S., V.P., in the chair. Rewards amounting to £86 were voted to the crews of various lifeboats of the institution for going out on service during recent storms. The St. David's lifeboat rescued the crews of three vessels during a severe westerly gale, and in a heavy sea, on the 22nd November. The Mincing-lane lifeboat at Montrose, N.B., was successful in saving the shipwrecked crew of five men of the schooner *Sarah*, of Montrose, shortly before the vessel went to pieces. The Whitburn lifeboat also brought ashore the crew of eight men from the brig *Elizabeth*, of North Shields, which had stranded at Whitburn Steel, on the 18th November. The lifeboat stationed at Cahore, Ireland, was also instrumental in taking safely to Wexford Harbour, through a heavy sea, the fishing smack Dolphin, of Wexford, which had been abandoned by its crew, and was fast drifting on the Blackwater Bank. The second service clasp of the institution, and a copy of the vote inscribed on vellum, were voted to Charles Mitchell, for his gallant services on the occasion of the wreck of the brig *Stephano Grosso*, of Genoa, near Port Isaac, Cornwall, during a heavy gale, on the 24th October last. The thanks of the institution inscribed on vellum and £1 were also given to John Herbert, who, during a heavy gale and high sea, went on board the steamer *Express*, when ashore on Porthdinllaen Beach, by means of a line which had been sent ashore from it, and

afterwards, with the aid of the steamer's boat, assisted to save the crew of eight men. A reward was also granted to some men who assisted on the occasion. £10 were likewise voted to the crews of two Filey fishing cobles for saving the crew of eight men of the brig *Liberty*, of Newcastle, which foundered off the Yorkshire coast. Various other rewards were likewise granted to the crews of shore boats who had saved life from wrecks on our coasts. During the current year, £19,408 had been expended by the society in the formation of new lifeboat stations, and in the maintenance of its large life-saving fleet of 223 boats. In that period the institution had also contributed to the rescue of 918 lives from various wrecks, besides saving 24 vessels from destruction. Altogether the Lifeboat Society had contributed since its establishment to the saving of 20,000 lives from shipwreck. It is earnestly hoped the British public will strengthen the hands of the Committee to carry on the great and national work of the Lifeboat Institution. The trustees of the late Mr. William Thorngate had, through Mr. Henry Compigné, sent £80 to the funds of the institution; and Captain J. A. Perry, of the steamer *Humboldt*, had collected £5 for it. His Grace the Duke of Buccleuch had likewise become an annual subscriber of £10 10s. to the society. T. B. had also given it £300 railway stock, bearing interest at 6 per cent. A new lifeboat had recently been forwarded to Kessingland, Suffolk, and had been publicly launched there. The boat was the gift to the institution of the people of Bolton.

Captain Sherard Osborn complains that Earl Russell has misrepresented him in his letter about the national defences. Earl Russell says that Captain Osborn advised "to line our east and north-east coasts with ships of war," proving thereby that he did not feel the security he professed for our safety, even if the Scheldt was in the hands of an enemy. "Now my object," Captain Osborn says, "was to assist, by my humble testimony, in dispelling the illusion that the safety of Great Britain was identified with that of Belgium, or that the Scheldt was a pistol pointed at the heart of England, or the key of the North Sea, as ancient saws led many to suppose. I tried to show that natural ports on the opposite side of the North Sea could be neutralized by artificial ones constructed on our own coasts, and pointed out how strange it was that from the Thames to the Orkneys, along the whole eastern seaboard of England and Scotland, where our cities and merchant shipping were open to attack from the Baltic to Dunkirk, no harbour of refuge existed into which vessels could run for shelter, or where

our war ships could assemble in case of hostilities. Beyond this I do not go, though I lamented the want of proper vessels in our navy for our own coast defence, and in that regret I have been more than justified by the lamentable failure of the French ironclads to do more than a little piracy in capturing German unarmed traders; and I know only too well that on the bad model of the French ironclads our Admiralty have long persisted in constructing our fleet."—*Pall-Mall Gazette.*

On the 3rd was launched at Sheerness the paddle-wheel dispatch vessel *Lively*, of 835 tons; 250 horse-power. This vessel was commenced in April last, and was therefore only eight months building. Her length between perpendiculars, 230 ft.; for tonnage, 200 ft.; breadth for tonnage, 28 ft. 1½ in.; depth of hold, 14 ft. 6½ in. The *Lively* will carry only two guns.

The inauguration of a statue of that greatest of navigators and discoverers, Christopher Columbus, at Aspinwall, on the Isthmus of Panama, is an event not to be passed over in a magazine devoted to maritime affairs, without notice. The statue was erected at the expense of the ex-Empress of the French, herself a descendant of those for whom the great admiral accomplished so much, and on whose country he shed such honour. Strange to say, not one Spaniard was present at the inauguration, the post of honour being filled by an Englishman. As Columbus was the first to make the great continent of America known to Europe, it seemed something of a coincidence that the man who presided at the inauguration should have been the first to connect the two continents telegraphically, Sir Charles Bright.

The Trinity House has addressed a circular letter to the leading shipowners and marine societies in London, proposing to make a bye-law to license skilled men—upon such examination as would not exclude any practically qualified person—to pilot, at low rates, coasting vessels navigating between London and Gravesend which may be now exempted, but which, if employing a pilot, are bound to take a licensed man (if his services are offered), and pay him at the regular pilotage rates.

During the past summer the wreck of the *Golden Fleece* off Sully Island in the Bristol Channel, has been the scene of interesting submarine operations by a Corps of Royal Engineers, under the immediate direction of Colonel Gallwey and Lieut. Moore, R.E.

The vessel was sunk in a position most dangerous to navigation, and the efforts of the Engineers have been devoted to "dispersing" her by means of submarine explosions. For some little time the wreck was obstinate and would not give way to the persuasive force of gun-cotton and gunpowder; but after repeated attempts small portions of the iron have been dislodged, and ultimately a uniform depth of eighteen feet over all parts of her obtained, and thus the dangerous obstruction to navigation has been to a great extent removed. The position of the remains of the wreck is marked by two buoys, one on each side, east and west, and at low water navigators should give the buoys a tolerably wide berth.

"THE *New York Tribune* in speaking of the United States navy, says that it does not contain a single sea-going ironclad. A few 'iron death-traps,' as the *Tribune* calls the monitors, yet remain in a serviceable condition, and could be made useful for harbour defence; but in the writer's opinion they are not worth counting. 'We have some forty odd vessels of all kinds in commission, and about as many more laid up at the various navy yards that could be fitted out and made serviceable in a few weeks—wooden vessels all of them, and most of them small, useful for cruising and capturing merchantmen, or for blockading purposes, but of small account as fighting ships, when fitted against such powerful ironclads as the *Monarch* which visited our shores last spring. Nor have we, like Great Britain, a steam mercantile marine that could be made available in case of war. As far as naval strength is concerned, the United States is not even a second-rate Power. If we want to fight England, therefore, we must first spend at least 100,000,000 dollars to create a navy to meet her."

A NEW lighthouse is in course of erection on Great Basses Rock, Ceylon, under the superintendence of Mr. William Douglass, who has been engaged in similar important works in England. The work has been undertaken by the Trinity House at the request of the Board of Trade, and the exceptional difficulties of building a lighthouse on the exposed rock of Great Basses, will no doubt be satisfactorily got over by the directing power and executive staff, which have already raised up numerous "pillars of light" on isolated rocks round our coasts.

During the fine weather of last year the foundations were prepared, and arrangements made for a regular service between the land and the rock, and it is expected that ere long a considerable quantity of the stone will be set up.

THE

NAUTICAL MAGAZINE.

NEW SERIES.

FEBRUARY, 1871.

THE SOLAR ECLIPSE, 1870.

ALTHOUGH many of our readers may be in full possession of the results of the expedition of observation of the eclipse, and although we may not be able to add anything to the numerous published accounts that have appeared in the daily and weekly press, yet, for the benefit of our colonial and foreign friends, we propose to give a general account of the proceedings of the expedition, and the results of the observations made.

At the same time we would remark, that beyond affording additional proof of the reliability of astronomical calculations, the observations have no direct bearing on the science of navigation; but the matter is of such importance to all men of science, and has so great a general interest for those who are concerned in the progress of cosmical knowledge, that some account of the phenomenon will surely not be out of place in this Magazine.

The physical constitution of the sun is a subject that has long occupied the attention of scientific men, and, especially of late years, every opportunity has been taken advantage of to increase our knowledge on this point.

The spots on the sun, their progress across the disc, and their changes in form and extent could be watched from day to day, but certain other phenomena known as the solar prominences, Baily's beads, and the corona, could only be observed when the moon during a total eclipse, shut out the light proceeding direct from the sun.

The expeditions to watch the eclipses of 1860 and 1868 were

made in order to observe and obtain more accurate information on these points. After that of 1868 it was discovered by M. Jannsen, French observer at Aden, and by Mr. Lockyer, in our own country, that under favourable conditions, by using spectroscopes of great dispersive power, the prominences could be observed without the sun being eclipsed.

The extraordinary phenomenon known as the corona could not however be observed by this means, and the observations made in America in 1869 having failed to solve the problem of its constitution, although corroborating the theory of its existence, expeditions were organized to observe in Spain the total eclipse which occurred in December, with the view if possible of clearing up the question, or at all events of obtaining some additional valuable information concerning it.

Accordingly a committee of gentlemen from the Royal and Royal Astronomical Societies were deputed to ask assistance from the Government for this object, and after some delay, the Government promised to provide a ship and a grant of £2000. Eventually observing parties were arranged to take their positions in Spain, Africa, and Sicily, along the line of totality. The map in the frontispiece gives a section of the line of the total phase, shewing its path across Spain, Africa, Sicily, Turkey, etc., and the positions chosen for observation were Cadiz, Gibraltar, Oran, and Sicily. H.M.S. *Urgent* was the vessel given to carry out the parties to Cadiz, Gibraltar, and Oran, and she was to leave Portsmouth on the 6th December. The parties for Sicily were to proceed overland to Naples, and then be conveyed in a ship of war to Palermo.

For the present we will follow the party, or rather the three parties in the *Urgent*, an interesting account of whose proceedings on the voyage, together with a special account of the doings of the Cadiz section, have been most kindly furnished us by Captain Maclear, R.N.

The *Urgent* had on board thirty-one passengers, divided into three detachments, viz.: twelve for Cadiz, under the direction of the Rev. S. J. Perry, of Stoneyhurst College; ten for Gibraltar, under Captain Parsons, R.E.; and nine for Oran, under Mr. Huggins. Each detachment was composed of a certain number of observers with the spectroscope and polariscope, and of others for taking accurate sketches of the form and extent of the corona, whilst the Gibraltar section had an able photographer. These detachments were on arrival to be broken up into smaller parties, to take up as many stations as possible, so that, in case of bad weather, some might succeed in observing if the others failed.

During the voyage the weather was variable. A tumbling sea and a lively ship caused many of the philosophers some anguish, which it required all their philosophy to endure; but in fine weather instruments were produced, and there was a grand display of spectroscopes, prisms and crystals, Savart's, Nicol's, and tourmaline, every bright cloud and rainbow, whether from rain or spray, was immediately examined and polarized, even the light on Ushant, which appeared very bright after sunset, did not escape, but was subjected to observation.

Eventually the *Urgent* arrived off Cadiz on Monday evening, the 12th, and it may here be remarked for the benefit of nautical readers, that within the last two years a lighthouse has been built at Chipona, which is as conspicuous as that near Cadiz, and is liable to mislead sailors coming in from the N.W. The ship had to lay off for the night, and the next day was placed in quarantine by the Spanish health authorities, because she had not a bill of health. The necessary permission to land at last arrived, and the Cadiz party went on shore with their instruments.

We will now leave Captain Maclear to tell his own story.

"In the meanwhile Mr. Perry went off to San Fernando, to obtain from the observatory all the information possible about sites for observing. Nothing could exceed the kindness shewn by Senor Pujazon, Director of the San Fernando Observatory, and the Spanish astronomers, in their endeavours to render us every assistance. Nor were private individuals less kind in their offers, amongst others, Senor Matheu, a gentleman whose acquaintance we made that evening, and who placed at our disposal his vineyard near Santa Maria, and the house adjoining it, which place, out of many others offered to us, was eventually selected as being the most eligible. It is situated about four miles N.E. of Santa Maria, and nine and a half north of the observatory at San Fernando. The advantages it possessed were that it was only six miles south of the central line of totality, about seven miles from the American position near Xeres, and about six from Lord Lindsay's at Santa Louisa; thus the parties were well separated in case of the sun being partially obscured by passing clouds.

"Some little delay occurred in bringing up the instruments by reason of official doggedness on the part of the Chief of the Douane, but at length he was softened, and by the aid of some dreadfully jolting bullock carts, the instruments were eventually deposited safely at San Antonio, the name of the vineyard.

"Some days were spent in erecting the battery and exercising with it. Light clouds and dark clouds, sun and moon, were constantly

practised at with polariscopes and spectroscopes; and time was often taken to see how much we could do in two minutes. Time signals were also given every day from San Fernando, and Captain Toynbee, who had charge of the chronometers rated them, and ascertained carefully the position of our observatory, which was found to be lat. 36° 37′ 14″ N., and long. 6° 11′ 13″ W.

"On the 21st of December, the weather was remarkably fine. The wind blew from the N.E., and hardly a cloud was visible. Still to guard against bad weather on the morrow the party was separated, two observers with light instruments going to San Lucar, the extreme west point of the Spanish line of central totality, and twelve miles N.W. of San Antonio, while the artists for the corona were stationed one near Xeres, and another at Arcos, seventeen miles E.N.E. of us. The third remained at San Antonio, where were also two observers with the spectroscope, and two with the polariscope. The fine weather of the 21st December lasted but a day, and at two a.m. of the 22nd, the clouds and rain returned. It was an anxious morning, everyone was at his post, but thick clouds passed rapidly over the sun, and a strong breeze was rising from the westward. First contact was obscured, but about forty-eight seconds afterwards came a break, which shewed that the eclipse had commenced. A change then came from thick clouds to thin cirrus, which enabled us to observe the contact of the limb of the moon with some of the solar spots. As the crescent became thinner, the cusps were observed first to be drawn out a length of several minutes, and then blunted. Baily's beads were formed, and the corona burst forth more than twenty seconds before totality. The spectacle was very grand, though it must have been much diminished by the haze that was passing before the sun, the red prominences were numerous, but none very remarkable.

"The corona was evidently quadrilateral, but extending farthest in the direction of first contact, the brightest part extended to about one-eighth the sun's diameter, fading rapidly at one-fifth, but clearly visible at seven-eighths. Some observed two curved rays, but the general appearance was that of a diffuse light interrupted in four places distinctly, and in a fifth faintly, by dark intervals. The corona was white, and rendered faint by the clouds. The darkness was never sufficient to prevent sketching without the aid of a lamp. Venus alone was visible. Totality ended by the formation of Baily's beads, and the corona was visible to the naked eye fifteen or sixteen seconds after totality. The clouds obscuring the sun destroyed all chance of detecting any but atmospheric polarization; one observer, Mr. Ladd, remarked that polarization was

stronger on the corona than on either the moon's surface or the cloudy sky. The observations with the spectroscope were also greatly interfered with by the clouds, and the best instrument was rendered entirely useless. With a small direct vision spectroscope attached to a four inch achromatic, bright lines were observed about the position of Frauenhofer's well known lines: these were seen in the corona and also on the moon's disc, but much fainter. The observers at the other stations were not more fortunate than we were at San Antonio. At San Lucar the weather was about the same; at Xeres there was a break in the clouds which lasted more than half the totality, the remainder was obscured; at Arcos the view was described as very magnificent; a sketch was made there by Mr. Warington Smyth. Shortly after the totality the clouds thickened still more, and nothing further could be observed; the thermometer fell 3° Fahrenheit from the commencement to totality, and rose again 1·7° before the end of the eclipse, the barometer was falling rapidly all the time of the eclipse, and also afterwards at the rate of 0·04 in an hour. The wind was blowing fresh from W. by N., during totality it lulled but freshened afterwards to a gale, and about two hours afterwards, came on a very heavy storm of rain. We waited till the time of last contact, in the hopes of getting further observations; then set to work to take down, and pack up the instruments, this was performed much more quickly than the setting up. Our party now broke up to disperse themselves about the country and see as much as they could till the arrival of the *Urgent*, which was expected at Cadiz on the 28th. On the afternoon of the 29th, we found the *Urgent* had left Gibraltar that morning, and shortly after she made her appearance and anchored in the bay.

"The following day we embarked with our instruments, but the ship did not sail till the morning of the 31st, in order to allow her passengers to see the place, and give time for some of those who had started overland from Gibraltar to come in to Cadiz.

"The voyage home was not marked by any particular incident. We started with fine clear weather, a smooth sea and little wind, but after rounding Cape St. Vincent, we met a rough sea from the Atlantic. Near Finisterre a strong wind from N.E. sprang up, and lasted half way across the Bay of Biscay. After this we had smooth water and no wind, which enabled the ship to put on her best speed, and brought us in to Portsmouth on the morning of the 5th of January, 1871, after a short run of five days from Cadiz; this passed speedily, interested as we were in comparing notes and observations, discussing the probable results of the expedition, and

even those who had not been so fortunate as to obtain observations, had their adventures to relate, which were no less interesting and instructive.

"Soon after arrival we separated, with feelings of regret at terminating a companionship which had continued so long and so pleasantly, and though all the scientific results hoped for when we started may not have been obtained, we trust that some valuable additions to our knowledge have been made, and at all events we have the satisfaction of knowing, that we performed our parts to the best of our abilities, and did the most we could under adverse circumstances."

The Gibraltar party, under the direction of Captain Parsons, disembarked from the *Urgent* on the 14th December. The intervening time between that date and the 22nd was spent in experimenting and in making arrangements for successful observations. A portion of the party remained at Gibraltar, while the greater part proceeded to Estapona, about thirty miles N.E. from Gibraltar, on the central line of totality, as shewn on the map. This position offered the considerable advantage of thirteen seconds' longer duration of the total obscuration. Unfortunately, however, on the 22nd at Gibraltar the sky was quite overcast, and the entire phenomenon of totality was hidden from Captain Parsons and Mr. Talmage, who were posted on the Rock. Professor Newcomb, of the United States, was more successful; he was able to take several measurements which he required; he caught a glimpse of the corona, but not sufficient to enable him to make any use of it. The party at Estapona only saw the total phase about fifteen seconds, and then not clearly. One observation shewed that the corona was polarized, and another gentleman saw some bright lines in the spectroscope.

The Oran party, under the charge of Mr. Huggins, were still more unfortunate than the Gibraltar observers. The following extracts from a letter from Admiral Ommanney will explain the ill-luck of the party to which he was attached.

H.M.S. *Urgent*,
At Sea, 3rd January, 1871.

"You will be very sorry to find that our efforts have been unsuccessful, for on the eventful day, owing to stormy weather and a cloudy sky, the phenomenon of the totality was entirely obscured from our view. Sad to relate, no opportunity presented itself of obtaining any result. Westerly gales with squalls and rain set in

three days previous to the eclipse; and when the day arrived the weather was more unpromising than ever. As the time drew near the wind increased and the clouds rolled up from the west in heavier masses, we did not even get a sight of the first contact; I occasionally caught glimpses of the phases, the last observation I had was seeing about $\frac{8}{10}$ of the sun obscured by the moon; the amount of darkness during totality was not so intense as I was prepared for by former accounts, the sudden return of light was the most striking feature on the occasion. Our observatory was set up on the most approved position which could be selected, with the approval of the local authorities. The day previous to the eclipse our tent was thrown down in a squall, which upset the great equatorial and other telescopes; happily no injury was done, and every instrument was in perfect order for observation. Every preparation was made to ensure success. Our disappointment has been a most grievous one, it was a melancholy day for us all. We have been provided with a capital ship and every support from all Government authorities.

"ERAS. OMMANNEY."

We now have to refer to the Sicilian party, which, under the charge of Mr. Lockyer, proceeded overland to Naples, and then embarked in the *Psyche* to go on to Sicily. The unfortunate accident to that ship alluded to in our last number, however threw out their arrangements to a considerable extent, but with no little energy, and the assistance of the American party of observation, who were there, they eventually succeeded in putting things right and forming a fresh plan of operations. The party was distributed over four points of observation, viz.: Catania, Agosta, Mount Etna, and Syracuse. At Catania Mr. Lockyer, assisted by Mrs. Lockyer, was prepared to make observations which would no doubt have been of the highest value, but unluckily a dense cloud effectually hid the phenomenon from sight. On Etna, Professor Roscoe and his assistants experienced a fierce hailstorm which lasted some minutes, including the two precious minutes of totality. At Agosta and Syracuse, however, the weather was tolerably propitious, and observers there have recorded some remarkable observations. Professor Watson, from the United States, has examined the corona, and found it to appertain to the sun, extending about five minutes in height beyond the solar disc. This proves in a remarkable manner the accuracy of the calculations, for the instructions of the Organising Committee actually suggested the height of the corona to be about 5′ to 6′ in extent. The light

of the corona was also found to be strongly polarized. From a spectroscopic observation taken by Mr. Burton at Agosta, the most important results may be expected. In the spectrum he discovered the ordinary lines of the sun's atmosphere, generally known as the chromosphere, then the well-known hydrogen lines, and outside these another line (which may be called the corona line), shewing the existence of a substance lighter than hydrogen, and like nothing that we at present know of.

This then would appear to be the principal result of the expedition as far as we know at present. At Santa Louisa, near Cadiz, Lord Lindsay seems to have had a success in obtaining photographs and views of the phenomenon, but particulars have not yet reached us as to what the photographs and views indicate.

This evidence concerning the corona is alone worth all the money and trouble expended in sending out the little army of observers. The result obtained is a step forward, but only a step. Peering across the vast space between the earth and the sun, with all the latest appliances of this advanced age, our wise men of science have solved a long standing problem as to the existence of this luminous halo round the sun; but in so doing have been brought face to face with a subtle, rarefied substance, the constitution of which is to be the next matter for enquiry and determination, the next onward step in the progress of science,—one of many which for aught we know may lead ultimately *ad infinitum*.

We may also observe that if the results of this particular investigation had even been barren in other respects, yet the remarkable accuracy of the astronomical observations, the wonderful mechanical skill shewn in the construction and adjustment of instruments for observation, and the completeness of the general arrangements for surveying the phenomenon, would in themselves have been very gratifying results of the organization of the expedition.

We cannot conclude our paper without expressing our thanks to Admiral Ommanney, F.R.S., and Commander Maclear, R.N., who accompanied the expedition, for their very kind contributions on this subject, and we also have to thank J. R. Hind, Esq., F.R.S., etc., Superintendent of the Nautical Almanac, for permission to engrave the map of the path of the total phase in our frontispiece.

OUR FUTURE NELSONS.

About half a mile above the town of Dartmouth, well out in the stream and in one of the prettiest spots in England, lie all the year round two large men-of-war. One is a noble looking line-of-battle ship belonging to what we are now with regret compelled to call the old school; the other is also a line-of-battle ship, but there is little that is either noble or striking in her appearance, for indeed she is nothing more nor less than a hulk. The two vessels are connected to each other by means of a bridge, so that to all intents and purposes they are one ship. They, however, bear separate names, the hulk being H.M.S. *Hindostan*, and the noble liner H.M.S. *Britannia;* and it is on board these vessels, which are officially recognised under the latter name only, that our would-be Nelsons receive their initiation into the mysteries of life in the Naval Service. And that there are manifold mysteries in this service nobody can deny. Bad enough indeed, for a youngster to have to go to a new school on terra firma, where everything is novel and strange to him, but how much worse to have not only to leave his home, trust himself on board what perhaps he has never seen before—a ship—and then feel himself dependent for happiness on the forbearance —oh ye gods and little fishes!—of nearly two hundred midshipmen—aye, worse than midshipmen, naval cadets, who have not yet had the mischief taken out of them by salt water. All things though must have a beginning, and we fancy it must be decidedly pleasanter to make one's first essays in the seafaring line in Dartmouth Harbour than to plunge direct into the open sea of naval adventure as did Peter Simple, Midshipman Easy, and other heroes of renown. What used to happen to such celebrities as these everybody knows, what happens to those who are following in their footsteps to-day, everybody ought to know.

Let us take the case then of Master Thomas Brown, some time nominated to a cadetship in the Royal Navy, and who being, among other things, not under twelve nor above thirteen years of age, in good health and fit for the service, and successful in passing the required examination at Greenwich, has been appointed to H.M.S. *Britannia* for the purpose of instruction, or in other words, to be manufactured from the raw-state in which he then is, into that happy combination of nature and art—the British Midshipman. On a certain day then Master Brown, henceforward, by the bye, to

be known as *Mister* Brown, is duly escorted by what his future shipmates rather jocosely term his "fond parent" to Dartmouth, and eventually arrives on board the *Britannia*. Papa has very little to do on these occasions, in fact nothing, but to look round the ship. As soon as he has done this he may leave for the shore with the utmost despatch, and throw Tommy at once on his own resources. Left to himself then, one of the first discoveries made by Mr. Brown, and an astounding discovery it is too, is the simple fact that, although the Lords Commissioners of the Admiralty may have appointed him an officer in Her Majesty's Service by the style and title of "naval cadet," he is, and will continue to be for the remainder of the term, to those with whom he associates, only a "cheeky new." So thoroughly, indeed, is it impressed upon a youngster by his messmates that this is his proper designation, that once we believe when the Lords of the Admiralty were inspecting a ship, one of their Lordships asked a cadet what term he belonged to, and received the ingenuous reply, "Please sir, I'm only a cheeky new."

On a similar occasion, a diminutive cadet being asked how old he was, answered, "Thirteen, sir." "Dear me," said his Lordship, "you are very small for your age." "Yes, sir," was the simple rejoinder, "but I was smaller still when I joined the service." But this by the way.

As far as life itself is concerned on board the *Britannia*, the following is the ordinary programme for the day:—

In summer the cadets turn out at half-past six. In winter a quarter of an hour later; prayers and drill occupy the time till breakfast, which is taken at eight o'clock. Then follow studies and instruction in seamanship, etc., till twelve. Fifteen minutes after that hour, rather early in the day as is the custom on board ship, dinner is announced by a bugle. And here we must remark, that this dinner, like all the other meals served to Mr. Brown, is an excellent repast; indeed, if we understand our young friends aright, there is only one thing they have to complain of on the score of "grub" and that is that it really is "too good," and unfits them for the fare they will hereafter have to put up with when at sea in a midshipman's berth. The matter, however, is not one that calls for immediate reform, and we therefore do not commend it to the notice of their Lordships. After dinner study and seamanship are again had recourse to *pour passer le temps* until half-past three p.m., when every one, barring the defaulters, of whom more anon, land for recreation. This is to be had in the greatest abundance and variety. Bathing, boating, cricket, football, rackets, fives, skittles,

besides, we were going to say, other games too numerous to mention. We think the cadets have been singularly fortunate in the ground provided for their recreation, for it contains hill and dale, wood and water, field and fence, is clothed with the luxuriant vegetation peculiar to South Devon, and abounds with the prettiest views imaginable of the Dart, and the surrounding country.

A most delightful residence, it should be added, which is situated in one of the best suburbs of Dartmouth, is known as the Cadets' Hospital, and here it is that the sick (of whom there are, except in cases of epidemic, but few) are sent to be treated as if at home, their recovery being aided in no slight degree by the charming influences around.

And yet, in spite of all the natural advantages afforded by this situation for keeping our young Nelsons in a healthy state of mind and body, we are told to expect a change, and that "the formation of a College at Greenwich Hospital for the instruction of all ranks of naval officers, is one of those ideas that once started must be eventually fulfilled." Greenwich was the home of our tars when on their last legs, now it is to be the place where they will be taught to take their first steps. Times are changed. Times are changed indeed. Let us remain on the Dart, however, for the present.

At half-past six the rambling on shore ends, and the cadets return on board. At seven o'clock they have tea—meat meal No. 3. Then the studies are opened for voluntary work until nine o'clock, when all assemble for prayers. A little later, and our young friends are called upon to perform the gymnastic feat of turning into their hammocks. This they do with such marvellous dexterity and celerity, that they are out of sight in a twinkling. So ends the day in summer, the necessary alteration for the shortened time of daylight being made in winter.

The defaulters, to whom we referred just now as being debarred from the amusements on shore, must now have a moment's attention. There are people young and old who contrive to get into trouble in every possible situation; and some of these young people find their way occasionally on board the *Britannia*, though perhaps it is not such a bad place for them after all, for, to our mind, a great deal of genius is here displayed in the system of punishments awarded to those who err. In the first place, getting up very early in the morning is not pleasant to the vast majority of mankind, notwithstanding what a few enthusiastic early risers may say to the contrary. Well, a defaulter has to begin the day by getting up at five o'clock, that is in summer; then there is no end to the drill he has to go through,

and sailors as a rule detest soldiering. Then the defaulters are liable to be placed in a mess by themselves, where strict silence has to be kept during meals, and where at breakfast they are not allowed any "meat or butter," at dinner "no soup, beer, or second course," and at tea the "same as at breakfast," with "nothing afterwards" by way of supper.

But let us turn from these misguided mortals to that brighter side of cadet life, where steadiness and good conduct meet with their just reward. The discipline of the cadets, it must be known, is in some part maintained by themselves, for certain of their number having proved trustworthy are appointed respectively, captains and chief captains of cadets, and it thereupon becomes the duty of these latter to assist the officers in upholding the regulations and discipline of the ship. Besides the honour conferred by such posts, captains and chief captains enjoy certain small privileges, such as being allowed to sit up later at night, a more liberal allowance of pocket money, etc. But the privileges are nothing compared to the position; for dignity is a plant of rapid and powerful growth on board the *Britannia*, and its development is often the whole and sole aim of many a "most promising young officer." If only going on shore in the boats, for instance, the senior cadets may be seen wrapped in all the majesty of self importance reclining in the stern, while the juniors are, where of course they ought to be, "forward." If we remember aright, it was Peter Simple, who in ignorance of the naval etiquette which requires the senior officer to be the last to step in and the first to step out of a boat, stood respectfully aside when they were about to quit the ship, and said politely to the Admiral, "after you, sir." All that can be said for Peter Simple is, that he was never a "cheeky new," or he would have known better. But it is not merely in these little niceties of the profession that the naval cadets of the present day are instructed, for as far as an outsider can judge, they are thoroughly well taught in every other respect. And we feel that we are paying but a poor compliment both to the Admiralty and the officers of the *Britannia* themselves, when we say that the latter gentlemen have evidently been most carefully selected for the special duties they are called upon to perform in the work of training England's would-be Nelsons. Long may the youngsters, oldsters, and "cheeky news," be allowed to enjoy their present happy, healthy, manly life; and long too may they be kept out of Greenwich or any other Hospital.

MERCHANT SHIPPING LEGISLATION.

No. II.—ADMEASUREMENT OF TONNAGE.

THE EARL OF HARDWICKE: "I am quite sure that if there are any gentlemen in this room who are not seamen, who are visitors, and are not accustomed to the use of the term 'tonnage,' they will not know what it means; for to this moment I do not know what it means."

Transactions of the Institution of Naval Architects.

OLD TONNAGE LAWS.

So long ago as the year 1422 the shipment of sea coal from Newcastle afforded an opportunity for the then Parliament to try its hand at merchant shipping legislation. It is easy to understand that in the absence of any defined rule as to the measurement of ships, vexatious questions would arise. There probably arose in those early days questions between the supplier of coal and the shipper, the shipper and the carrier, the owner and the master, the port authorities and the shipowner, the crew and the owner and master, besides various questions between other parties—questions, perhaps, but little different in principle from those arising at the present day. It is probable that some one had been carrying too much or had received too little coal on board, or had been paying dues on less than his ship carried; or the carrying power of his ship may have been under-estimated, and over-tested, or the lord of the manor, or the harbour or port or dock authority may not have received a sufficient "groundage" or "poundage," or "harbourage" or "tonnage fee," etc., etc., for we find in the old measurement Acts such ugly things as "deceits," "new deceits," "new frauds," "deceits and abuses," called by their plain names, and sought to be remedied.

In the year 1422, being the ninth year of the reign of King Henry V., the enactment is recorded that "keels" that carry coals at Newcastle shall be measured and "marked." How they were measured, and how they were marked, are not known; but 226 years after, or in 1648 (*temp.* Charles I.), "deceits" were referred to, and commissioners were appointed with a view to admeasuring and marking "keels" and other boats used for the carriage of coals in the port of Newcastle, and all other places within the counties of Northumberland and Durham.

By the year 1694 (*temp.* William and Mary), in consequence of "divers new frauds, deceits, and abuses," the methods of measuring and marking were distinctly laid down by statute. This is

so important an enactment that it is well to have it word for word; bearing in mind, however, that it was not intended for general application to all British merchant ships, but only to "keels," etc., carrying coals in Northumberland and Durham. The 6th and 7th William and Mary enacted that "said admeasurement shall be by a dead weight of lead or iron, or otherwise, as shall seem meet to the said commissioners, allowing three-and-fifty hundredweight to every chaldron of coals," etc.; and the said commissioners were to "cause the said keels and boats so admeasured, to be marked and nailed on each side of the stem and stern and midships thereof," etc.; and "no such keel or boat shall be admeasured, marked, or nailed to carry more than ten such chaldrons at any one time."

This special system for ships carrying coals in Northumberland and Durham, was subsequently extended to ships used in carrying coals and loading at all other ports in Great Britain, for we find by 15 Geo. III., that all vessels used in loading coals at all other places in Great Britain were to be admeasured "by a dead weight of lead or iron, allowing twenty hundredweight Avoirdupoise to the ton, and marked and nailed as aforesaid, to denote what quantity of coals each will carry up to the mark so set thereon." Still, as applicable only to coal-laden ships, this law continued to be but limited in its application.

Concurrently with the above system for admeasuring and marking coal-laden ships, there existed another and different system for the admeasurement of ships carrying spirits. Owing to the prevalence and success of smuggling in little vessels, the Parliament enacted (6 Geo. I.) "that no spirits should be allowed to be imported in vessels of thirty tons burthen and under;" and "for the preventing disputes that may arise concerning the admeasurement of ships laden with brandy and other spirits," it was also enacted that the following admeasurement rule should be observed: "That is to say, take the length of the keel within board (so much as she treads on the ground), and the breadth within board by the midship beam from plank to plank, and half the breadth for the depth, then multiply the length by the breadth, and that product by the depth, and divide the whole by 94; the quotient will give the true contents of the tonnage."

There was no admeasurement law applicable to the whole British mercantile navy until the year 1773. In that year "disputes" thrust themselves on the attention of the Government. By the Act 13 Geo. III. cap. 74, "one certain rule for measurement purposes was settled and established for all cases."

It is unnecessary to give this rule verbatim, but its substance may be stated as follows: It adopted external measurements (not internal measurements, like the Spirit Vessels Act of 6 Geo. I.); the length, less three-fifths of the breadth, was multiplied by the breadth, and again by half the breadth, and the product was divided by 94; the quotient was the tonnage. Moorsom expresses it thus:—

$$\frac{(L - \frac{3}{5} B) \times B \times \frac{B}{2}}{94} = \text{Register Tonnage.}$$

This rule, even quite recently, used to be referred to constantly in advertisements and specifications; it was known as "O. M.," "Builders' Measurement," and the "Old Law." The evil of this "old law" will be comprehended in an instant. So long as the depth of a ship was half her breadth, the tonnage given by the "Old Law" was not far wrong; but every inch by which the depth exceeded half the breadth, gave the shipowner so much carrying power not measured in the tonnage, and therefore not subject to taxation. The result of the "Old Law" was, as Moorsom points out, that of the vessels built under it:—

"The length was about three and a half times the breadth;"

"The depth about three quarters of the breadth;" and

"The form or shape of the body approximating to that of an oblong box."

So long as merchant ships sailed in convoys, or were under some sort of protection from ships of war, these dimensions were no very great evil. The ships were all bad alike, all slow, all "old bruisers;" they kept well together, and they carried large cargoes, and as the tonnage on which they paid dues was often only about three-fifths of their real tonnage, the owners were satisfied. As soon, however, as the long war was over, and our merchant ships had no longer to sail in convoys, the ugly old cheats we had built under the "Old Law" were found to be too slow and otherwise utterly unfit and unable to compete with merchant ships of other nations.

This "old law" stands out as a warning and a terrible example to our legislators of the present day. It shows how vicious must ever be any tonnage law that, by its unequal operation as between ship and ship, will encourage the undue development of any portion of the hull of a ship, for it will offer a premium for exceptional arrangements or exaggerated forms. A law that by improperly exempting from admeasurement any part of a ship that ought to be measured, or by improperly including in ad-

measurement any part of a ship that ought not to be measured, will tend to the building of monstrosities or uncomfortable and unsafe ships. The present law is intended to avoid all extremes of this nature, for while it makes express provision for the exemption of spaces under erections on deck used solely for the protection of deck passengers and approved for that purpose by the Board of Trade, it does not intend to encourage the erection of dangerous top hamper, or the building of ships with any undue excess of either depth, width, or length. Whether this wise intention of the present law has been really followed in practice by the shipbuilder and shipowner, is another and a special point which will be specially referred to further on. In the meantime, we must continue our consideration of former rules.

Those who admire simple laws for their simplicity alone, cannot fail to admire the "Old Law." It was simplicity itself. It only entailed three measurements, and one subtraction, one division, and two multiplication sums. But against its simplicity, we must place its vices. It is enough for us to rejoice that it has gone the way of a good deal of equally bad legislation. Had it remained as law to this time, the building and sailing of our present ocean clippers and steamers would have been difficult, if not impossible.

In the year 1820 the Board of Trade, or, as it was then known, "the Office of the Lords of the Committee of His Majesty's Most Honourable Privy Council appointed for the consideration of all matters relating to trade and foreign plantations," called on the Admiralty to appoint a commission to consider the question of tonnage. This commission reported in May, 1821. Its report was not attended to, and is now only worth remark on account of one fact, viz., "that its members would have been desirous of removing all doubt on the subject by proposing the admeasurement of that portion of the ship which is included between the light and heavy water lines; but this method has been considered as liable to insuperable objections on account of the *impossibility of ascertaining the positions of these lines* in a satisfactory manner." It may be some consolation to those who advocate the marking of load lines on ships at the present day, to know that others besides the present authorities have found such a course liable to "insuperable objections."

The "Old Law" is as remarkable for its vitality as its vices, for it continued to remain in force for years after it was condemned. In 1833 it was more seriously attacked, this time with better success. A second commission, appointed by the Admiralty at the request of the Board of Trade, reported that "internal capacity

will be the fairest standard of measurement, including all those parts of a vessel which, being under cover of permanent decks, are available for stowage," and "that a rule of such general application should depend on the smallest number of measurements necessary to give the figure of the hull, and that it should afford results sufficiently exact for the required purpose by an easy arithmetical process." Rules on these principles became law, and were known as the "New Law" (5 and 6 Will. IV. cap. 56; and 8 and 9 Vict. cap. 89).

This "New Law" was remarkable for two things—first, that the principle on which it was founded is sound and in every respect good; and secondly, that the manner in which that principle was practically applied was essentially defective. The principle is that the "measurements shall extend to the whole internal capacity, and that there shall be included in the measurements *all those parts of a vessel which, being under cover of permanent decks, are available for stowage.*" This principle was then first established, and is the principle on which the present law (Merchant Shipping Act, 1854) is based.

The "New Law" corrected many vices of the Old Law, but owing to the very few measurements it prescribed, it was open to evasions. Certain parts of the ship not affected by measurements continued to be unduly enlarged, and fresh inconsistencies arose. Builders and others, notwithstanding the repeal of the "Old Law," always adverted to it and acted on it; and what is curious, the Government never adopted the "New Law" at all, but took its contracts under the repealed Old Law, or "O. M.," or "B. M." The "New Law" being the only legal measurement, and the Admiralty and other departments, and builders and owners nevertheless using the "Old Law," an awkward state of things came into existence; and in 1849 the shipowners themselves took the matter up, and, at their request, the Board of Trade once more called on the Admiralty, and the Admiralty once again appointed a commission of inquiry.

This third commission rejected the sound principle of the internal measurement of the former commission, and recommended a return to external measurements, and proposed a scheme that was alike notorious for its ingenuity and utter impracticability. It met with much opposition, and its insufficiency was exposed by Mr. Moorsom. It would have given no direct measure of the internal capacity of a ship, and would not have been equally applicable to wooden and iron ships, of the latter of which there were then but comparatively few, although sanguine people looked for an increase in them.

But out of this commission, and in an unexpected manner, came good. Notwithstanding the valuable principle established by the second commission, there had not been down to this time any practical method by which the internal capacity of ships could be measured fairly as between ship and ship. One Act of Parliament upset the principles of another; one commission approved of one thing, and one of another. What between the conflicting principles laid down by successive Acts of Parliament, the conflicting and impracticable recommendations of commissions, though much had been done in the way of deliberating, and reporting, and recommending, and confusing, nothing had been effected of any real good, or likely to hit the vices of the "Old" and the "New" Laws.

Moorsom's Law.

In this state of things Mr. Moorsom, who had acted as secretary to the last commission, thought of one of those formulæ invented by Stirling, for measuring spaces "bounded by irregular curves." It was founded on Sir Isaac Newton's discovery of a theorem—a discovery, as Moorsom says, which the immortal author himself considered amongst his happiest inventions, and by which "the areas of all curvilinear spaces, not geometrically quadrible, nor discoverable by any known rules of direct investigation, are so closely approximated as to amount to geometrical exactness." Mr. Moorsom's plan was adopted by the Board of Trade, became the law of the British Empire in 1854, and is now accepted by nearly all the maritime states of the world.

The internal capacity of a ship is, under Mr. Moorsom's rule, intended to be accurately ascertained in cubic feet, and divided by one hundred. Each one hundred cubic feet of space in a ship is then called a ton. It might be called anything, but the term "Ton Register" was an old term and a well-known term, and for want of another and perhaps a better name, "Ton" remains, as applied to the capacity of ships, although it does not continue to mean weight but means space. In the following remarks from this point forwards whenever a "Ton" is spoken of, a "Roomage Ton" is meant of one hundred cubic feet.

It may be well here to remind the reader that there are two tonnages on the official records of most ships, viz.,—(1) The "Gross Tonnage" or the tonnage (or roomage) of the whole hull intended to include the hold between decks, the deck-houses, forecastle, poop, engine rooms, etc.; and (2), the "Register" tonnage, or the tonnage or "roomage" under cover, available for goods, or passengers, or stores, after deducting the space occupied or

allowed for engines, coals, and crew spaces. It will save much confusion hereafter if we call the gross tonnage, the gross register tonnage, and the register tonnage, the net register tonnage;—and as both these tonnages are entered in the register, this nomenclature will not only be convenient but accurate.

The rule at present in force for ascertaining the gross register tonnage is in substance as follows:—

1. Decks are numbered from below, No. 1 being the lowest deck, No. 2 the next above No. 1, and so on upwards.

2. The "tonnage deck" is the upper deck in ships with less than three decks.

3. The tonnage deck is the second deck from below in all other ships.

4. The spar deck is the third deck from below.

5. The "gross" register tonnage is intended to be the cubical contents of the entire hull of the ship, *i.e.*, of all space below the uppermost deck, plus all permanent closed-in spaces on the upper side of that deck available for cargo or stores, or for the accommodation of passengers or the berthing of the crew.

6. If there is no deck at all, then the whole of the contents of the ship are measured from the upper edge of the upper strake downwards.

Having arrived thus far, having gleaned a few facts as to the history of tonnage, and having ascertained exactly what the present rule is, we must now take up one or two points of special interest. These points all relate to exemptions or deductions allowed to or claimed by the shipowner from the gross register tonnage. These deductions are more or less opposed to the principles of the tonnage rule, they are unequal as between ship and ship; and the further they are carried the less valuable do the results of that rule become, if register tonnage is intended to be and to remain an index of the actual carrying capacity of a ship.

Spar Decks and Spaces on Deck.

All ships pay dock dues, light dues, and other dues on their net register tonnage as stated in the certificate of registry: it follows therefore that the interest of the shipowner is to keep his recorded net register tonnage at as low a figure as possible.

If a shipowner A can so arrange his ship as to give him an available tonnage (roomage) of 2000 tons under cover; and if at the same time he can get that ship registered as of 1000 tons, it follows that he A will save, or rather evade, half the legitimate dock dues, light dues, canal dues, and other charges on tonnage.

A will increase his profits accordingly. It also follows that if another shipowner B has a ship with tonnage (roomage) of 2000 tons, and does not arrange his ship to register 1000 tons, but 2000 tons, that he B will be paying twice as much as A, and will really be paying for A, because as the income derived from the dues on ships is made up of a charge on the whole shipping, it follows that what one ship does not pay other ships must make up.

The gross register tonnage of a ship is meant to be an exact index of her capacity; and the number indicating that tonnage ought to be a safe figure for assessment. The number representing the net register tonnage is a varying number, and is but too often in steam ships no index of internal capacity. This being so, two questions naturally arise; first, why are tonnage dues now charged on the net register tonnage and not on the gross register tonnage, and secondly, although tonnage dues are now charged on the net register, whether it would not be desirable, and if desirable, whether it is not possible to alter the method of calculating them, and to shift them from the net to the gross register. These two questions open up a large subject, it will be impossible in a short paper like the present to do more than glance at them, which we will do further on. We must first however enquire how the present law of measurement for gross tonnage operates, and how it may be evaded. The principle clearly laid down by the second commission is that internal capacity will be the fairest standard of measurement, including all those parts of a vessel which being under cover of permanent decks are available for stowage. This principle was affirmed by the Third Commission or Committee in the following words:—"That inasmuch as the poops, forecastle, and other covered-in spaces are directly or indirectly a source of earnings for cargo or passengers, those spaces should be all measured." This principle is moreover embodied in the Merchant Shipping Act of 1854, which provides, that besides the spaces below the upper deck, "any permanent closed-in space on the upper deck available for cargo or stores, or for berthing or accommodation of passengers or crew, shall be measured and added to the gross tonnage." A space on the upper deck permanently covered over or closed in may be available for cargo or stores, and yet not be suited or fitted up for the accommodation of passengers, or the berthing of the crew, or it may suit one sort of cargo and not another, and if it is permanently closed in, and if the closing in is sufficient to render it available for cargo or stores (and if cargo or stores are carried there it is available), then under the Act it is required to be included in the measurement. But whilst it is

clear that closed-in spaces on the upper deck "available for cargo and stores, etc.," are to be included in admeasurement, it is equally clear that uncovered or unenclosed spaces, even if available for cargo, stores, or passengers, are not to be included. In other words, the law has never contemplated including in the tonnage admeasurement, space occupied by cargoes carried on deck, and not under cover of any permanent erection.

Let us look at fig. 1, a vessel without any deck. Under the Merchant Shipping Act of 1854, the whole of the shaded part is included. Let us look at fig. 2, a vessel with only one deck, there the shaded part is all that is included in the tonnage, but an owner may also carry as much cargo on the deck as he pleases. If he does he earns more freight but he pays no more tonnage dues for his ship than if the deck cargo were not there. Seeing then that the space under the deck is the only space measured for tonnage, it follows that by putting on a deck, he has decreased the tonnage of his ship; it also follows that if he places that deck still lower he will pay still less dues. For example, take an exaggerated case, as in fig. 3, where the deck is shewn low down, the shaded part only will represent the tonnage on which dues would be paid. He then puts shelter for deck passengers over this deck as in a saloon steamer, and still claims to pay tonnage only on the shaded part.

It is open to question whether the whole internal space up to the upper strake ought not in figs. 2 and 3, to be included in the tonnage. The omission from tonnage would not however be of much importance, if ships of this class with one deck were but few and small, and were confined to river navigation, but so soon as erections and coverings are put over the one deck, and if by evasions the space under those erections and coverings are exempted from tonnage in sea-going ships, as will be explained further on (Fig. 12 and 13), a great evil may result.

Let us now take an ordinary ship with two decks and deck-houses, as shewn in fig. 4. Here the shaded parts represent the parts available for the stowage of cargo or stores or the accommodation of passengers, etc. The whole of these parts are intended to be, and ought to be, included in the gross register tonnage. We will now take a three decked ship with deck-houses on the middle of the upper deck and cabins at its sides, as in large ocean going ships, see fig. 5.

The third deck is here referred to in the Act as the spar deck, and on the spar deck are cabins, saloons, etc. The parts shaded are the parts that are intended to be included in tonnage admeasurement. Now the ship sketched in fig. 5, is it is stated an unsafe form of ship,

for if a sea is shipped on the upper deck it washes about between the various deck-houses, gets into the engine-room and into the hold, and altogether jeopardizes the safety of the ship. The owner therefore puts yet another deck on and covers up the passages, thus making his ship a four decked ship. He also puts houses on the fourth deck, puts a light rail round it, works his ship on that deck, and carries his boats, steam winches, etc., there. This ship is then represented by fig. 6. The whole of the shaded part is under the letter of the rules liable to be measured for tonnage. The arrangements below the fourth deck in fig. 6 remain precisely as they are in fig. 5, only they are covered over. Now as regards dues the difference between the ships shewn figs. 5 and 6 is this—that in fig. 5, the uncovered unshaded spaces between the deck-houses are not liable to tonnage measurement because they are uncovered, whereas no sooner are the passages covered over than they become liable to measurement, although it is urged that being passages which must of necessity be kept clear of cargo, goods, and stores, they are not, in the words of the Commissioners of tonnage, spaces which being under cover are available for stowage.

Here then we have a broad question to consider, viz., ought the legislature by express enactment to provide that certain spaces under the uppermost deck of a ship shall be exempt from tonnage admeasurement? and if so, what conditions should be attached to the exemption? In considering this question we must always bear in mind that the present law does not provide for any such exemptions. Exemptions have in some cases been claimed notwithstanding the present law. These cases will be referred to further on, but we must now for the moment discuss the question on the understanding that whatever may be done in future the law does not as it at present stands contemplate any exemption of the sort. It will be found on referring to a Blue book on tonnage, published by the authority of the Board of Trade, that in 1866 this subject had been urged on their notice. In that book (page 57) will be found the draft of a clause circulated by the Board of Trade for consideration. There is nothing in the book to shew that the Board of Trade either approved of or dissented from the proposal. All they did appears to have been to print the clause and circulate it for consideration. The draft clause was as follows:—

"In cases in which a third deck, commonly called a spar or covering deck, is provided to connect the upper sides of the poop, forecastle, deck-houses, and saloons or cabins with each other, and with the sides of the ship, such spaces under the spar or covering deck as are not included in the poop, forecastle, deck-houses,

saloons, or cabins, shall not be included in the registered tonnage of the ship, provided always that one of the surveyors appointed under the fourth part of the Merchant Shipping Act 1854, shall have previously given a certificate under his hand to the effect that the spaces under such spar or covering deck, and not included in the poop, forecastle, deck-houses, saloons, or cabins, are not fitted up for the use of the passengers or crew of the ship, and are not intended to be applied towards the earning of freight, but are solely covered in for the purposes of securing the safety of the ship and cargo, and the passengers and her crew."

The remarks of the Secretary to the Board of Trade on this draft clause were also circulated, and were as follows:—

"It has been represented to the Board of Trade that steam ships fitted with a poop, a forecastle, and houses on deck, are far more unsafe than ships fitted with a spar or covering deck, because the covering deck connecting the tops of these erections with each other and with the sides of the vessel prevents seas breaking in between and doing damage to the erections on deck, and thereby endangering the safety of the vessel. This has been strongly urged on the Board of Trade by the Institution of Civil Engineers for Scotland, and the Scottish Ship Building Association, by whom it has been represented that these covering decks, whilst they are added solely for the safety of the passengers and crew and the security of the ship, and whilst they do not add a single ton to the capability of the ship for earning freight, are included in the measurement for tonnage, and increase the various dues paid upon tonnage to the extent sometimes of £1,200 a year."

Some shipowners objected to the proposed exemption in the strongest possible manner. Amongst the best objectors were the firm of Messrs. George Smith and Sons, sailing shipowners, of Glasgow. Their letter is printed in extenso in the Blue book referred to above, the substance of their objections is as follows:

1. "An allowance from spar or covering decks, as affording shelter to steerage passengers, and at the same time making the ship more seaworthy, seems only reasonable, were it not that it is likely to be open to abuse unless very carefully guarded; much more carefully we think than the clause embodied in the paper now before us.

2. "Many owners we have no doubt would give full effect to the spirit of the Act as there laid down.

3. "But you are aware that there are shipowners who could not be depended upon, and who would be very unscrupulous in taking advantage of it, and who would require sharp watching.

4. "Our main difficulty, however, in regard to the clause, arises from the fact that it virtually gives the large ship a very decided advantage over the small. It is only large ships that can with propriety carry spar decks, and why they should have such advantage now offered them we are at a loss to determine.

5. "If allowance is to be made for spar decks, we fear much you will find small-sized vessels wholly unfitted for carrying them will be constructed to take advantage of the proposed law, and that such an arrangement may tend to make a class of ships be built that will prove unseaworthy from top hamper.

6. "Besides any party putting a spar deck on his ship will only do so if he thinks it will be profitable to him. The shelter thus afforded commanding an increase of passengers on the clear deck he will thus acquire affording greatly improved means to the officers for seeing that the men are at their duty, it is but right therefore that such space should be paid for.

7. "We would respectfully suggest that in the event of Her Majesty's Government judging it expedient to make any allowance, that allowance should not exceed one half of measurement of the spar deck space. This would keep the owners in check.

8. "Our decided opinion is that the entire closed-in space of every ship, whether under or above deck, should be included in the measurement, from which in all ships, large or small, the space required for the accommodation of the crew should be deducted, and that such space should in no case be occupied either with cargo or passengers under a severe penalty."

As far back as 1850 Mr. Allan Gilmour, who was probably of all shipowners the one at that time best competent to speak on the subject, wrote as follows, viz.,—"I quite agree in the justice and propriety of measuring all poops, roundhouses, forecastles, and every covered-in space on deck that may be used either directly or indirectly by the crew, or made a source of earnings for cargo or passengers."

To Messrs. Smith's objections, Messrs. James and Alex. Allan replied, as steam shipowners:

1. "In the first part of their letter Messrs. Smith state that all sailing vessels are obliged to pay for their full measurement, except where arrangements are made for the crew on deck, and they cannot see on what principle the entire space occupied in steamers for cargo and passengers should not be included in the registered tonnage and dues paid for it, the same as in sailing ships. We answer, neither can we; but they are mistaken if they think that under the proposed change any cargo or passenger space in steamers will be exempt from measure.

2. "At present spar-decked steamers like our *Peruvian* not only have all their cargo and passenger space measured, but they have added thereto 600 to 700 tons *which is neither cargo nor passenger space*, but altogether unproductive; and in altering the law as proposed spar-deck steamers will simply be placed on the same footing as sailing ships.

3. "Messrs. Smith add what seems to us to destroy the force of their objection, 'any party putting a spar deck on his ship will only do so if he thinks it will be profitable.' As owners both of sailing ships and steamers we are satisfied that no shipowner will place a spar deck on his vessel unless it be to increase the safety of the ship, cargo, and passengers; and as the limited portion of such deck space as will be exempt from measure under the new law will not be available for cargo or passengers, the exemption from measure being strictly confined to those spaces which in sailing ships that have no spar deck are exempt, there could be no possible advantage gained in the matter of measurement by placing a spar deck on a ship that had not one. The spaces being free of measurement when uncovered would only be free, and nothing more when covered; covering, therefore, by a spar deck offers no benefit in regard to measurement, and no one would seek to place a spar deck on a vessel merely to take advantage of a law which exempted from measure a portion of ship already exempt."

Above are the pros and cons of the case as it was left in 1866. It must be gone into *de novo* when the new Bill is discussed in Parliament. If, as Messrs. Allan observe, the covering in of space on an upper deck does not in any way add to the freight earning powers of the ship, and if the exempting of space under an upper deck will not lead to the building of unsafe ships, and will not operate unfairly as between ship and ship, and if a practical scheme can be adopted to carry this into effect, then there can be no doubt that Messrs. Allan have reason with them in asking for exemption; but it will be exceedingly difficult to determine without inspecting every ship in which exemption is claimed whether the space can or cannot be used for earning freight, and, if the space cannot be so used on an outward voyage with passengers, whether it can be so used on the homeward voyage when cargo alone is carried. These are difficult points, but they are not insuperable, and it will rest with the shipowners to submit some equitable and workable plan to Parliament if they now wish the exemption to be legalized. The writer of these remarks hopes the shipowner may be able to do this. Every one must agree cordially with Messrs. Smith when they say, "make the law right and then allow each shipowner to construct

his ships in conformity therewith, and as best suited for the intended voyage."

We now have to glance at a very curious state of things as regards covered-in spaces, for whilst discussion has been going on as to whether certain spaces under cover on deck or under an upper deck should or should not be exempted, and if so on what conditions and under what circumstances, and notwithstanding the fact that the present law does not provide for any such exemptions,—these exemptions, and to a large extent, have actually been claimed. This state of things has probably come about as follows: The tonnage rule of the present Act provides, as we have seen, that "if there be any permanent closed in space on the upper deck available for cargo or stores, or for the berthing or accommodation of passengers or crews," the tonnage of such space shall be added to the tonnage of the ship. And if there is a "spar deck," or any decks above the spar deck, the spaces between them and the "tonnage deck" shall be ascertained and added. Now it is easy to understand that in some special cases an upper deck may be so covered by houses and other erections, that it is really difficult to say whether the tops of the houses and other erections and the coverings of the passages between them do not form an additional deck, and this difficulty is further increased if the coverings put on the tops of the houses and other erections should happen to present an even and nearly continuous surface sufficient to admit of the ship being worked, and the boats, winches, etc., being carried there.

Let us try and make this clear, see fig. 7. The second deck from below is the tonnage deck, on it is a poop aft with a rail round the top, amidships is a large permanent erection with a rail round the top of it. The bulwarks on the tonnage deck are not shewn in the figures. The space under the midship erection is open right fore and aft, but the bulwarks are carried up from the tonnage deck, and effectually and permanently close in the sides of the space. Forward is a large topgallant forecastle also with a rail round it. Although the tops of these deck houses communicate with each other by narrow gangways, and although being railed round they afford space on which certain operations connected with the navigation of the ship are carried on, still there is no doubt that a ship like that shewn in fig. 7, is not a spar-decked ship, but a ship having closed-in spaces on the upper deck. The roof is available for passengers, the topgallant forecastle is available for stores and for crew, and the space under the central erection is available for stores or for some sort of cargo. Still, so long as it is open at the

ends it is claimed as not liable to measurement. The parts shaded are the only parts that the shipowner generally admits are liable to be included in the gross tonnage measurement of such a ship.

Suppose now, that the permanent erection amidships is extended fore and aft, as shewn in fig. 8, though still being open at the ends and closed at the sides, the ship begins to assume the character of a spar-decked ship; still, however, the space under this long erection between the poop and forecastle ought not it is urged to be added to the tonnage of the ship. But, as pointed out above, if cargo and stores are carried under it, it really comes within the letter and spirit of the Act as a "permanent closed-in space available for cargo or stores." Now, let the permanent covering be extended a little further, as in fig. 9, in fact, let it join the poop aft, but not join the forecastle forward, let the fore end still remain open, the sides being carried up and the top railed round, and we have, if not a spar-decked ship, a very near approach to it—still the owner urges that the unshaded part, even if used for cargo, ought not to be measured, because, he says, it is not a "closed-in" space. But let us take an example, and see how far such an argument is good.

Let us suppose that a deck cargo of sheep has been carried on an open deck, and that the ship has taken in so much water over the top sides that many of them have been drowned. Now, as the carrier of cattle and sheep is generally only paid for what he lands alive, and as he may be, and probably is under certain circumstances, held to be liable for the value of any that may be drowned on his decks, it follows that it is to his direct interest to prevent the death of any of his cargo of cattle or sheep. In a recent case, several sheep were drowned when carried as deck cargo, the owner thereupon covered the whole of his ship from poop to forecastle with a permanent covering, leaving at one end an opening of a few feet and making the necessary provision for drainage, etc. Without plenty of ventilation the sheep would be suffocated. This opening as left at the end assists in ventilation, so necessary in the case of a cargo of cattle carried under cover. It also furnishes means of egress and ingress, and the covering provides an extra deck on which the crew can move about when the deck below it is covered with sheep. The erection is permanent, the space under it may not be specially closed in to enable the ship to carry tea, meal, flour, etc., but it is sufficiently enclosed, and is specially closed in and adapted by ventilation, drainage, and otherwise to suit the carriage of another cargo, viz., cattle or sheep. Is not then the space under this permanent covering a "permanent closed-in space on the upper deck available for stores or cargo?" Undoubtedly it

is; and not only does it happen to be available, but it is constructed expressly for the purpose. On what grounds then can exemption be claimed for it? We have only to go a step further, and extend the central structure or erection so as to join the poop and forecastle, and we get really a spar-decked ship. Now, if the top of the deck is railed round from stem to stern,—if the boats, anchors, chains, steam winches, are carried on the upper side of the uppermost deck, and if deck-houses are put on the upper side of it, it is difficult to understand why the upper deck is not a deck as much as any other deck on the ship—but the owner says it is not, and claims that the space is not to be measured, see fig. 10. To exempt the space below such a continuous permanent deck from measurement, as in fig. 10, some shipowners have for some time past had two openings left in some parts of it. These openings are generally wholly or partially battened down after the ship is measured, and the whole deck becomes absolutely continuous, and the space under it becomes available, and is, if not always, at any rate in most cases, used for carrying cargo or stores. The holes, the shipowner urges, make the deck not continuous, and so convert it into something that is neither a deck nor a closed-in space on a deck within the meaning of the Act; but the Act contains no definition of the word deck, and it is not consistent with common sense that two small openings in a permanent and continuous deck, such as those shown by square black dots on fig. 11, should operate more effectively than the ordinary hatchways in rendering the upper deck less a deck. Still, somehow the hatchways have not done so, and the little holes have been thought to do so; and the space between the upper deck and the deck below, although generally available for cargo, is claimed as not liable to be included in the tonnage of the ship.

In a case coming within the writer's knowledge the whole of the 'tween deck of a ship, fore and aft, has escaped tonnage admeasurement, on account of an opening in the fore part of the deck, and this space was equal in tonnage to the tonnage of several coasting sailing vessels. If the space, or any of it, between any two decks of a ship is to be exempted from measurement the exemption ought to be based on some sort of principle, and granted on intelligible and reasonable grounds. Such an important concession as this ought never be granted on such a miserable subterfuge as the temporary opening in a deck. It would be difficult, if space between the two upper decks of a ship be exempted, to say that space between two lower decks shall not also be exempted. It will in fact, if it is ever commenced, be difficult to say where this exempting process is to stop. If it is to be extended to ships with only one

deck, then large openings in that one deck would prevent the ship from having any tonnage at all.

We will now look at these exemptions as affecting safety. There cannot be a doubt that a good freeboard is an element of safety, nor can there be any doubt that a continuous covering does conduce to the safety of a ship when put over such a ship as that figured in fig. 5. But if a good free-board is an element of safety we must not forget that the reverse or top hamper is an element of danger, and if by any encouragement of spar or covering decks, the Government were to encourage top hamper, great evils would result. For example take figs. 12 and 13. If, in such a case as is there shewn, the owner could get the unshaded part exempted from measurement and use it for cargo, using at the same time the upper surface of the upper deck for cargo; and if he could build such a ship expressly to avoid or evade measurement, and bring in large profits,—then the law under which he could do so would be vicious in the extreme, and would have the diametrically opposite effect of that intended by advocates for exemption; and it must not be forgotten that in some trades locomotive engines and other heavy weights and cumbrous articles, are carried on the uppermost deck more frequently than in the hold.

Deck Cargoes.

The next point for consideration relates to cargoes carried on the exposed surface of an upper deck. In the following remarks the words "deck cargo" are intended to apply only to such cargoes, and not also to cargoes carried on deck under cover of any permanent shelter or erection.

The law as it at present stands does not prohibit the carrying of deck cargo. A ship may therefore, so far as the statute law is concerned, carry any part of her cargo on deck on any voyage at any time of the year; and the space occupied by deck cargo is not measured, and is therefore not included in the tonnage on which dues are paid.

There are some persons who advise that the carriage of deck cargoes should be prohibited by law, and who believe that deck cargoes have contributed to the loss of many steamships trading from the east coast. It may possibly be so, but there is no absolute proof of it. All we know for certain is that no steamers trading between England and Ireland have been lost from this cause for very many years, and it would certainly be unfair to punish the owners of steamers hailing from the western coast on account of the losses of steamers hailing from the east

coast, even if it were proved that the latter were lost from overloading or by deck cargoes.

Whether it is or is not safe to carry deck cargoes in some cases, is not a question on which we now propose to touch. Nor do we now propose to enter into the question whether the very great loss of steamships sailing from the east coasts of Great Britain is or is not due to excessive deck cargoes or overloading, or whether that loss may or may not be traceable to a peculiar build of ship encouraged by exemptions from measurement of covered-in spaces and spaces under upper decks.

These questions may fairly come under consideration when looking into the question of "safety and prevention of accidents"; all we propose now to consider is the question of deck cargoes as affecting tonnage admeasurement.

A ship such as that figured in fig. 1, is measured to the top of the upper strake; she therefore pays dues, if she pays at all, on her whole contents. A glance at fig. 2 will show that if a ship, say a timber ship, carries a cargo of timber, and is filled up to the top of the bulwarks, as she invariably is, the hull up to the top of the bulwarks earns freight. This being the case, it is not at first sight easy to understand why the contents occupied by the deck cargo should not be included in admeasurement, but they are not. There would be no difficulty in measuring the space occupied by deck cargo in the case of timber, or of cotton, or of hay and straw carried on deck in large masses; but if the deck cargo were not timber, or cotton, or hay, or straw, and if it were a miscellaneous cargo, and a partial and varying cargo, there would be great difficulty in measuring it. If the deck cargo were included in the case of a timber ship, it might add 20 per cent. to the tonnage of the ship; but if the deck cargo of a straw barge were included, it would add from 150 to 200 per cent. to her tonnage for a comparatively worthless cargo.

There are cargoes, especially on short voyage ships, that cannot be carried below deck when other articles are carried. For instance, cheese, and tea, and flour could not all be carried together in a small hold. Paraffin, tar, and turpentine cannot be put into the same hold with, say, tea, flour, fruit and vegetables, chickens, sheep, and pigs. Locomotive engines, boilers, tanks, and long iron rods cannot always be put into a hold in some trades, and must be carried on deck, and in the case of ships making frequent calls during a voyage trade would be altogether stopped by prohibiting the carriage of deck cargo.

As an illustration, the voyages made by some of the Scotch

coasters may be taken. The vessel leaves Glasgow with, say, the following things: — Potatoes, flour, oats, wheat in bags, bacon, cheese, pigs, a steam boiler or two, several casks of paraffin, a piano, tables, chairs, looking-glasses, bedsteads, beds, wardrobes, pots, pans, kettles, and various household utensils; a horse or two, a carriage, a few carts, a threshing machine with engine and boiler, some ploughs, hurdles, long iron rods, boiler plates, a boat, some sails, ropes, chains, fishing gear, etc., etc.—in fact, a miscellaneous collection of articles required by a population partly agricultural, partly seafaring, and partly manufacturing.

To say that none of these things shall be carried on deck would be the height of absurdity, and would prevent their being carried at all. We will suppose that the ship starts with her cargo stowed as usual, some in the hold, some on deck, and some on the bridge. She arrives at Greenock, where she discharges something and takes in something else; from Greenock she goes to one of the out-of-the-way places in the inner Hebrides, here she discharges, say, some of her eatables and some of the agricultural implements and livestock, and takes on board some salt fish, some periwinkles and some sheep, fowls, and ducks. She goes to a neighbouring island, discharges some furniture, leaves the sheep and some potatoes, etc., and takes on board some more fish, some more periwinkles in bags, and a cow or two. She then makes another call, and goes through a similar process, leaving and taking things at each place, and varying her cargo each time; and she does not do this once only, but twelve or fourteen or twenty times, for she makes a journey from Glasgow round the inner and outer Hebrides, and the coast of Sutherland and Caithness to Thurso and Wick, and back on the round again to Glasgow. If she is not to carry anything on deck, then she must have a separate place in the hold for separate classes of articles. She could not carry sheep and cattle in the same hold with eatables, nor with tar, paraffin, etc.; nor could she carry some large things below without being rendered unseaworthy by excessively large hatchways.

These steamers do the chief part of the carrying between island and island, and between places on the mainland and the islands. A flock of sheep has to be taken from one island to another, a stack of salt fish from an island to a mainland port, and all these things have to be done while the ship has cargo on board for other places further on. It would be folly to expect her to turn her cargo out of her hold in order to put the interim cargo there; and yet, unless she were to do so, she must make use of her deck. Seeing, then, that it is utterly impossible to prohibit the carriage of deck cargo

without stopping trade altogether (and the Scotch boats referred to are only instances on a small scale of the practical impossibility of prohibiting deck cargoes on a larger scale), then the question arises, as the cargoes must be permitted, ought not the uncovered space they occupy to be measured in the tonnage.

To this question the answer is that if the space occupied is to be measured, then, in such a varying trade as this, a measuring officer must always be on board to take the measurements, and the game would not be worth the candle, and the necessary interference would be exceedingly vexatious. The only other way to do it is to measure all ships to the top of the bulwarks or upper strake. This would be a direct departure from the principle of Moorsom's rule for decked ships, although it would perhaps be a logical way of settling the question; but the effect would be that owners would take away the bulwarks and substitute a netting and a rail, or make the bulwarks so low that the direct effect would be to render the ship absolutely unsafe. So long as deck cargoes are permitted, and that they must be permitted is certain, it appears to be difficult to attempt to interfere with them at all. This being so, the shipowner then asks, "If I am not to be charged dues on that part of my ship occupied by deck cargo, why should I be charged when I put a covering over it that does not add to the capacity of my ship." The answer would appear to be this, viz.: "If you put the shelter on solely for the protection of passengers carried as deck cargo, the Board of Trade will, and do, exempt the space under it from measurement, as in the case of the Irish mail-boats; but if you put it on to shelter other deck cargo, you do so of your own choice and because it suits your trade. It enables you to carry cargo on deck without loss, and helps you to charge better freight, or to insure more regular employment; and further, the cargo, when under cover of some permanent erection, is not deck cargo. If, under all circumstances, you decide not to put a covering on, you need not; but if you do put it on, you must weigh the facts and put it on with your eyes open. One thing is certain, that you will not put it on if it does not suit you, and you will put it on if it does." A reference, however, to the case already mentioned, as to cargoes of sheep carried on deck and under cover, will show that the non-measuring of and charging for space on the upper side of an exposed deck is quite consistent with the measuring of and charging for space under shelter of a permanent erection on that deck. Messrs. Smith, of Glasgow, say, as regards these exemptions under covering decks—the words are the words of a firm of shipowners, not the words of the writer of this paper—"There are

TO ILLUSTRATE PAPER ON TONNAGE ADMEASUREMENT.

Fig. 1.

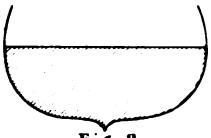

Fig. 2.

Fig. 3.

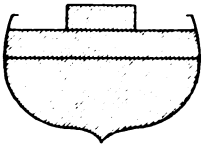

Fig. 4.

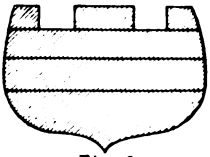

Fig. 5.

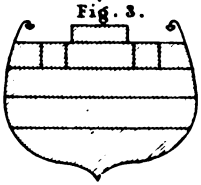

Fig. 6.

Fig. 7.

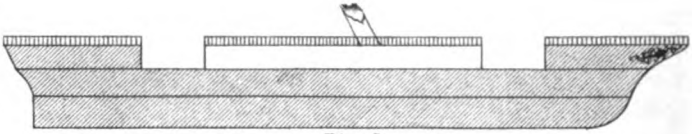

Fig. 8.

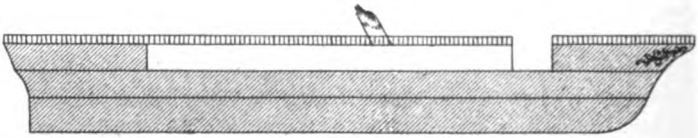

Fig. 9.

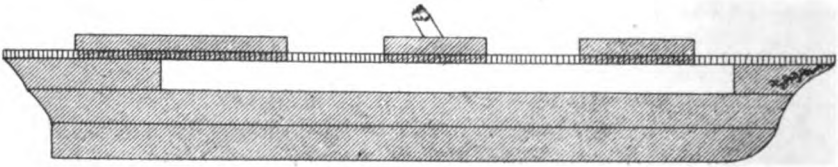

Fig. 10.

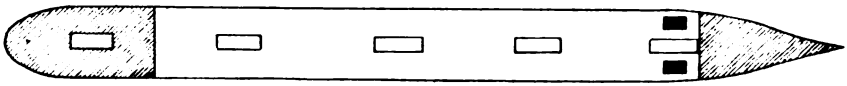

Fig. 11.

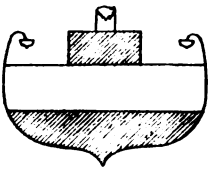

Fig. 12.

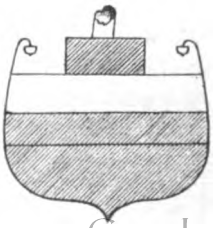

Fig. 13.

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shipowners who could not be depended upon, and who would be very unscrupulous of taking advantage of it, and who would require sharp watching;" and as regards putting on a covering deck, they say, "the shipowner will only do so if he thinks it profitable to him;" and Mr. Allan Gilmour, shipowner, of Glasgow, in speaking of allowances made to the tonnage of steamers, has said, "*I am fully persuaded that no steamboat owner, or steamboat company, however powerful, can give one good or honest reason in justification of the deduction.*"

Crew Spaces.

"A forecastle occupied by seamen is a place not fit to keep a dog in. It is so constructed that the sea can find its way in through the hawse holes, or through the sides, or through the decks, and distribute itself over the floor and trickle over and saturate the bedding; it is constantly filthy from dirt and vermin. No adequate ventilation is provided,—it receives insufferable stenches from the bilge water, the cargo, and the privies and urinals,—it sometimes contains men who are suffering from loathsome and contagious complaints; what little clear room it contains is taken up by ship's stores, and yet the crew are expected to live in it, to be cheerful, to be fit for work, and to be healthy, whatever may be the climate, whatever may be the weather."

This is the substance of complaints frequently made in past years by seamen and by philanthropic gentlemen on their behalf.

The above words may or may not convey a correct impression of the sleeping quarters of seamen then found in our merchant ships. Let us hope that the persons complaining gave expression to their feelings a little too strongly. In some of our large ships, especially in steam ships owned by careful and sensible owners, the accommodation of the seaman is good and his wants are attended to; but that the accommodation for seamen even if originally good is often now allowed to become bad and dirty and unwholesome, that frequently it suffers from the presence of dirt and the absence of light and ventilation, and that the health of the seamen suffers in consequence are facts that cannot be denied.

Under the old state of things ships' crews were generally berthed below deck in merchant ships, somewhere down forwards. If it be possible to find a place on board ship more unhealthy than another in which to berth a seaman, that place must be somewhere under hatches, where he can get but little fresh air, no light, and plenty of bad odours and vermin. Such a place is described by Marryatt and other writers, as a "mess" place in His

Majesty's ships, such a place was the forecastle of our old merchant ships. In the year 1854, the legislature, looking on this state of things as too bad, tried how they could bring Jack's bed-room into the fresh air, and to perch him in a topgallant forecastle. He had suffered for want of the two great essentials—air and light; that should be remedied at any rate. By the Merchant Shipping Act 1854, the space occupied by seamen was declared to be exempt from tonnage admeasurement if it were situated on the upper deck. If it were down below it would continue to be measured and pay tonnage dues. After the exemption was granted for seamen's berths in topgallant forecastles and deck-houses, the construction of these places on deck became more frequent: but as an exemption had now been granted in favour of sleeping accommodation in one part of the ship, the owner soon began to ask why it should not be also granted if good accommodation were provided elsewhere; say, below amidships, forward, aft, anywhere, so long as it is good accommodation. Why, asked the shipowner, should he be compelled to build deck-houses and topgallant forecastles. It will never do, he urged, for the Government to encourage the erection of these places on deck. Besides it was now found that topgallant forecastles had their disadvantages. If they were favourably situated for light and air, they were unfavourably situated for seas and rain and other things. By 1866 they had come to be represented as "damp, cold, unhealthy places on deck, where the men were cold and wet, and got cold, cramps, and rheumatism."

In 1867, the Duke of Richmond, then president of the Board of Trade, conceded the point, and exempted crew space from tonnage wherever it might be situated, provided certain conditions were complied with.

It would in the absence of special circumstances be obviously impolitic for the Government to interfere as regards the number of hands to be employed to do a certain amount of work. It would not do for the Government to decide by a hard and fast law, how many young ladies shall always be employed to make a score of dresses, or how many coalheavers shall be employed to unload a coal barge, or how many sailors shall be employed to navigate a ship. The number of hands to be employed in navigating a merchant ship, how many of them shall be officers, how many engineers, how many A.Bs., how many O.S., how many stokers, and how many boys, may vary according to service, and must be known best to those interested in the venture. This being so, the legislature while endeavouring to ensure that the hands who are engaged shall have proper accommodation, leave entirely to the

owners on the one side, and the men on the other, the power and the right of deciding between themselves how many or how few hands shall be employed.

The owner has to determine the number of hands all told for which he wishes to have certified accommodation: he has then to provide that accommodation. To be certified and passed, it must be such as to afford:—

(*a*) Seventy-two cubic feet, and twelve superficial feet of floor space for each seaman.

(*b*) The place must be available for proper accommodation. Securely constructed, properly lighted and ventilated, properly protected from weather and sea, and properly shut off from effluvia from cargo or bilge water.

(*c*) Certain necessary conveniences must be provided.

(*d*) The place must be inspected once, viz., before the deduction is allowed.

(*e*) It must be kept free from goods or stores. The crew are to get a shilling a day for *each* day it is not kept free.

The owner and master are subject to penalties for non-compliance with the law as regards space, etc., whether deduction is or is not claimed for the tonnage.

Here then is a reasonable state of things. The seaman is to be provided with decent accommodation, which is to be kept free from ship's stores, and the owner is to have a consideration for providing that accommodation. This consideration is to take the form of a reduction of the tonnage on which dues are paid.

If this arrangement works fairly on the whole, then it is a good arrangement. If on the other hand it gives a shipowner an excessive allowance for which the seaman gets no advantage or no adequate consideration, it is a bad arrangement and requires reconsideration.

Let us with the aid of a few printed returns, etc., see how i works.

The following is a list of steam ships of various classes:—

Steam Ships.	Net Register. Tons.	Tons deducted for Crew Space.	Number of Crew carried.	Excess allowed at one ton per man.
A	80	24	7	17
B	273	24	17	7
C	391	41	29	12
D	627	57	22	35
E	662	91	49	42
F	1746	184	92	92
G	1110	58	27	31
				x 2

SAILING SHIPS.

Ships.	Net Register. Tons.	Tons deducted for Crew Space.	Number of Crew carried.	Excess allowed at one ton per man.
H	1444	68	34	34
I	999	57	26	31
K	880	49	26	23
L	699	41	18	23
M	393	32	14	18
N	132	23	6	17

The Act requires that each man shall have seventy-two cubic feet of space, but the above table is computed on an allowance of one hundred cubic feet per man, that is to say, on a ton of roomage for each man, and it will be seen that even at that increased rate of roomage per man, the allowance is in some cases granted for three hundred per cent. above the number of the crew actually carried. If the legislature intended to grant an allowance only for the number of men composing the crew actually carried (and there is no reason to suppose that a greater allowance was intended to be made), then the Act has allowed more than its framers and promoters intended. It is not likely that the shipowner suffers the space not actually used by the crew to lie idle, and if he uses it for stores or cargo, he uses space for which he pays no tonnage dues. In the old act a limitation was fixed by which the deductions for crew space could not exceed one-twentieth of the tonnage of the ship. That limitation was removed by the Act of 1867, and it is a question whether it or some other limitation ought not to be restored. If the shipowner is to be allowed, free of taxation, roomage sufficient for the wants of the crew he actually carries,—and there do not appear to be any good reasons why he should be allowed for more, —then the law which gives him more should be altered. If for instance the register tonnage on which dues are paid were reduced at the rate of 0·75 ton for each man appearing in the articles for the voyage, the shipowner would obtain the deduction due to him, with a margin of three per cent. in addition to the roomage required by law to be allowed for each seaman.

Old Rules for Engine-Room Allowance.

The first law for the admeasurement of steam vessels was passed in 1819; by it the "length of the engine-room was deducted from the length of the keel in measuring the length of the vessel for tonnage." This in effect gave the whole section of the ship occupied by the engines as an allowance for propelling power. But

although the contents of the whole section of the ship from the keel to the upper deck were thus allowed to be deducted on account of engine room, it does not follow that the engines and boilers occupied the whole of that section. If the ship were a three decked ship, the machinery and boilers might be below the second deck—still the whole section of the ship from the keel to the upper deck was deducted for engine-room; or the engines and boilers might be in two or more separate compartments with passages between them—still the capacity of the whole section of the ship as far as the machinery and boilers extended was deducted from her tonnage.

There was, however, a provision in this enactment, rendering it illegal "to stow or place any goods (fuel for the voyage excepted) in the engine-room." From the first, therefore, a steam ship has been allowed, on account of boilers and machinery, a greater space than they have occupied. This excess of allowance must have been granted with some definite object—and although that object is not stated, there is little doubt that it was to afford space for the carriage of "fuel for the voyage."

The next law, 4 Geo. IV. cap. 61, contained the same rule, but omitted the prohibition as to carrying goods in the engine-room. In 1834, the second Commission reported, "That in registering the tonnage of steam vessels *instead of deducting the length of the engine-room (according to the present mode) an allowance shall be made of one-fourth of the whole tonnage*," and they added, that "*some legislative provision might now be made to enable His Majesty's Government to alter the proportion of that allowance hereafter.*"

The next law, viz., the "New Law," enacted that "the tonnage due to the cubical contents of the engine-room shall be deducted from the total tonnage." The cubical contents of engine-room were to be ascertained in the following manner:—"Measure the inside length of the engine-room, in feet and decimals, from the foremost to the aftermost bulkhead, then multiply the said length by the depth of the ship or vessel at the midship division, as aforesaid, and the product by the inside breadth at the same division at two-fifths of the depth from the deck, taken as aforesaid, and divide the last product by 92·4, and the quotient shall be deemed the tonnage due to the cubical contents of the engine-room." Thus, still giving the whole section of the ship from extreme bulkhead to extreme bulkhead, but ascertaining the contents more accurately than under the old law. If the engines and boilers were placed close together the section would be small, but if they were spread along the ship in separate compartments, with passages between them, the section would still under the "new law" be excessive. Under that law a

steamer whose gross measurement was 1695 tons, was registered as of 444 tons, so great were the exemptions allowed.

The report of the third Commission, ordered to be printed by the House of Commons, 15th February, 1850, stated that "with regard to the admeasurement of vessels propelled by steam, the whole tonnage shall be calculated as for sailing vessels; and that, in order to carry out the principle which has been laid down of preserving as nearly as possible the aggregate amount of tonnage under the old law, unaltered, it is necessary as heretofore to deduct from the above the tonnage due to the engine-room, measured externally. *But the committee beg to suggest that the deduction of the engine-room is an advantage given to steam over sailing vessels, and is a question which merits consideration by the proper authorities*, although the committee do not deem it within their province to enter upon."

It is clear from this that the gentlemen who reported in 1850, only continued the deduction because it had been previously allowed, and thought it wrong in principle, and certainly did not think that it ought to be increased.

In 1851, Mr. Allan Gilmour, whose name is deservedly honoured wherever it is mentioned in connection with ships and shipping, wrote as follows:—"I am convinced none but those interested in steamers, or those who do not comprehend the bearing of the subject, will oppose the views I set forth in this matter, and I am certain that even they can give no good, sound, or just reasons in support of the allowance. I believe all they can, or do urge, or plead for, is 'Do not ask for a reduction on the allowance of tonnage to steamers, but as an equivalent to sailing ships, insist on an allowance or deduction on their tonnage.' I am entirely opposed to any such arrangements. I maintain that the tonnage of every vessel entering the ports of the United Kingdom, whether British or Foreign, shall be ascertained by one and the same rule, without any allowance whatever, this deduction therefore on the tonnage of steamers ought not to be made any longer. I am fully persuaded no steamboat owner or steamboat company, however powerful, can give one good or honest reason in justification of the deduction. I may safely assert then, that on all hands it is admitted that if an allowance is to be made to steamers, an allowance should also be made to sailing vessels; but I maintain it is decidedly wrong to make any allowance to either, and more especially in the way that is now done to steamers, because I believe that advantage is most improperly used, and an opening is made for fraud and imposition —as there is reason to believe that, in many cases, if not very generally, more space is taken in steamers than is necessary for the

engine-room, and as this additional space allowed is the most buoyant part of the vessel, and where the greatest power of floatation or displacement is, the advantage thereby gained by steamers generally, is also greatly increased."

Mr. Gilmour spoke truly if he spoke plainly, and his words, as the words of a shipowner conversant with the subject, are words of gold.

Mr. Moorsom evidently had no liking for allowing any deduction on account of propelling power in steam ships; but looking to the fact, that such a deduction had always been allowed—also looking to the fact, that it was thought desirable at the time he proposed his scheme that the relative tonnages of steam and sailing ships then existing on the records should not be violently disturbed, he gave a rule in his scheme as follows: "the tonnage due to the cubical contents of the engine-room is to be determined in the following manner, that is to say, measure the inside length of the engine-room between the foremost and aftermost bulkheads, or limits of its length, and having found the transverse areas at these limits to the height of upper deck, and also the area at the middle point between them, in the same manner as hereinbefore described for ascertaining the other areas, then to the sum of the two end areas add four times the middle one, and multiply the whole sum by one-third of the common interval between them, which is the cubical content; and which divided by one hundred gives the tonnage due to the engine-room." The scheme would have given a whole section, and would not have cured any of the vices of the previous law, and it was set aside. It appears from a memorandum issued by the Board of Trade, in November, 1863, that the Bill of 1854, as first introduced, proposed to give a deduction of three-tenths of the gross tonnage to paddle steamers, and of two-tenths to screws, with the proviso that where the horse-power was very small, the actual contents of the engine-room should be measured accurately. To this, two objections were made; first, that nominal horse-power was a matter too vague and inaccurate to form the basis of legislation; and secondly, that the allowance proposed would be unfair between steamer and steamer, and would improperly reduce the reduction for ships of large power. These objections prevailed, and in the amended Bill the rule was altered, but the principle of per-centage was retained in a modified shape.

Present Engine-room Deductions.

The aspect of the question as regards engine-room allowance was fully discussed in 1867, and has not changed since. The writer of

the present paper cannot, therefore, do better than refer the reader to the Blue book on tonnage, issued by the Board of Trade in that year.* In that book he will find that the question is fully discussed. As, however, this paper would be incomplete if it did not contain a statement of the principles of the rules now in force as contained in the Merchant Shipping Act 1854, and the objections to them, these points are given concisely below, viz.:—

1. The actual cubic capacity of the space necessary for, and solely occupied by machinery and boilers is measured.

2. Coal bunkers are not measured.

3. Where the measured space is in paddle-steamers between twenty and thirty per cent. of the gross tonnage, then thirty-seven per cent. of the gross tonnage is deducted.

4. Where the measured space is in paddle-steamers below twenty or above thirty per cent., then fifty per cent. more than the space due to the measurement is deducted.

5. Where the measured space in screw steamers is between thirteen and twenty per cent. of the gross tonnage, then thirty-two per cent. of the gross tonnage is deducted.

6. Where the measured space in screw steamers is below thirteen per cent. or above twenty per cent. of the gross tonnage, then seventy-five per cent. more than the space due to the measurement is deducted.

A few examples will explain the very unsatisfactory working of these rules.

PADDLE STEAMERS.

For every One Hundred Gross Register Tons.

Gross Register Tonnage.	Engine-room as measured.	Allowance.	Net Register Tonnage.
Tons.	Tons.	Tons.	Tons.
100	10	10 + 5 = 15	85
100	20	20 + 10 = 30	70
100	21	37 per cent.	63
100	29	37 per cent.	63
100	30	30 + 15 = 45	55
100	67	67 + 33·5 = 100·5	Nil.
		SCREW STEAMERS.	
100	10	10 + 7·5 = 17·5	83·5
100	13	13 + 9·75 = 22·75	78·25
100	14	32 per cent.	68
100	19	32 per cent.	68
100	20	20 + 15 = 35	65
100	58	58 + 43·5 = 101·5	Nil.

* J. D. Potter, 31, Poultry. One Shilling. Printed by H.M. Stationery Office.

So that under this absurd system of per-centages, a paddle steamer with an engine-room of twenty-one tons will get an allowance of seven per cent. more than a similar steamer with an engine-room of twenty tons, and a screw steamer with an engine-room of fourteen tons will get an allowance of ten and a quarter per cent. more than a similar steamer with an engine-room of thirteen tons. One ton either way makes this large difference in the amount of deduction. And steamers may really have no tonnage at all on which dues can be charged, indeed, this is actually the case in some steam ships at the present moment. Not only is this so, but with the excessive deductions for crew spaces, as already explained, several steamers have not only no tonnage, but have absolutely a minus quantity.

We have only now to take a few actual cases of deductions from all sources, viz., crew spaces, engine-room allowance, and exemptions of covered-in spaces, to shew how unequal and unfair is the result of these deductions. The ships laden with cotton passing through the Suez Canal afford a fair illustration. About five and one-third bales go to a ton. It follows from a perusal of the following short list, either that the sailing ships and some steam ships are overcharged by Messrs. De Lesseps and Co. and other Dock and Harbour Owners, or that Messrs. De Lesseps and Co. are not properly paid by the owners of the other ships.

SUEZ CANAL.

	Gross Register Tonnage.	Deductions.	Net Register Tonnage.	Bales on Board.	Bales in excess in Steamers' favour.
Steamer A	2815	1006	1809	14.440	
If A were a sailing ship of	—	—	1809	she could carry 9,648	4,792
Steamer B	1407	450	957	9,073	
If B were a sailing ship of	—	—	957	she could carry 5,104	3,969
Steamer D	1417	353	1064	5,639	
If D were a sailing ship of	—	—	1064	she could carry 5,600	39
Steamer E	1355	389	966	4,648	
If E were a sailing ship of	—	—	966	she could carry 5,152	being an excess in favour of sailing ships of 504

The steamers A and B are both fitted with a covered space available for cargo between the poop and forecastle, but not included in the gross measurement. It will be seen how exceedingly unfair is the operation of the present law, not only as between some

steam ships and some sailing ships, but as between steam ship and steam ship, for whilst some steamers carry an enormous excess over sailing ships of like net register tonnage, the law so operates that other steamers cannot carry so much as a sailing ship of the like net register tonnage.

General Conclusions.

Gross Register Tonnage.—We have seen that the rule for calculating this tonnage is sound in principle, but that it has been injuriously departed from in the case of closed-in spaces available for cargo, on or under the upper deck. We have also seen that exemption from measurement has led to anomalies, inconvenience, and gross injustice.

Net Register Tonnage.—We have seen that this may be nil.

Spar Decks.—We have seen that spaces under these decks which are required by law to be measured are sometimes exempted. We have also seen that they may be an element of safety in some cases, and an element of danger in other cases.

Closed-in Spaces on Deck.—The same remarks apply.

Crew Spaces.—If the deduction is to be continued, some limitation is necessary, without interfering with the manning of ships.

Engine-room Spaces.—We have seen how absurd, unequal, and unjust is the present law; some rule must be adopted, doing away with the deduction altogether, or, if this is impossible, limiting it to, say, fifty per cent. of the gross tonnage. If the deduction is to be continued, the actual measurement of the space set apart for and used by engines, boilers, *and coals* would, subject to the limitation of fifty per cent., probably be the fairest rule. It would give an allowance for the actual space used for the propelling power; and if Mr. Gilmour's view is right, that no deduction should be given at all, how difficult must the steamboat owner find it to give a good or honest reason why the deduction should exceed the space actually used and required for propelling purposes, or to give any reason, good or bad, why it should absorb the whole, or nearly the whole, of the tonnage on which dues and rates are paid.

Tonnage Dues.—As regards shifting these dues from the net to the gross register, such a plan is impossible so long as the dock authorities adhere to their present unfair plan of charging as much for a day or two as for a month, a plan that bears unduly on vessels making frequent visits or remaining but a short time. It has been admitted on all hands that the gross register tonnage, with an allowance for time, would give the fairest standard for charging

tonnage dues or wharfage and dock rates. Some permissive powers enabling dock authorities to do this, might perhaps be introduced into the new bill with advantage. The Act of 1863 contained a clause to the effect that "any body corporate or persons having power to levy tonnage rates on ships, may, with the consent of the Board of Trade, levy such tonnage rates upon the registered tonnage of the ships as determined by the rules for the measurement of tonnage for the time being in force under the principal Act, notwithstanding that the local Act or Acts under which such rates are levied provides for levying the same upon some different system of tonnage measurement."

It is possible that if the new bill were to contain a permissive clause applicable to gross tonnage somewhat similar, something might be eventually effected. But the whole question is beset with difficulties and with points that cannot as yet be specifically dealt with by Parliament. The writer of these remarks merely throws out the above hint for consideration, in hopes that it may lead to some suggestion of value.

There is, perhaps, another way of settling the difficulty. If the steam shipping interest will not now give up the deduction allowed for engine-room space, but should again succeed in obtaining legislative authority for its continuance, then the sailing ship interest will probably, on what they believe to be equitable grounds, also claim further exemptions. Seeing that it will, in such a state of things, be impossible to return to the true tonnage—viz., the gross register tonnage of steam ships as the tonnage for taxation, the question then is, might not the true tonnage both for sailing and steam ships be reduced alike. What is really wanted to bring about an equitable arrangement, is to bring the tonnage of all ships back from the net to the whole true tonnage, so that the whole tonnage of each ship shall afford a safe figure for taxation; but if it be impossible to revert to the whole true tonnage in the case of steam ships, why should not the desired result be attained by a reduction in the true tonnage of sailing ships equal in amount to the reduction from the true tonnage of steam ships. The tonnage of all ships would then be alike; but instead of all being alike as regards gross register or true tonnage, they would all be alike as regards another tonnage, viz., the net register tonnage, which would be half the true tonnage in all cases.

Suppose, for example, that if every steam ship be hereafter allowed fifty per cent. as a deduction from her tonnage, then let every sailing ship have a deduction of a like amount. Dock owners would alter their rates quickly, and would probably find an equit-

able method for alteration. As regards returns of trade and navigation, seeing that the two tonnages of a ship and all the deductions are recorded in the official registers, the tonnage returns and other statistics could be so arranged, whenever necessary, that they could continue to give information on the present basis, and without making any violent change, and without shewing any decrease in the actual tonnage of the Empire. In making any change all interests would have to be considered, so that the holders of shares in the docks, the owners of steam ships, and the owners of sailing ships may participate equitably.

International Tonnage.—Most maritime countries and states have adopted the principles of the British system of measurements for gross tonnage, but they hesitate to adopt a system of net register tonnage open to such inconsistencies and capable of inflicting such injustice as the British system. In settling the future system of British net register tonnage, the question must be treated on broad and intelligible grounds, in the hope that a system may be devised that can and will be adopted by the whole world.

Administration of Tonnage Laws.—This paper would scarcely be complete, without some reference to existing arrangements for the survey of ships for tonnage and other purposes. At the present moment, no less than three departments have a staff of surveyors of ships. The Emigration Board for Passenger Ships; The Board of Trade for Passenger Steam ships, and for the crew spaces, and lights, and fog-signals of all ships; and the Board of Customs for the measurement previous to registry of all ships. The shipowner reasonably complains of this state of things, for it sometimes happens that the action of the Board of Trade and Board of Customs, as regards tonnage, unexpectedly brings the ship into a different class as regards the Emigration Board, and requires the engagement of extra hands for whom, the shipowner says, he can find no employment. The nomenclature of decks should also be re-settled. All sorts of new names have come into existence, such as awning decks, weather decks, promenade decks, hurricane decks, covering decks, etc., often used without distinction for the same thing. There are also the main deck, the spar deck, the tonnage deck, and the upper and lower passenger decks, and sometimes the orlop deck. The present tonnage law only calls two decks by name, viz., the tonnage deck, and the spar deck. And as under the tonnage law the spar deck is always the third deck from below, it sometimes has a deck and deck-houses above it. It is not always as is supposed, the uppermost deck. Perhaps the best way would be to number all decks from below upwards, as in the present tonnage

law, and to call them the first, second, third, fourth, and fifth decks, as the case may be. These are easy matters, and will no doubt be satisfactorily settled when the New Bill is under discussion in Parliament. We now dismiss the subject of tonnage admeasurement, in the hope that what we have written may be of some use at the present moment. In our next number we propose to consider the question of manning. In doing so we propose to touch on the compulsory apprenticeship system, the register ticket, foreign seamen in British ships, and the training of boys before entry into the merchant service.

THE ELECTRIC LIGHT AT SOUTER POINT.

We are glad to welcome the appearance of another brilliant luminary on our seaboard. Souter Point, on the coast of Durham, between the entrances of the rivers Wear and Tyne, has recently had a bright star bound on its brow. It will be remembered by many of our readers that a few years back considerable agitation was caused by vague reports of misleading lights at Whitburn, and numerous wrecks in the immediate neighbourhood of Souter Point. A strict investigation, however, dispelled the misleading lights theory, corroborated the reports as to the numerous wrecks, and brought to public notice sundry lurking dangers, which threatened mariners on that particular part of the coast, and which were, no doubt, the real causes of the many disasters which had occurred.

The Trinity House, therefore, after much consideration as to the best mode of indicating these dangers to navigators, determined to place a lighthouse on Souter Point, and to discontinue that at Tynemouth Castle. But we understand that some of our north country friends were not altogether favourable to the disestablishment of their old friend the Castle Yard Light, which had done good service for more than 240 years, and that, in deference to this feeling, the original intention of the Trinity House has not been carried out, the Tynemouth light being merely altered from a white revolving to a red revolving light.

And we must confess our satisfaction at this arrangement, not only for the sake of "Auld Lang Syne," but because navigation is so much benefited by it. While the old light is kept up to guide

vessels into the Tyne, and so continues to be very useful as a local light, the new light at Souter stands out as a bold coast light, marking with well devised arrangements the dangers of Whitburn Steel, Mill Rock, Hendon Rock, and the White Stones, and stretching its light far out on to the sea hailing the passing ships, and cheering many a seaman's heart with its bright beams.

But after all, it may be said, the establishment of a new lighthouse on the coast is nothing so very wonderful. All lighthouses are very much alike, and probably the same pretty or fine sayings have been said over and over again, as each light was lit up for the first time. Whether this be so or not, we do not care to enquire; certainly, if we took every thing as a matter of course and never gave expression to feelings of admiration and gratitude on occasions when such feelings might be appropriate, it would seem that we were insensible of the many blessings of life, and consequently were hardly worthy of them. But with this question we have no concern just now. We have an unusually good reason for devoting some space to an account of this new light, because it is a remarkable instance of the recent development of what may almost claim a place among the sciences and the ologies,—we allude to lighthouse science, or pharology as it is called.

This new light is a revolving electric white light of great brilliancy —the second, and we hope not the last, electric light which has been shewn permanently from an English lighthouse—; the flashes are of five seconds duration, with dark intervals of twenty-five seconds. There is no waxing and waning as in many revolving lights, simply a wonderfully vivid flash lasting five seconds, and then "pitchy night" follows for twenty-five seconds. The apparatus to produce this effect consists of a portion of a dioptric apparatus of the third order for fixed lights. Around this is rotated an octagonal drum of glass, consisting of panels of eight vertical lenses; by these lenses the divergent and continuous sheet of light from the fixed portion of the apparatus is gathered up so as to form distinct beams, which successively reach the observer as the panels pass in succession before him. It is a remarkable piece of optical skill, requiring the utmost care, both in mathematical calculation and manufacture; the perfection in both are due to the scientific attainments of Mr. James Chance, of Birmingham. The electricity for the production of the spark is generated by one of Professor Holmes' magneto-electric machines, worked by a steam engine of six and a half indicated horse-power. The magneto-electric machine contains fifty-six compound permanent steel magnets, and is driven at a speed of four hundred revolutions per minute. The steam engine,

boiler, and magneto-electric machine are all duplicated in case of accident or want of repair to any part. In thick weather both magneto-electric machines will be worked, thus doubling the power of the current of electricity, and consequently the intensity of light. As a further precaution against accident, an oil lamp is placed in position, and is always in readiness to take the place of the electric light at any moment.

A very remarkable feature is a lower light shewn from the same tower twenty-two feet below the upper light. This light is, in truth, the back or waste light of the electric spark above. The back rays are gathered up and condensed into a small cylindrical beam of great intensity, which by reflection is sent down the centre of the tower twenty-two feet; it is there received on to another reflector composed of reflecting prisms and sent out on to the sea. This is the ingenious plan of Mr. Douglass, the Trinity House Engineer, to whom we are indebted for much of our present information. We understand that this reflected light may be just as easily sent upwards, or indeed in any other direction. Perhaps the time may come when many of our ordinary lights will be just as unsubstantial as this lower light at Souter Point, and though many lights may be visible, yet it will be most difficult to find the real flame or spark.

Tender hearted or nervous housekeepers, we have a small piece of information for you. At this lower window the outside glass can be cleaned in all states of the weather without opening the window or the keeper going outside. It is strange, but nevertheless true. Thinking upon the many men servants and maid servants who daily imperil their precious lives, who run the dreadful risk of impalement on area railings, we earnestly hope this arrangement may soon become generally known and adopted.

Another very noteworthy feature is the fog-horn blown by steam power. It is a monster horn, and is so arranged that in foggy weather its sound may be sent to all parts of the adjacent sea. It is arranged that the number of blasts be two per minute, the duration of each blast being five seconds, with an interval of twenty-five seconds, corresponding with the flashes and intervals of the light. It is rather a joke to think that the light and the horn are to be made to work harmoniously (save the mark!); we are to have "sweetness and light" together—the music of the horn and electric flashes. Joking aside, however, this is really something in the way of introducing distinctive sound signals, which are sadly wanted on our foggy shores.

We think now we have told much that is worth telling about

this new light, and we can only express our admiration of the scientific* and engineering skill displayed in this work, and we think all praise is due to the organizing powers for the completeness of the general arrangements, in the establishment of a remarkably superior light where it must be of the greatest value to navigation.

SOCIETIES.

MEETINGS, ETC.

GEOGRAPHICAL.—The fourth meeting of the present session was held on Monday, January 9th, in the great hall of the University of London, Sir H. C. Rawlinson, K.C.B., Vice-President, in the chair. The paper read was on "The Gibraltar Current, the Gulf Stream, and the General Oceanic Circulation," by Dr. W. B. Carpenter, F.R.S. The author commenced by an allusion to the investigations carried out, for three years past, with the aid of the Hydrographic Department of the Admiralty, into the nature of the deep sea, and detailed the observations conducted by himself and Staff-Captain Calver, of H.M.S. *Porcupine*, on the outflowing undercurrent at the Straits of Gibraltar. He showed on what insufficient observations the supposition of a current flowing outward from the Mediterranean had hitherto rested. An outflow of this nature was a necessary hypothesis: for the excess of saltness caused by the great surface-evaporation (naturally of pure water only) from the Mediterranean would otherwise be most sensibly felt in the waters of that sea; and this was not compensated by rainfall and rivers, or by the water flowing in to restore the level, which consisted of Atlantic salt water setting inwards, in a surface-stream, at the rate of three miles an hour. It was singular that the shallowest part of the Straits was not where they were narrowest, at Gibraltar, but much farther to the west, between Capes Trafalgar and Spartel; the sea-bottom slopes westward from Gibraltar, where it averages about 400 fathoms, to the western extremity, where the depth is scarcely fifty fathoms on the northern, and 200 fathoms on the southern half. After repeated

* Professor Tyndall has personally inspected and advised upon the scientific portion of the work, and has expressed much satisfaction in the arrangements generally.

observations, aided by the ingenious mechanical contrivances of Captain E. K. Calver, the existence of a deep-water current setting outwards was finally established. It was true the stream must thus be supposed to flow up-hill along the sea-bottom from Gibraltar to the shallow ridge westward (the true limit of the Mediterranean basin); but this was shown to be the natural action of flowing water under such circumstances.

Dr. Carpenter then explained that this interchange of water between the Mediterranean and the Atlantic was in accordance with a simple physical law, and that the same law, in its wider application, threw a new light on oceanic circulation and marine currents throughout the globe. As the surface-water of the superheated Mediterranean ascends by evaporation, leaving its saline constituents behind, the remaining water, becoming denser and heavier by its increased saltness, sinks beneath the less salt Atlantic water flowing inward by the Straits, and is eventually forced outward as an undercurrent, as proved by the recent observations. If the accession of fresh water by rain and rivers in the Mediterranean had equalled the amount evaporated from the surface, instead of being much the reverse, there would have been no current and counter-current at the Straits of Gibraltar; and, if the fresh water supplies had been greater than the evaporation, there would have been a surface-current outwards of the lighter water. This last hypothetical condition is precisely that of the Baltic in regard to the North Sea, in which case there is a surface-flow of fresh water outwards and an under-current of heavier sea-water inwards. It was obvious that a like circulation of waters (the lighter above and the heavier below, in opposite streams) must take place in any case in which a want of equilibrium between two columns of water is constantly maintained, whatever might be the agency producing it. A great difference of temperature at two extremities of a great ocean must cause two such currents to be set going on a vast scale; for, as in the cold area, water contracts and becomes heavier by the cold, its level must sink, and the general oceanic level be continually maintained by a flow of warmer and lighter water from the warmer areas of the same or adjoining ocean. The recent investigations had supplied results in accordance with this hypothesis. Such circulation of oceanic water being universal, Dr. Carpenter had found reason to doubt the received opinion of the Gulf Stream being the direct cause of the set of warmer water towards North-Western Europe and into the Arctic circle; the Gulf Stream was rather a local accident of the oceanic circulation, resulting from configuration of the land past which it flowed, and its existence as a stream much

beyond the banks of Newfoundland was not proved. A beautiful experimental illustration of opposite currents was exhibited by the author. At the extremities of a long glass trough, filled with water, upright tubes were fixed; one of which was filled with ice, and the tube at the opposite end heated by a gas jet. On blue colouring matter being inserted at the cold, and red at the warm end, the two separate streams became visible, the red near the surface and the blue below.

A discussion of some length followed the reading of the paper, in which Mr. A. G. Findlay (who had opposed, many years ago, the prevailing views regarding the Gulf Stream), Mr. F. Galton, Admiral Sir Edward Belcher, Mr. J. Ball, Admiral Ommanney, Dr. Williamson, and Mr. J. Laughton, took part. The last-named gentleman objected that Dr. Carpenter's views took no account of the well-known existence of a surface oceanic circulation, such as the Polar southerly current down Baffin's Bay, towards the East American coast, and the return north-easterly currents in the Indian Ocean and the South Pacific. Dr. Carpenter replied that these currents were local accidents of the general oceanic circulation, and depended on prevailing winds, shape of land, and so forth.

The fifth meeting was held on Monday evening, the 23rd of January, Sir Henry C. Rawlinson in the chair. The paper read was—"On the recent German Arctic Expedition," by Captain Sir Leopold M'Clintock. The expedition sailed from Bremen, in the presence of the King of Prussia, on the 15th of June, 1869, in two vessels; one the *Germania*, a steamer of 143 tons and 30 horse-power, the other the *Hansa*, a sailing vessel of 242 tons. The undertaking was supported by public subscription in Germany, and originated in the spirited advocacy of Dr. A. Petermann, who had conceived that an open sea existed round the Pole, which could be reached by persevering attempts to pass the outer girdle of ice which surrounded it. The expedition was not successful in its main object, although minor discoveries of great interest had rewarded its efforts. The *Germania* reached its most northerly point (75° 31′) between the 10th and 15th August, wintered on the coast of Sabine Island, and despatched sledge parties along the coast northward, which reached, on the 15th April, 1870, lat. 77° 1′ N., and long. 18° 50′ W. In the following summer a deep fiord was discovered, penetrating far into the land between Capes Franklin and Humboldt, surrounded by a picturesque Alpine country, with one peak 14,000 feet high. The temperature of the air here in August was 54⅓° Fahr., and the shores abounded in reindeer and

musk-oxen. The *Germania* reached Bremerhaven on her return September 11th. The *Hansa* was not so fortunate. It parted from the sister ship in the ice-fields off the coast of Greenland, and all efforts to reach the land were frustrated. The winter caught the vessel in the midst of the ice; and on the 19th of October, 1869, it was crushed, during a storm, between immense floes, and finally wrecked. The crew escaped, and wintered on an ice-floe, on which they were floated southward in the spring, and from which they escaped to Fredericksthal, in Southern Greenland, in their boat, after spending 200 days on the ice, with fearful sufferings. In the discussion which followed, Captain Sherard Osborn and Admiral Collinson expressed their admiration of the fortitude and resources shown by the unfortunate crew of the *Hansa*, and reverted to their formerly expressed opinions that an expedition towards the North Pole could have chance of success only by following the route by Smith Sound and organising sledge parties to follow the line of coast. Mr. Whymper, Dr. Rae, and the Chairman also took part in the discussion.

LIFEBOAT SERVICES IN 1869 AND 1870.

Amidst wars and rumours of wars, whilst the two leading nations of Western Europe are engaged in mortal strife—amidst the groans and cries of tens of thousands of wounded and dying men and the tears and lamentations of countless numbers of bereaved women and children—from the sickening spectacle of man engaged in destroying his fellow-man—it is pleasant to turn to the contemplation of any work and labour of love.

War, indeed, calls into exercise heroic virtues, and tender and compassionate feelings and acts, which have perhaps never been more nobly displayed than during the present fearful struggle between Germany and France; but still the whole thing savours of blood, and although we may hope that in the wisdom of God the present evil is permitted only to bring about, as a result, a greater and progressive good, yet the evil is immediately present, while the good we cannot foresee.

But a few months ago there were around the Coasts of France, as around our own, lifeboats with able and willing crews, ready at any moment to risk their own lives to save those of others cast away on their shores. Those boats to be sure remain, but like only too many

of the brave fellows who formed their crews, and who have since died in defence of their country, they are now but inert and lifeless bodies from which the souls have fled, the crews who gave them life being called away for their country's defence, and being engaged in destroying the lives which under happier influences they would have risked their own to save—so essentially is the Lifeboat Service a Work of Peace.

Fortunately our own country remains at peace, and its lifeboat work is pursued as assiduously, and with the same success as hitherto. To be sure the income of the Lifeboat Institution has been very considerably reduced during the past year, owing to the diversion of funds, which it would otherwise have received, to the aid of the sick and wounded and other victims of the war; but this, we may feel sure, is only a temporary loss, and when peace is again restored, little doubt can be entertained that the stream of British charity will return to its accustomed channels once more.

During the past year the lifeboats of the National Lifeboat Institution have saved 513 shipwrecked persons, whilst in the stormy year 1869 they saved no less than 871. These noble services of the lifeboats have varied much in character, many have been performed during the dark hours of night, others by day, but the same glorious result has in nearly every instance followed them, the salvation of imperilled men from a watery grave. It is also a providential fact, and deserving of special record and acknowledgment, that notwithstanding the lifeboats of the Institution have been manned on all occasions during the past two years by between 12,000 and 13,000 persons, not a single life has been lost from them during that period.

Still, it should be remembered that the work of saving shipwrecked persons, even in the best equipped lifeboats, must always be one of danger, and that no little courage and hardihood are required on the part of those who engage in it. By giving their invaluable aid they perform their full share of the duty of alleviating and reducing the amount of the misery and evil produced by the storms on our coasts. It remains for those who cannot share the risks and exposure which those gallant men incur to perform their part in this humane work, by enabling the Institution to continue without slackening its great and philanthropic work on behalf of the shipwrecked sailor. The National Lifeboat Institution, therefore, appeals to all benevolent and generous persons in the Kingdom to contribute towards so good a cause. We may add that contributions in aid of the great and important work of the National Lifeboat Institution are received by all the Bankers throughout the United Kingdom, and by the Secretary, at the Institution, 14, John Street, Adelphi, London.

COMMUNICATIONS.

Rule of the Road for Rivers.

Dear Sir,—In the latter part of the article on the "Rule of the Road," in the January number of your New Series, allusion is made to the recent collision of the steamers *Leo* and *Velocity*, and to the uncertainty which pervades the minds of masters of vessels, as to whether any, or no rules are in force for the navigation of the River Thames. An endeavour further to elucidate this subject may not be considered altogether irrelevant in the pages of the *Nautical Magazine*. In pursuance of this view let us take a glance, first at the proceedings of these vessels, then at the judgment arrived at, and the present state of the law for steamers navigating the Thames. The evidence adduced as to the courses of these two steamers is as usual somewhat contradictory, yet a tolerably accurate knowledge of the facts may be obtained. It appears that the *Leo*, a paddle steamer, was bound down the river in ballast, and going at the rate of ten miles, or knots, an hour. She passed the east point of Woolwich Reach, and proceeded down Galleons Reach, nearly in mid channel, still going at full speed. The *Velocity* was at the same time bound up the river, and on rounding Margettness Point, or the west point of Barking Reach, steered up the Galleons Reach, also nearly in mid channel. The master of the *Leo*, from the steering of the *Velocity*, believed she would pass between his vessel and the Kentish shore, or what is called for convenience the south shore, and he ordered the helm of the *Leo* to be starboarded a little to enable her to do so. The master of the *Velocity* appears in the first instance to have thought of passing as indicated, but when within 200 yards of the *Leo* to have suddenly changed his mind, and ordered the helm to port, for the purpose of passing on the Middlesex, or, as it is called, the north side of her. These masters seem to have been experienced men, attending to their duties. Can we then ascertain why the master of the *Velocity*—as he has not very clearly explained it himself—changed his mind suddenly? The first reason that presents itself to the mind is that, as stated by some witnesses, there is a practice for steamers when passing each other in opposite directions to port their helms, and to keep on the port side of each other. Or it may have suddenly occurred to him that the steering and sailing rules of the Act of Parliament require that when two ships under steam are meeting end on, or nearly end

on, so as to involve risk of collision, the helms of both shall be put to port, etc. Now, in porting the helm, it may fairly be conceived that he thought he had time to pass clear of the *Leo* before she would strike his vessel, in this he was frustrated by the great speed at which the *Leo* was steaming. In considering this case it must be borne in mind that the Galleons Reach is a short mile in length; that at the speed at which these steamers were nearing each other, the one going ten and the other at least four knots an hour, they would run the distance between them, from the time they first saw each other, in about four minutes and seventeen seconds; and that these vessels were steaming throughout to pass very near each other, the *Leo* without slackening speed in the least.

The decision places the whole blame on the *Velocity*. Doctors differ. Some are of opinion that the *Leo* was also to blame for not easing her engines, and reducing speed until she had passed the *Velocity*. Now let us endeavour to ascertain what the present law is for steamers navigating the River Thames. By the 31st Section of the Merchant Shipping Act Amendment Act of 1862, the Local Authorities have the power of establishing rules for the navigation of the waters placed under their management. The local authority in this case is the "Thames Conservancy Board." The question arises, what rules have this Board enacted? All that can be found in the Conservancy Acts, or Bye-laws, is contained in the 36th Bye-law, in these words:—"Every vessel shall at all times while passing on the river be navigated in a careful and proper manner, as well with regard to the safety of such vessel as of other vessels passing and re-passing on the river." By many this is considered to be merely puerile advice, and no rule for sailing. It certainly contains nothing which will assist vessels in keeping clear of each other under the varied and differing opinions amongst men, of whom you find the intelligent and attentive, the stupid and careless, and, I am sorry to say, occasionally the muddled. The members of the Conservancy Board having discovered about two years since the total insufficiency of this advice as a sole rule for the navigation of the river, advertised in some of the public papers that the steering and sailing rules of the Act before named are adopted by that Board as applicable to the river as well as the sea. Yet nothing of this is to be found amongst the Conservancy Bye-laws. And it is held by many that the mere publication in public papers does not constitute law, and, therefore, that there are at present no precise rules for this most important navigation.

All the circumstances attending this collision of the *Leo* and *Velocity* shew unmistakeably that rules and regulations are wholly

ignored and treated with contempt, even the friendly advice to navigate carefully by assessors and commanders of steamers equally. This state of things has given rise to much discussion and remonstrance. It is maintained by many that the old rule, which requires that steamers navigating narrow channels shall, whenever it is safe and practicable, keep to that side of the fairway or mid-channel which lies to the starboard side of such steamer, should be re-enacted, with a rule making steamers, when navigating the bends of the river in opposite directions, always to be considered meeting vessels. On the other hand it is contended that all the latitude possible should be given, and that there should be no restrictions to the free navigation of the river. Those who argue in this way prefer to trust to the glorious uncertainty of the law, when they get into difficulties. There is still another class of men who arrogate to themselves exclusive knowledge of the navigation of the Thames, and try to mistify matters by talking of the slack water and eddy, which is naturally felt when on the side of points which make angles with the direction of the stream, although all these slacks and eddies are as well known, and form as little impediment to the proper navigation of steamers as the stream itself. They remind one of the Deal boatman, who declared on oath that no Londoner could understand the tides at Deal, simply because the direction of the stream changed about half-tide, instead of at the times of high and low water.

Whatever may be thought of all these opinions, it seems undeniable that to leave these matters in their present confused and most unsatisfactory condition will be scarcely less than criminal.

I am, dear sir, your obedient servant, AN OBSERVER.

To the Editor of the Nautical Magazine.

[We concur in the general tenour of our correspondent's letter, that there is something unsatisfactory in the present state of things as regards the Rule of the Road for rivers. But bearing in mind that the international regulations apply to all sea-going ships wherever they may be navigating, it is clear that they are applicable to sea-going ships approaching each other in the Thames. Whether some law might not be made to regulate *local* rules for small vessels which only navigate rivers is a question worthy of consideration, but it should be clearly understood that as the law now stands, sea-going ships in rivers are amenable to the existing regulations for the Rule of the Road. We also cordially agree in our correspondent's remarks about the folly of listening to people who talk about "slack water" and "eddy" in such a case as that of the *Leo* and *Velocity*.—ED. *N. M.*]

A BIT OF A SAILOR'S MIND.

Bit the Fifth.

Previous to the Indian Mutiny nothing seemed to annoy an East Indian officer more than to question the loyalty and good faith of the Sepoy army; but after the outbreak, when these same gentlemen were reminded of this, their answer was, "Heaven forgive me for the falsehood, but it was the fashion to praise them to the skies."

A correspondent of the "Standard" calls the Royal Naval Reserve a *sham*, and in ventilating the reality and efficiency of the force, one treads on very dangerous ground.

Not having had the honour of serving in the Royal Navy with the force, but feeling an interest in them, I scraped an acquaintance with a Coastguard man and found that he had served the Queen with them, and asking him for his opinion I found it did not tally with what was published by the friends and promoters of the movement. He said of all the "uselessest" fellows he ever saw in a man of war, they were the worst. They could hardly be got to answer their muster, let alone assisting if the watch were turned up, and told the regular crew they did not come there to work.

I was sorry to hear him speak so harshly of them, as I and many others always gave the R. N. R. the preference when engaging hands, as some will have it they are the *elite* of the merchant service, whatever that may be. I always found them certainly no better than others, but being better paid they can afford to be more saucy and insubordinate; and I cannot say that their outfit for sea service was one whit more efficient.

I think the taxpayer is justified in asking why, as the land volunteers are not above finding their own uniforms, this Naval Reserve, who get pay all the year round, should not be obliged to dress like sailors, seeing that their pay is equal to two-thirds of what an English soldier gets and double what a continental soldier receives. Yet it is a force that is never seen in uniform.

Surely to be efficient they should be clad properly, and I would suggest that the shipping master should insist on their coming for their pay in decent clothes, and bringing a certificate from the Sailors' Home that they have a proper sea kit; or the outdoor officers could certify this. Then we should be somewhat sure that in giving the R. N. R. the preference, the men would be all right

as far as clothing went. It is said that some of the turnpike sailors (tramps), that have increased so much since Jack has been inured to jail life, are men of the R. N. R., playing at Box and Cox with the authorities—that is, keeping two books and drawing pay in two places, working double tides, getting eightpence a-day, with £1 1s. per week when on board the drill ship, and not going to sea.

This paper reserve I hope the Government will get when they want them, which is more than the Shipping Act can do with our crews, with all its 570 clauses, as no merchant ship gets what she pays for; the crews are never up to time. Things managed themselves better in former times, when the law was short and simple. Thus said 1830—England expects *every* man to do his duty, or take the consequences.

[We are always glad to receive the acute and sensible remarks of our friend who occasionally favours us with a bit of his mind; but we think he is a little too hard on the R. N. R. It must be remembered that the Naval Reserve is a comparatively youthful institution, which by judicious management may *eventually* be made most serviceable. Of course, there are bad men amongst them, as is the case in any large body of men, but we question much whether R. N. R. men are, on the whole, worse than the rest of the merchant seamen. We are also inclined to think that the Coastguard man alluded to may have been under the influence of the "green-eyed monster."—Ed. *N. M.*]

The annual appearance of certain Admiralty publications, viz., The Lists of Lights of the British Islands and of the World, and the Tide Tables for British and Irish Ports,* is a source of much satisfaction to the maritime community generally. We need not say much as to their usefulness, every nautical reader knows, and no doubt appreciates, their value; but we would observe, that the 1871 editions display the usual care and completeness in their compilation, and are as much as ever deserving of the confidence of maritime men. Apart from the importance which attaches to them as official publications, the well-known names of the experienced officers who have contributed to them, would be a sufficient guarantee for the reliability and value of the information contained in the works.

* Sold by J. D. Potter, 31, Poultry, E.C.

We observe that during the past month the Shipping Gazette has published daily a Wind Chart of the British Isles. The information is supplied direct from the Meteorological Office, and must be of great value to the shipping community. The direction of the wind at various points round the coast is indicated by small arrows, the wind coming from behind the arrow; the force is represented in each case by a figure at the tail of the arrow. The chart shews at a glance the state of the wind all round the coast on each day, and will no doubt be most useful and reliable for reference.

FRENCH LIGHTS.—Notwithstanding the many reproaches that are constantly directed against England respecting the attitude maintained by her with regard to the combatants on the Continent, there is little doubt that she has expended much humane and generous sympathy upon the sufferers on both sides; sympathy which has in many ways taken the practical form of material relief. Poor incapacitated France, among her innumerable troubles, has been compelled to ask assistance in keeping her coast lights burning. Her lighthouse stores are shut up in Paris, and she piteously asks of England, "Give us of your oil." Most gladly and willingly is this request responded to, and the Trinity Board, acting for the common good of all nations whose navigation would be imperilled by the extinction of the guiding lights, are doing all in their power to prevent such a calamity. This timely aid is dictated by those universal principles of humanity which rise above questions of mere international law as between neutrals and belligerents. We are reminded of the story of the former French monarch who rebuked an overzealous officer for taking certain English lighthouse keepers prisoners, and who, in liberating the captives, observed that though he was at war with England, he was not at war with humanity. And the assistance now rendered to our neighbours in their hour of need from our full stores, may, perhaps, be regarded as a graceful recognition on our part of the noble principle involved in the royal speech.

IN our next number will be published the commencement of a serial story entitled, "JAMES KENNEDY, A TALE OF THE WAR-TIME."

MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
139	Red Sea — Bab-el-Mandeb Strait — Perim Island.	Re-establishment of revolving light.
1	Red Sea—Mocha.	Priam Shoal not in existence.
2	Australia—Queensland.	Reef off Cape Palmerston.
	" Victoria—Port Albert...	Alteration in light.
3	Scotland — West Coast — Sound of Jura—Skervuile.	Alteration in light.
4	Africa—West Coast—Gambia River —African Knoll.	Buoy and cage placed on it.
5	England — East Coast — Thames— Sunk Light.	Alteration in light.
6	United States—Charleston Harbour —Sullivan Island Light.	Alteration in position of light.

NOTICES.

(All bearings are Magnetic.)

139 (last Number for 1870).—*Red Sea—Bab-el-Mandeb Strait—Perim Island.*—The *revolving* light is re-established.

Charts affected, Nos. 2523, 8a, 10a, 748b, 6b, 2592, and 598.

1.—*Red Sea—Mocha.*—The shoal described as the *Priam Shoal*, lying W.S.W. 8 miles from the north end of Mocha, is proved not to exist, and is removed from the Charts.

Charts affected, Nos. 8a and 2523.

2.—*Australia—Queensland.*—A reef, 1 cable in length, called *Marsh Reef*, has been discovered in lat. 21 42′ 20″ S., long. 149° 48′ 20″ E. The reef is awash.

Charts affected, Nos. 2759a, 2763, and 346.

Victoria—Port Albert light will, on 1st April, be changed from a red to a *white* fixed and flashing light, visible 11 miles.

Charts affected, Nos. 2759b and 1695.

3.—*Scotland—West Coast—Sound of Jura—Skervuile or Iron Rock.*—Speed of revolution of light to be changed, on 1st February, from every minute to a flash *every half minute.*

Charts affected, Nos. 1824a, 2635, 2478, and 2515.

4.—*Africa—West Coast—Gambia River—African Knoll.*—A *black* buoy *with cage* has been placed on the east end of the knoll in lat. 13° 34′ 40″ N., long. 16° 36′ 50″ W. Also, there is now no light vessel on the knoll.

Charts affected, Nos. 608 and 599.

5.—*England—East Coast—Thames Entrance—Sunk Light.*—The alteration in the light has been made. It is now a *revolving* light showing a flash *every forty-five seconds*, alternately *red* and *white*, of nearly equal power; by day a half ball over the usual ball, at the mast head, is shown.

Charts affected, Nos. 2902a, 2052, 1975, 1610, 1598, 2765a, 1406, 1, 2339, and 2182a.

6.—*United States—South Carolina—Charleston Harbour—Sullivan Island Light* has been *moved* to the north-west 333 *yards*, or a little to the eastward of Fort Moultrie.

Chart affected, No. 2806.

HYDROGRAPHIC.

THE following information is extracted from Hydrographic Notices issued from the Admiralty, the particulars being furnished by Navigating Lieutenant J. T. Gowlland, R.N., Admiralty Surveyor.

WINDS AND WEATHER ON THE COAST OF NEW SOUTH WALES.

THE prevailing winds on the coast of New South Wales may be said to blow from the north-east between October and March, and from west to south-west between April and October, subject to variations from other quarters of short duration. The sea breeze from the north-east during summer sets in gently in the early forenoon, preceded by a calm, with a hot sultry atmosphere; it gradually freshens towards noon, and about the middle of the afternoon is at its height, blowing a stiff double-reefed topsail breeze, and accompanied by a disagreeable moisture in the atmosphere. Objects are only indistinctly seen through this haze at a distance of five or six miles.

These winds vary in strength, and are occasionally moderate, nearly always falling light about sunset, but if not, the breeze may be expected to continue till midnight, and then drop suddenly to a calm. If the barometer has been observed to fall during the previous twelve hours, they are almost certain to be followed by what is known in the colony as a "southerly burster." This heavy burst of wind must be looked out for, as it comes on frequently with a clear sky, and no atmospheric warning. Strangers should be on the alert for these sudden changes of wind to the southward in the

summer season, as they blow violently for an hour or two, and give little time to shorten sail; even coasters, and regular traders with local knowledge are caught occasionally, losing sails or spars.

When the barometer stands high (30·20 to 30·40) and is steady with the fall of the north-east breeze, little fear may be entertained of a "burster." The wind in this case falls light, veers round to north-west and west, and blows gently off the land during the remainder of the night.

These general directions, however, are not always to be depended upon, but ample warning will be afforded by the falling of the barometer, and the singular lightening of the sky to the south-west and southward, to which quarter the wind will gradually veer, and freshen up to a strong gale. Bad weather may then be expected, bringing with it rain and a dense atmosphere, lasting frequently from two to four days, the wind veering from S.S.E. to S.S.W., and blowing violently in squalls.

The navigator acquainted with the coast, or sure of his position, when to the southward of Sydney, may make a fair wind of this, and run to within five or six miles to windward of the heads, and the same distance off shore, when he should heave-to with the tug and pilot flags flying, and wait a chance of being seen from the signal station during any temporary break in the weather. He may generally depend upon getting into port in an hour or two later, as the tug is always in readines, and will take off a pilot.

The hot winds, which come from the north-west, deriving their high temperature from the interior of Australia, produce a disagreeable, dry, oppressive, enervating atmosphere, which is frequently injurious to health. The lurid appearance of the sky to the north-west and the barometer, which falls in proportion to the strength of these winds, give unfailing warning of their approach, but being off the land they are not much feared by vessels. These winds usually come on in the forenoon, and blow more or less violently till evening, sometimes lasting for two days; when heavy black banks of clouds, charged with electricity, will be observed rising from the south-west and southward, and rapidly approaching. The wind will shift almost instantly from the hot north-west quarter in a squall to south-west, accompanied with a burst of thunder, lightning, and heavy rain, which will continue more or less violently from three to twelve hours, veering first to the southward, and on the following day to the south-east and eastward, with fine weather, and a pleasant rarefied atmosphere. The sudden change of temperature with this shift of wind, though perhaps trying to delicate constitutions, is no less marked than

agreeable; the thermometer in the shade having been known to fall from 110° to 68° in less than an hour.

Towards the end of March the north-east winds cease, and in April the westerly winds commence, and last till September, a season of clear, bracing atmosphere, and a bright sky. Small fleecy semi-detached clouds, rising to an elevation of about 30°, and remaining in the western quarter of the heavens indicate the approach of the westerly winds; the barometer always falls as their strength increases.

These winds come on between 8 and 10 a.m., suddenly, even within ten minutes, rising from a calm or light air to half a gale of wind, and blow strongest with fierce squalls from about noon to 3 p.m., dying away at sunset and succeeded by light variable airs during the rest of the night.

With a prevalence of these winds, the weather is refreshing and healthy.

Vessels navigating the coast during the winter season, will not only avoid the current, but ensure getting smooth water by keeping close in-shore, though the wind will be puffy from the proximity of the land.

The interruptions to the land winds are gales from the south, south-east, and east. The two former come on with a high barometer, which in no way indicates their approach, and last two to five days accompanied by thick rainy weather, during which the land is difficult to distinguish two or three miles off. It is remarkable that whilst the barometer falls during the summer months to the approach of a southerly gale, it always stands highest during a continuance of the wind from that quarter, in the winter months.

In July, 1868, for example, a southerly gale sprung up with barometer at 30·26, and continued to blow with great violence, shifting in rain squalls from S.S.W. to S.S.E., for two days, the barometer steadily rising the whole time to 30·52, when it suddenly fell, to as sudden a shift of wind in a terrific rain squall from the north-east; in less than twelve hours the barometer stood at 29·68, blowing a westerly gale with clear weather.

The easterly gales, which appear to be regular in the number as well as the periods of their visits during the year, are the winds of all other most dreaded in the province, both on shore and afloat, bringing with them floods causing great destruction of property, and loss of life on land and at sea. June, July, and sometimes August are the months in which the province of New South Wales is visited by these gales in their full violence. During these months, when the weather is unsettled, with the wind unsteady,

cloudy weather and occasional rain, easterly gales may be looked for. They generally come with light winds from the northward, accompanied with rain sometimes lasting twenty-four hours, and an overcast, murky sky; veering round to the north-east, they freshen gradually into a gale, which increases and blows with more or less violence for two or three days, veering from N.E. to E.S.E., accompanied with masses of heavy leaden-hued clouds, and sheets of incessant blinding rain. The atmosphere at times is so thick as to render it difficult to see objects a quarter of a mile distant. They blow themselves out from north-east and north and die away with a falling barometer, veering to the westward with fine clear weather immediately afterwards.

When the season of these gales is passed, a continuance of fine, westerly weather may be looked for, of from six weeks to two months duration, interrupted perhaps with a fine weather sea breeze occasionally, but the general winds and weather from this time till the end of September is from the westward and fine.

The directions in Australia Directory, Vol. I., page 486, relating to the barometer cannot be improved, except to add that the greatest mean height of the barometer takes place in August and September with south-east and southerly winds, and the lowest mean height in December, January, and February with north-west winds. The highest range being 30·92, and the lowest 29·26, over an interval of five years. During winter months a marked fall in the barometer is certain to be followed by westerly winds and fine weather, whatever may be the quarter or the conditions under which the wind may be blowing when it commences to fall. During the summer months it may be similarly and as surely depended on as the forerunner of a north-west hot wind. These are two cases in which the barometer may be implicitly relied on to indicate coming change of the wind and weather, and there will then be little fear of the wind altering when in this quarter whilst the barometer remains low and steady.

During the summer months the barometer generally falls to the approach of a southerly gale whilst the north-east wind is blowing, but this fall must not be implicitly relied on, as southerly gales occasionally occur without any perceptible change in the glass.

Australia.—Newcastle Harbour.

Two leading lights are established on the hill over the town, between the Scotch and Roman Catholic churches. At night a white light seen over a *red* light kept in line bearing S.W. ¼ S., will lead

in mid-channel clear of the 13-foot rock off the Boulder Point on the north-west side of the breakwater, and up to the black buoy off the Government boat-shed. By day, the red and white towers in which the lights are placed will be seen, and answer as leading marks, the red tower being the upper one.

This port should never be attempted without a pilot. A vigilant look out is always kept from Nobby Head and from the Harbour Master's hill, and vessels with the signals flying are promptly attended on by both pilot and tug steamer.

A quarter of a mile N. by W. ½ W. from Nobby Head light-house on the north side of the channel is a green wreck buoy, showing the position of the *Cawarra* steamer, which foundered when endeavouring to enter the harbour during an easterly gale in July, 1866. There are five feet over the iron framework of the paddle-wheels at low water. This wreck forms the nucleus of a bank which in time may become a serious obstruction. Many vessels have been lost on entering this harbour, resulting nearly in every case through an endeavour to enter during south-east and easterly gales.

The easterly and south-east gales on this coast are always accompanied with incessant rains, flooding the lowlands and causing strong freshets in the rivers. They raise a mountainous breaking sea at the entrance of the harbour, in a line from the outer end of the reef off Nobby Head (Big Ben) across to the eastward of the Oyster Bank. This mass of breaking sea would of itself be sufficient to overwhelm ordinary sized vessels; but when, in addition, a freshet of six or seven knots sets out of the river against this heavy easterly roll, to attempt to enter is almost certain destruction. It is therefore to be impressed on seamen, during a hard east or south-east gale, with rain that has lasted more than twenty.four hours, not to attempt to enter Newcastle, but either to keep to sea or make for Port Stephens.

Port Stephens.

Although the directions given in the Australia Directory for entering Port Stephens are all that can be desired in fine weather, still it is found that in bad weather, when the place is more frequented as a harbour of refuge than at any other time, some of the marks given are too distant to be distinguished in rainy or misty weather.

Leading Mark A, as described in Vol. II. page 43 of the Australia Directory, can nearly always be seen leading across the

eastern tail of the Entrance bank in twenty-seven feet. At night, Port Stephens light kept in sight answers the same purpose; run with this on until the north end of Little island is touching the south side of Yacaaba head, bearing E. by N., keep this mark on until Mount Stephens is seen over the low neck between Toomeree summit and Station Peak, bearing S.S.E. ½ E.; the vessel is then to the northward and westward of the Entrance shoal in six fathoms, and may steer up for Nelson head, passing it within half a cable, if necessary, in ten fathoms of water.

The northern end of the sandy beach in Nelson bay kept in line with and about half way down the south slope of Toomeree summit, bearing E. ½ N. nearly, will lead northward of the rocky knoll off Red Patch point, and carry a vessel in twenty-four to twenty-seven feet across the bank stretching to the northward from Sandy Point and Corlette head.

There is a telegraph station at Nelson bay as also at the light-house outside.

Vessels bound from Port Stephens to the northward can pass between Cabbage-tree Island and Yacaaba Head, passing the latter about two cables distant, and keeping close along inshore to avoid the current, will find a deep water channel between the mainland and the Broughton Islands.

GENERAL.

THE ROYAL NATIONAL LIFEBOAT INSTITUTION.—On Thursday, 5th January, a meeting of this institution was held at its house, John-street, Adelphi; Thomas Chapman, Esq., F.R.S., V.P., in the chair. There were also present Earl Percy, M.P., Sir Edward Perrott, Bart., W. H. Harton, Esq., Colonel Fitzroy Clayton, Richard Lewis, Esq., and Captain Ward, R.N.

The minutes of the previous meeting having been read, rewards amounting to £358 were voted to the crews of various lifeboats of the institution for going out on service during the recent storms. In many cases the lifeboat men suffered severely from the intense cold. The Tynemouth No. 2 lifeboat, after several gallant attempts, succeeded in saving the crew of seven men from the wrecked brigantine *Amalia*, of Stavanger. The lifeboat at Porthcawl, South Wales, rescued three men belonging to the smack *Dasher*, of Cardiff. The Ramsay lifeboat, *Two Sisters*, took off from the smack *Pearl*, of

that port, the crew of three men, just before their vessel sank. The St. Andrew's lifeboat aided nine fishing boats and their crews to regain that harbour through a heavy ground swell. The lifeboat at Withernsea saved four men from the stranded brigantine *Annie*, of Hartlepool. The *Fair Maid of Perth* lifeboat, at Ardrossan, saved the crew of six men from the brig *Morning Star*, of Dublin. The Ramsgate lifeboat *Bradford* and harbour steam tug *Vulcan* brought into harbour the schooner *Marin*, of Terno, which vessel had gone on the Goodwin Sands. The Chapel lifeboat *Godsend* saved four men from the smack *Robert Hellyer*, of Hull. The Wexford Civil service lifeboat assisted to save the stranded smack *Arbitrator*, of that port, and the nine persons who were on board the vessel; and on a subsequent occasion rescued the crew of seventeen men from the Spanish barque *Paquite*, which had gone on the Dogger Bank, off the Irish coast. The Caister large lifeboat helped to save the brigs *Donne Castle* and *Wanderer*, of Whitby, and their crews, and the small lifeboat on that station (the Boys') rescued the crew of ten men from the wrecked brig *Thomas and Joseph*, of South Shields. The Southport lifeboat brought ashore the crew of the schooner *Jessie*, of Gourock. The Lowestoft large lifeboat rescued fifteen men from the barque *Forest Flower*, of Scarborough. The Mincing-lane lifeboat, at Montrose, saved the crews, numbering twenty-four men, from four fishing boats. The Huddersfield lifeboat, at Hasborough, took eight men from the sinking boat of the brig *Minerva*, of Seaham, and the Mundesley lifeboat (the Grocers') rescued five men from the schooner *Flora*, of Margate. The silver medal of the institution, and a copy of the vote inscribed on vellum, were granted to Mr. George R. Scott, boatswain of the ship *Beethoven*, of St. John's, North Britain, for his gallant conduct off the mouth of the Mersey on the morning of the 16th of October, during a gale of wind and in a heavy sea, when he rendered most important service to a vessel in distress. Several other rewards were likewise granted to the crews of different shore boats for saving life from wrecks on our coasts, and payments to the amount of £3,035 were ordered to be made on various lifeboat establishments. The committee expressed their sincere sympathy with Mr. John Walter, M.P., and his family, on the sad bereavement occasioned by the drowning of Mr. Walter's eldest son in a noble attempt to save his brother and cousin. Various liberal contributions to the institution were announced as having been sent from Edinburgh, Glasgow, Manchester, Mark-lane, and other places. It was reported that the receipts of the society during the past year, owing to the war and other causes, had fallen short of its expenditure by upwards of £2,000.

A cordial vote of thanks was passed to Thomas Chapman, Esq., and to Sir Edward Perrott, Bart., for their able conduct in the chair, at the meetings of the institution during the past year, and to the secretary and inspectors, in acknowledgment of the ability and zeal with which they continued to discharge their important and arduous duties.

THE LOSS OF HER MAJESTY'S SHIP *Psyche*.—A Malta correspondent writes, under date of Valetta, January 4th:—"The court-martial ordered to investigate into the loss of Her Majesty's steam-vessel *Psyche* on a sunken rock off Cape Molino, near Aci Reale, on the east coast of Sicily, was assembled on board Her Majesty's ship *Hibernia*, on Friday last, the 30th December, under the presidency of Rear-Admiral Cooper Key, C.B., F.R.S., Admiral Superintendent at Malta and second in command of the Mediterranean Squadron. The court was further comprised of Captain H. S. Hillyar, C.B., of Her Majesty's ship *Royal Oak;* Captain T. Cochran, of Her Majesty's ship *Caledonian;* Captain W. Armytage, of Her Majesty's ship *Prince Consort;* and Captain T. Brandreth, of Her Majesty's ship *Lord Warden;* Mr. H. G. Barlow, secretary to the Rear-Admiral, officiating as deputy judge-advocate. The narrative of the circumstances attending the *Psyche* taking the ground, which was prepared by Lieut.-Commander Fellowes, was read to the court, and the case for the prosecution on the part of the Crown occupied the whole of Friday. From what transpired before the court it would appear that when nearing Cape Molino, on the way from Naples to Catania, going at a speed of twelve knots, and at a distance of one and a half or one and three quarter miles from the shore, Mr. Norman Lockyer, the gentleman in charge of the Government Eclipse Expedition, went on the bridge and asked Lieut. Fellowes to spare him a few minutes to arrange about the landing of the astronomical instruments at the various points along the coast, as might be found necessary. Lieut. Fellowes then left the navigating sub-lieutenant, Mr. Scott, in charge, with instructions not to alter the course without special order from him; he had been off the bridge and on the quarter-deck about ten minutes when the vessel struck, so that the navigating officer must have made the best of his time in getting in shore in the few minutes he was left to himself. The excuse on his part for nearing the shore was that he did so to steer clear of some fishing boats, and, from some error in judgment, he attempted to go inside instead of outside of them. The court passed sentence to the following effect:—"That having heard the circumstances of the case, as related by Lieut.

John Fellowes, having examined such of the officers and crew as were in a position to give evidence of value, and having deliberately considered the narrative of the officer in command and the evidence adduced, it was of opinion that her Majesty's steam-vessel *Psyche* was stranded through the default of the navigating sub-lieutenant, Alfred Burdett Scott, inasmuch as he without sufficient reason altered the course of the vessel so as to cause her to strike on the rocks off Port Molino, near Aci Reale, on the east coast of Sicily, on the 15th of December, 1870, thereby causing her total loss, and therefore adjudged Mr. Scott to be dismissed from her Majesty's service; and as the court was of opinion that Lieutenant Fellowes, although authorized to leave the bridge on important duty, had omitted to give sufficiently specific instructions for the navigation of the ship during his absence, and also neglected to station a leadsman in the chains, as ordered by the Admiralty Instructions, it severely reprimanded him, honourably acquitting the remaining officers and ship's company of the vessel. The court was further of opinion that after the ship struck, considering the circumstances of the case and the means available, all possible measures were taken for the recovery of the ship by Lieutenant Fellowes, the officers and crew of the *Psyche*, and the officers and ship's companies of those ships who were sent to assist her.' "—*Hants. Telegraph.*

THERE are many of our readers probably both in the Royal and merchant services, who are indebted for the knowledge they possess in navigation and mathematics generally, to the instruction they received in the school of Greenwich Hospital. Many of the "old boys" not only do credit to their instructors but are an ornament to the services in which they are engaged, and we are sure they will learn with a feeling of gratification, that on the changes which have recently taken place, and the consequent retirement of the Head Master, Dr. James Hill, a number of the gentlemen trained by him to be teachers, presented him with an address accompanied by a clock and a pair of vases.

This graceful recognition of his services has not been undeserved by Dr. Hill, when we state that from this class of pupil teachers eight are now Naval Instructors in the Royal Navy, one an assistant in the Royal Naval College at Portsmouth, eight are heads of institutions for teaching navigation; and also that the head masters, chaplains, and masters of the training ships *Conway* and *Worcester*, and of the Greenwich Hospital Schools, were pupils under him in the school.

We adverted in our last number to the circumstance that several gunboats of the *Staunch* class were in the course of construction. Two have just been completed by Messrs. Napier and Sons on the Clyde. They are short twin screw vessels, having twenty-six feet beam to only eighty-five feet length, and eight feet nine inches depth, they are consequently broad and flat. Each is 245 tons measurement. Towards the bow, which is very round, is a well, formed of iron plates, and seven feet deep; within the well is a moveable platform, which can be raised or lowered by screws. On the platform a ten inch eighteen ton gun will be mounted; the slides, with the platform elevated, will be flush with the deck, on which a continuation of the slides will be fixed on either side. The gun can be run out on these slides on either bow, and, after firing, it descends to the bottom of the well, where it is re-loaded, and the gunners are at the same time protected. When not in use the gun remains in the well, and thus keeps the centre of gravity low, which in bad weather is necessary. The platform screws are worked by a donkey engine, and the vessels are propelled by a pair of horizontal engines of twenty-eight horse-power.

A Strange life.—A Russian corvette, on a recent visit to the island of St. Christoval, one of the southernmost of the Solomon group, in the Pacific, met with an Englishman named Perry, who had settled there from Sydney for the purpose of collecting the produce of the islands to sell to the small craft that periodically call there. He had been tolerably successful in his trade, but from the fact of the natives being savages and cannibals, pure and simple, it may be conceived that a residence among them would not be without its perils. Perry, however, has managed to obtain a great influence over some of the chiefs, who had elaborately decorated him by tattooing, etc., by which decoration his person has been considered sacred. On the arrival of the corvette, Perry went on board, and was found most useful as an interpreter and mediator in trade and barter, which latter duty he performed to the satisfaction of both parties. The officers of the corvette left him with feelings of great respect and esteem for his daring and conciliatory qualities; and we shall be glad to record further information respecting the gallant fellow that can be furnished by any of our readers voyaging in those seas.

A strange fact—if true—comes to us from "round the Horn," and it would have been a stranger fact but a few years ago to state that it is taken from a Sandwich Island newspaper. It is, that one

of the whale-ships, then at Honolulu, had captured a whale within Behring Strait, which had in its carcase a harpoon known to belong to a ship at that time in search of whales in Davis Strait, in which case the whale must have accomplished that great desideratum,—the North-west Passage.

We regret to have to chronicle the death of Sir Luke Smithett. In speaking of his death, the "Dover Telegraph" says:—"Sir Luke was born in the year 1800, and commanded one of Her Majesty's packets on the Irish and Dover stations 1825-54. He was generally selected to pilot and accompany the Royal yacht, and to conduct Royal visitors to and from this country, the most notable among them being the Prince Consort on the 6th of February, 1840 (to be married to Her Majesty Queen Victoria), and their Majesties the Emperor and Empress of the French in April, 1855, on which occasion the Emperor conferred on him the Legion of Honour; was engaged at Calais in 1854, at the embarkation of the French army for the Baltic; is a Chevalier of the Order of Leopold of Belgium, and of the Order de la Gouronne, conferred on him by the Duke of Mecklenburg-Strelitz. He married, 1827, Jane, youngest daughter of Sir John Hamilton, who commanded the *Active* in Duncan's action off Camperdown on the 11th of October, 1797. He was knighted in 1862."

Mr. Samuel Plimsoll, M.P., in addressing a public meeting at Manchester, on the subject of the condition of our merchant seamen, stated that in the year 1866 the number of wrecks on our own coasts alone amounted to 2,131; and if this number was subdivided, it would be found that about half of it was represented by unseaworthy, overladen, and ill-found vessels of the collier class engaged in the coasting trade. The number of lives lost in the three years preceding that time was 3,053, and the loss therefore annually was 1,018. The Government, in their Report, stated these facts calmly and quietly, as if it were no concern of theirs, and yet he ventured to say that more than one-half of this loss of life might easily be prevented. Only some few years ago such a thing as insuring ships was unknown, but when ships came to be insured there was soon a great change. The result was that a large number of ships were going to sea at the present time which were utterly unseaworthy, and the large amount of shipwrecks which occurred every year was appalling. He was very glad to say that the shipowners, as a class, had done their duty nobly, for, whilst society and the Legislature had left them exposed

to dreadful temptation to wrong-doing, they had loaded and maintained their ships with regard to human life. It was only a miserable minority of the shipowners who were guilty of the practice of sending unseaworthy ships to sea. Their names were well known in the ports in which they lived; and there were in Liverpool at the present time a few men who went on 'Change, wearing broadcloth and fine linen, who more deserved to be hanged than any poor wretch who had suffered the extreme penalty of the law for the last ten years. In the last session of Parliament he had brought forward a measure with the view to compel unseaworthy ships to be inspected, repaired, and not allowed to go to sea overloaded. These were very simple demands, and he trusted in the next session of Parliament his measure would be carried. It would scarcely be believed that at the present time there was no legal power existing to stop a ship from going to sea however unseaworthy it might be. The people of the seaports had done their duty, and they now expected the inland towns to help them in putting down this damnable, manslaughtering, and widows-and-orphans-manufacturing system. Manchester was always foremost in endeavouring to improve the condition of the working classes, and he trusted it would also be foremost in seeking to improve the condition of our merchant seamen.

Guns versus Armour Plates.—The guns have it! When the *Warrior* was built not ten years ago, the armour plates placed on that ship were believed to be thick enough to resist any projectile that could be propelled against it. And it was so until a great gun was made that proved the contrary; and then the contest commenced; the armour plates became thicker and thicker, the guns grew larger and larger. But in order that our ships might float it was found necessary to have some limit to the thickness of the plates piled on their sides. Every means have been resorted to of economizing the weight on the parts of the ship, but all in vain, the thickest plates have to "cave in," before the last monster gun now in the course of being proved at the Woolwich Arsenal butts.

The thirty-five ton gun, propelling a bolt of 700 lbs. weight, has been tried with the enormous charge of 130 lbs. of pebble powder, producing an initial velocity of 1,348 feet per second, and that without perceptible strain or injury to the gun or its fittings. Before this the thickest armour plates on the thickest part that could be placed upon a ship would be penetrated at 1,000 yards, and compared with the ten-inch naval gun, the heaviest previously made, with its sixty lbs. charge of powder, where the latter would fail to

penetrate a plate close to it the former would pierce it at the distance of a mile.

The question will now arise, that as this thirty-five ton gun is a naval gun, and presumed to be for naval purposes, on what kind of ship will it be mounted? The idea of a broadside ship for such a gun seems preposterous. It will however involve the consideration of another contest that has been going on for some years, namely, Broadsides versus Turrets, and we confess for the purpose of using such "peacemakers" as the gun now under consideration, we believe that the Turrets will "have it."

THE pier at Herne Bay, which for a-long time has been in a ruinous and dangerous condition, is at length to be removed. The Official Liquidator of the Pier Company has sold the timber, etc., to a contractor who will shortly commence operations,—the piles are to be drawn, and anything like an obstruction to navigation removed. During the progress of the demolition a red light will mark the seaward extremity of the works.

A LETTER has been addressed to the Under-secretary of the Colonies, calling attention to the slave trade in the South Seas. It is signed by Lord Alfred Churchill, Sir T. Fowell Buxton, four members of the House of Commons, and the secretary of the Aborigines Protection Society. They are satisfied that "the trade in Polynesians requires to be very firmly dealt with by her Majesty's Government." They print a letter from Mr. Robert Short, of Melbourne, in which that gentleman says that at Fiji the trade in human beings "is carried on now on a scale of unprecedented magnitude, accompanied by circumstances of great atrocity."

SENOR CASTILLO, of Saragossa, whose prophecy as to a severe winter has to some extent already been fulfilled, predicts a return of frost and snow, with a continuance of Polar winds and very rough seas.

WE are requested to draw attention to the following Errata in our December number:—p. 693, line 16 from foot, for "most occasioned" read "most probably occasioned;" p. 694, line 5 from top, for "Taboucai" read "Tabouai;" p. 694, line 14 from foot, omit the word "by."

THE

NAUTICAL MAGAZINE.

NEW SERIES.

MARCH, 1871.

MERCHANT SHIPPING LEGISLATION.—III.

BRITISH SHIPS AND BRITISH SEAMEN.

In the present article, we propose to trace the gradual emancipation of the British mercantile marine from the fetters of State nursing; from a system of so-called protection, to freedom. It is necessary to do this in order to discover why it was that laws which excluded foreigners from service in British ships, and other laws now obsolete, restricting British and colonial trade in foreign ships and restricting the manning of our own mercantile marine, were once possible, and why they are possible no longer. We shall endeavour to indicate the value of the changes gradually brought about; changes by which our national merchant ships from having been in our early history exclusively built in England, owned in England, manned in England, and sailed to and from England,—are in the present age not unfrequently built abroad, owned abroad, commanded and officered by foreigners, manned by foreigners, and employed on voyages that never bring them to Great Britain. We shall suggest that as the strength and safety of her Majesty's dominions depend on our mercantile marine, some further steps are necessary to raise its character, and to bring the élite of its seamen into a more complete union with the seamen of the Royal Navy, in order that the former may effectively co-operate with the latter in time of war. Our subject commences with a consideration of the so-called

Early Navigation Laws.

From the early days of our monarchy, seamen or shipmen * as they were called of old, have been regarded by the State as subjects whose services and peculiar avocation rendered them especially valuable in time of national emergencies; and we find that important measures were in the earliest times adopted by the ruler or the parliament to increase their numbers. We need not for present purposes however go back further than the reign of Henry VII., a period during which the value of shipmen and the necessity for parliamentary action, with a view to increasing our naval strength, had become specially apparent.

As there was not at that time, nor until centuries after, any large standing naval organization (like our Royal Navy of to-day), fighting shipmen, and the ships to carry them, had to be obtained from the mercantile marine as necessity arose for their services, and the officers placed in command were generally officers distinguished by their military services on shore. On reference to the old "Navigation Laws," we find that the spirit pervading them is, that the production and maintenance of shipmen is necessary for the security of the State. This was true then, is true now, and will remain true to the end of our existence as a nation. If in order to obtain shipmen for the purpose of the State in early days it was impossible not to do something to encourage commerce, so much the better for commerce; but the one prevailing idea was that a national merchant navy must be maintained, because the shipmen as well as the ships were wanted by the Sovereign in time of war. In order that English ships and shipmen should abound, employment had to be found for them; and in order to find employment for them, foreign ships and foreign shipmen had to be kept away.

Prior to the time of Henry VII. there had been "Navigation Laws," all conceived in the most thorough-going spirit of en-

* "A schipman was there - - -
* * * *
"Of his craft to rickne wel the tydes,
His stremes and his dangers him besides,
His herburgh and and his mone, his lodemenage,
There was none such from Hulle to Cartage,
Hardy he was, and wys to undertake;
With many a tempest hadde his berd ben schake.
He knew well alle the havens, as thei were,
From Scotland to ye Cape Fynestere,
And every cryke in Bretayne and Spayne,
His barge y-clepud was the 'Magdelayne.'"
Chaucer. Prologue to Canterbury Tales.

couragement, and protection (we should now call it restriction); and all aiming at the same thing, viz., the increase of ships and shipmen who could when wanted be found and used for purposes of defence and attack. Looking to the spirit and necessities of the times it is no matter of surprise to find that this was the case, nor to find that the two great principles embodied in the Act of Henry VII. were, (1) the exclusive manning of English ships by English shipmen, and (2) the prohibiting of foreign ships, as far as possible, from importing goods into England; nor is it a matter of surprise to find that the Act of Elizabeth excluded foreigners from our fishing grounds,* and coasting trade.

Cromwell's Act of Navigation.

Cromwell in 1650, desiring to ruin the Dutch mercantile marine, then the chief carriers and our most formidable rivals at sea, and at the same time to encourage the growth of our own mercantile marine, obtained the passing of the so-called "Act of Navigation." In order to effect the desired end that Act provided that no goods or commodities whatever of the growth, production, or manufacture of Asia, Africa, or America, could be imported either into England or Ireland, or any of the "plantations" (Colonies) except in English ships, chiefly manned by English seamen. And a similar clause was adopted as regards the produce of Europe, excepting that ships of the country in which the articles were produced or grown might bring them here as well as British ships. Nothing could be sent to or from the Colonies unless it passed through Great Britain. The Dutch were carriers and not producers, and as our Navigation Laws prevented them from bringing to us or carrying to our Colonies the productions of other countries, and from carrying to other countries our productions, the manner in which the Act of Navigation would operate against the Dutch can easily be understood. Adam Smith in his work on the "Wealth of Nations" fully recognized the fact that the Act of Navigation was conceived with a view to military necessity rather than commercial advantage. He points out with reference to the Navigation Laws that by diminishing the number of sellers we necessarily diminish that of buyers, and we are thus likely not only to buy foreign goods dearer, but to sell our own cheaper than if there were a perfect freedom of trade; but he goes on to say, "As defence however is of much more importance than opulence,

* The exclusion of foreigners from our fishing grounds is now (1871) the only remnant of these restrictive laws.—Ed.

the Act of Navigation is, perhaps the wisest of all the Commercial Regulations of England." Although we could not look upon it as a wise law now, the Act of Navigation remained the law of the British Empire (with the exception of a few modern modifications, chiefly in favour of ships of the United States) from 1650 until 1826.

Of one fact there can be no doubt, viz., that in the end the mercantile marine of the Dutch did fall away, and that the falling away happened after the passing of our Act of Navigation. Some writers believe that the Act of Navigation brought this state of things about, we however in common with some other writers, believe that the Act of Navigation had but little to do with the decline of Dutch commerce. That Act may possibly to some extent have assisted; but that Act alone could never of itself have brought about so important a change. The change would have come about whether that Act had been passed or not. It is as monstrous to believe that the only employment open to foreign ships was trade with this country, as it is to believe that the British Act of Navigation brought about such a convulsion of the commercial relations of the whole world as to ruin the most prosperous mercantile navy then in existence. To believe all this we must also believe that the parliament of Britain governed the whole world. If the Dutch had attended to their real interests instead of getting mixed up in ruinous wars, their mercantile marine would not have suffered as it did. Yet as after the passing of our navigation laws the commerce of our rivals eventually decreased, those who knew of our Act of Navigation, and did not know of, or did not appreciate the other causes contributing to the decay of the commerce of our rivals, naturally enough attributed the change to our Act of Navigation, and not to the other and the real causes. The chief causes of the decline of the commerce of the Dutch were the heavy taxes imposed by themselves on their own ships, and on goods carried in ships, taxes imposed with a view to meeting the expenses of contests in which their republic were involved with Cromwell, with Charles the Second, and with Louis the Fourteenth.

It was not until long after the passing of Cromwell's Act of Navigation, nor until these heavy taxes had been for a time imposed on Dutch ships that their mercantile marine dwindled away. Nor do some thinkers believe that our Act of Navigation was really the means of increasing our own trade, as many persons have believed and still believe; for Roger Coke (1671) says, that within two years after the passing of the Act of Navigation, "we had lost the greater part of the Baltic and Greenland Trades," and another

writer stated that English shipping in those trades had decreased at least two-thirds, while foreign shipping had proportionally increased. In the course of time, our foreign commerce did undoubtedly increase; and our restrictions on foreigners continued to be maintained. Our increase was not because of the Act of Navigation, but in spite of it. Other countries thinking that our Act of Navigation had contributed to our success, adopted similar Acts themselves, and in the spirit which had led us to strike a blow at Dutch trade, endeavoured in return to strike a blow at ours. In an article on the Navigation Laws in McCullock's Dictionary, 1854, the following passage occurs, viz.: "Instead of ascribing our commercial and manufacturing superiority to its true causes, that is, to the comparative freedom of our constitution, the absence of oppressive feudal privileges, the security of property, and to the fairness of our system of taxation; our foreign rivals contended that it had been exclusively owing to our exclusive system, and appealed to our example to stimulate their respective governments to adopt retaliatory measures, and protect them against British competition." The United States really did adopt our navigation laws, and several countries in Europe threatened to do the same; but this was chiefly prevented by the reforms introduced by Huskisson in 1825. Before then, however, we had been obliged to give in to the United States by allowing their ships certain privileges, especially as regarded trade with our colonies, and by adopting a system of reciprocity.

Huskisson's Navigation Law.

On the 5th of January, 1826, Huskisson's Navigation Act became law. In introducing his Bill, Mr. Huskisson made a lucid statement of the then state of the navigation laws. The passages in this speech having immediate reference to the point we are considering are of immense interest at the present time. They are as follows, viz.:—"It must be well known to every gentleman who hears me, that the long established policy of all the European powers possessing colonies in the New World, and of this country among the rest, was that of an entire and rigid exclusion of those colonies from our commercial intercourse, except with the Mother Country. To uphold this exclusion, and to forbid all such intercourse seemed of the very essence of colonization. In the strict and even inhospitable enforcement of this principle, Spain, with the largest colonial possessions in the world, showed herself most determined, and, if I may use the expression, most exclusive. But, without being equally jealous, other powers were not less

tenacious of the principle. I cannot give a stronger proof of this, than by reminding the Committee, that this exclusive intercourse was held to be a part of the international law of Europe. * * * In our Prize Courts it has been commonly referred to, and was acted upon, as the rule of the 'seven years' War.' Under this rule the colony of a belligerent could not claim to carry on trade through the intervention of a neutral, because that neutral was not permitted to participate in such trade in time of peace." After explaining the mode in which the permission given to the United States to trade in their own ships with our colonies had been received by the government of that country, Mr. Huskisson went on to "ask the Committee, independently of all general considerations, why are we to refuse the like indulgence to the ships of European States? Are we more jealous of the navigation of Denmark, Sweden, Russia, Holland, or the Hans Towns, than of that of the United States? Are we anxious to promote the one at the expense of repressing the other? Is it fair or politic to grant to the one what we withhold from the other? I think that every man who understands the political interests of England as connected with the maintenance of the naval power, must be satisfied that this cannot be a wise policy. I am prepared to open the commerce of our colonies to all friendly States, upon the same principles (though, of course, with some difference in the detail of its modifications) upon which they are at liberty to trade with Jersey or with Ireland. With the exception of some articles which it will be necessary to prohibit, such as fire-arms and ammunition of war generally, and sugar, rum, etc., in the sugar colonies, I propose to admit a free intercourse between all our colonies and other countries, either in British ships, or in the ships of those countries, allowing the latter to import all articles, the growth, or manufacture of the country to which the ship belongs, and to export from such colonies all articles whatever, of their growth, produce, or manufacture, either to the country from which such ship came, or to any other part of the world,—the United Kingdom and all its dependencies excepted. *All intercourse between the Mother Country and the colonies whether direct or circuitous, and all intercourse of the colonies with each other, will be considered as a coasting trade, to be reserved entirely and absolutely to ourselves.* By this arrangement the foundation of our navigation laws will be preserved, whilst the colonies will enjoy a free trade with foreign countries, without breaking in upon the great principle of those laws. In respect to foreign trade—that the cargo must be the produce of the country to which the ship belongs, leaving the national character of the ship to be determined by the rules which

apply in like cases to this country. The importation of foreign goods into the colonies, I propose should be made subject to moderate duties, but such as may be found sufficient for the fair protection of our own productions of the like nature."

The clauses embodying these views were in substance as follows:

1. "Enumerated articles," the produce of Europe could only be imported into the United Kingdom in British ships, or in ships of the country in which they were produced.

2. The produce of Asia, Africa, and America could not be imported from Europe into the United Kingdom for use therein (certain exceptions were allowed).

3. The produce of Asia, Africa, and America could not be imported into the United Kingdom for use therein except in British ships, or ships of the country producing the article (certain exceptions were allowed).

4. No goods could be conveyed from the Channel Islands or the Colonies to the United Kingdom, or *vice versâ*, or from one colony to another, except in British ships.

5. No goods could be carried coastwise except in British ships.

6. No goods could be imported into British Colonies except in British ships, or ships of the country producing the article.

These provisions remained in force from 1826 to 1850. They were regarded as stupendous innovations by Huskisson's opponents; but it may be open to speculation whether, if he had had his own way, Huskisson would not even then have gone further than he did in the direction of free trade. Looking back on the law of 1826, from the altered circumstances of the present day, one is almost inclined to think that the measure of relief then afforded, though great, was insufficient; so easy is it to be wise after the fact. If we had lived at that time, we should no doubt have regarded the alteration as a tremendous innovation; now we are inclined to wonder how, even with Huskisson's measure of relief, it was possible for commerce to make the advances she did. Although Huskisson's law remained unrepealed until 1850, it was necessary to supplement it by other provisions, for that which had been regarded as liberality in 1826 had, in fact, become to be regarded as protection, verging on to prohibition, a few years later. As the people were not then prepared for the great, honest, straightforward measures of free trade to which they have now become accustomed, commerce had to be extended by measures which, whilst apparently upholding the old system, in reality circumvented and undermined it. Notwithstanding the freedom given by Huskisson's laws for foreigners to enter into our trade, it had been one of our funda-

mental principles to encourage British ships at the expense of foreigners, by charging additional duties on produce brought to this country by foreign ships. It was believed that unless this were done foreign ships would get the best of the trade over us. It was alleged that foreign seamen could be fed on a diet that British seamen would starve upon, and the wages of foreigners were certainly less than those of British seamen. An eminent shipowner on one occasion, whilst reforms were under consideration, worked on the feelings of his audience by distributing amongst them black bread, as a sample of the stuff on which foreign seamen lived. In order that British ships and seamen might be protected, British consumers were prevented by these differential dues from reaping the full advantages that might arise from cheapness of carriage by foreigners. These differential dues might have been all very well if we had had everything our own way, but as we had not everything our own way they were the reverse of good.

Foreigners soon imposed heavy duties on goods taken to their countries in our ships. The United States for instance had, before Huskisson's reform, imposed nearly a dollar a ton duty on the amount paid by British ships over their own ships, in addition to ten per cent. extra on goods carried in our ships over goods carried in theirs. We, of course, might have gone on retaliating, and they might have gone on retaliating to any extent, but such a system would have been the height of folly, and we had to meet it by a compromise. We had some years before Huskisson's reform, agreed with the United States that equal duties should be charged on the ships of, and on the goods carried in ships to or from, either country by ships of the other. This was our first reciprocity treaty, and this treaty had soon to be adopted in our commercial transactions with other countries besides the United States. We kept the principles of Huskisson's law in our statute-book, and also the right of imposing extra dues on foreign ships, but we were obliged to set that right aside by treaties, not then as a voluntary act, but as an act of self-preservation.

Repeal of Navigation Laws.

In the year 1850 the tonnage of the British Empire had increased by a million and a half of tons over the tonnage of 1825; and in 1849 Huskisson's law was repealed, and in substitution for it an Act was passed which opened all our trade to foreigners, excepting—

(1). The British Coasting Trade.

(2). The trade between the Channel Islands, and between the Channel Islands and Great Britain.

(3). The trade between one part of a British Possession and another part of the same Possession.

Two colonies might under this Act combine together as one Possession, and declare that the trade between them should be treated as a coasting trade, and when they thus combined foreign ships were of course shut out, as from the coasting trade of any one Possession.

In 1854 the Coasting Trade of the United Kingdom was thrown open; and in 1869 an Act was passed enabling each colony to regulate its own coasting trade by Act or Ordinance, subject to the conditions that—

(1). Her Majesty approve the Ordinance.

(2). All British ships be treated alike.

(3). When her Majesty's Government have granted foreign ships rights or privileges in the coasting trade of any possession, those rights or privileges shall be preserved. But as regards dues and impositions levied on British ships, and on goods carried to foreign countries in British ships, the following rights are reserved by the Act 16 and 17 Vic. cap. 107 sec. 324, viz.:—"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." Although this power of levying higher dues on foreign ships in certain cases is wisely retained, it does not follow that it is always wise to act on it. On the contrary, it has been urged that we should shew our faith in freedom in all its shapes, by disregarding restrictions placed by foreigners on our ships. This is undoubtedly a sound view, and if acted on is likely to be of more value in the end than any other course we could adopt.

Legislation since repeal of Navigation Laws.

Before and pending the repeal of the Navigation Laws completed in 1849, complaints were made—

1. Of incompetency of officers.

2. Of want of discipline, etc., amongst seamen.

3. Of passing tolls, town dues, charity dues, compulsory pilotage, and other local charges on shipping.

4. Of liability of shipowners under Lord Campbell's Act.

5. Of timber duties.

6. Of want of reciprocity.

7. Of merchant seamen's fund.

8. Complaints have also been, and are still made of want of local jurisdiction.

In 1849 Mr. Labouchere obtained the passing of an Act, 12 and 13 Vic. cap. 88, to amend the Laws relating to pilotage, by which pilotage authorities were enabled to examine masters and mates, and to give them, if found competent, certificates exempting them from compulsory pilotage.

In 1850 Mr. Labouchere obtained the passing of the first Mercantile Marine Act, 13 and 14 Vic. cap. 93, by which were first established—

1. Examinations for masters and mates.

2. Shipping offices.

3. Inquiries into wrecks and misconduct.

4. A more stringent system of discipline, including summary jurisdiction.

5. Naval courts abroad.

Mr. Labouchere also obtained from the Trinity House, a large reduction of the light dues on coasters.

In 1851 Mr. Labouchere obtained the passing of a Steam Navigation Act, 14 and 15 Vic. cap. 79, making the survey of passenger steamers more stringent and containing rules concerning collisions, boats, etc. Also an Act, 14 and 15 Vic. cap. 102, for winding up the Merchant Seamen's Fund.

Mr. Cardwell obtained the passing of the following Acts in 1853. An Act, 16 and 17 Vic. cap. 129, enabling the Board of Trade to grant certificates of exemption from compulsory pilotage where pilotage authorities refused to do so, and placing Cinque Ports pilots under the Trinity House.

And an Act, 16 and 17 Vic. cap. 131, constituting the Mercantile Marine Fund, putting an end to Trinity House Pensions, and subjecting the lighthouse expenditure to the control of the Board of Trade.

In 1853-4 the management of colonial lights was transferred from the Admiralty to the Board of Trade.

In 1854 Mr. Cardwell obtained the passing of an Act, 17 and 18 Vic. cap. 5, opening the coasting trade of the United Kingdom to foreign ships.

He also issued the commission on local charges on shipping, which reported in 1854-5.

In the same year Mr. Cardwell obtained the passing of the present Merchant Shipping Act, 17 and 18 Vic. cap. 104, by which all the Acts relating to merchant ships were consolidated except those relating—

1. To customs duties.
2. To emigrant ships.
3. To harbours.

The chief new features in this Act, besides innumerable smaller amendments were—

a. Complete revision of ship registry.

b. New system of measuring tonnage.

c. Complete revision of the law relating to wrecks, including summary jurisdiction in salvage cases.

d. Limitation of shipowner's liability.

In 1855 was passed the Merchant Shipping Act Amendment Act, 1855, 18 and 19 Vic. cap. 91, extending the system of building lights by passing tolls to the colonies, with other amendments.

In 1856 Mr. Lowe brought in a Bill for carrying out the recommendations of the commission on local charges on shipping. The Bill was referred to a Select Committee, practically on the Liverpool case, which ended in 1857 with a private Bill, by which the Liverpool Town dues were handed over to a newly constituted harbour trust at ten years' purchase.

In the same year, 1856, an Act, 19 and 20 Vic. cap. 41, was passed enabling the Board of Trade to establish seamen's savings' banks, which with a system of money orders for seamen are worked through the shipping offices.

In 1859 the Royal Commission on harbours of refuge reported, and the Board of Trade made a counter report, which was successful.

In 1860 Mr. Lindsay's Committee on Merchant Shipping reported.

In the same year came the French Treaty, which has been followed up by liberal treatment of British ships in French ports.

In 1861 the Commission on Lighthouses reported. Very little came of it. The same year Mr. Milner Gibson carried through the Harbours and Passing Tolls Act, 1861, 24 and 25 Vic. cap. 47, effecting the following objects—

1. Loans by Public Works Loan Commissioners to Public Harbours in lieu of the sweeping grants recommended by Harbours of Refuge Commission.

2. Abolition of passing tolls.

3. Abolition of local differential charges on foreign ships, and of compensation there for.

4. Abolition of charitable charges on ships.

An Act, 24 and 25 Vic. cap. 45, was also passed enabling the Board of Trade to make provisional orders concerning harbours. This Act was amended in 1862 by the 25 Vic. cap. 19.

In 1862 Mr. Milner Gibson carried the Merchant Shipping Act Amendment Act, 1862, 25 and 26 Vic. cap. 63. The chief features were—

1. Extension of examination to engineers.

2. Revision of inquiries into misconduct, etc.

3. Establishment of rules previously agreed on between England and France for a system of lights to be carried, and precautions to be used to prevent collisions at sea.

These rules have now become the Law of the World.

4. Inspection of local lights.

5. Small relaxations of the law of compulsory pilotage.

6. Power to make arrangements with foreign nations for a common tonnage measurement.

7. Reduction of owner's liability.

8. Summary jurisdiction in salvage cases extended.

An Act, 25 and 26 Vic. cap. 69, was also passed, transferring from the Admiralty to the Board of Trade the jurisdiction exercised by the former for preventing injury to navigation: and the management of the harbours of Holyhead and Portpatrick. The harbours of Dover and Alderney were added in 1865 by the Act 28 and 29 Vic. cap. 100.

About this time the arrangements for a new commercial code of signals—first devised by a Committee appointed by the Board of Trade in 1855—began to come into use. It has since been adopted by most foreign nations, and translated into most European languages. And it now constitutes one universal maritime language. A uniform code of harbour and tidal signals, of pilotage signals, and of signals of distress, is now very fairly underweigh.

In 1864 Mr. J. Laird and Sir J. Elphinstone carried the Act 27 and 28 Vic. cap. 27, for testing anchors and chain cables.

In 1866 was passed the Crown Lands Act, 1866, 29 and 30 Vic. cap. 62, transferring the foreshores from the Office of Woods to the Board of Trade.

The same year the timber duties were repealed.

In 1867 was passed the Local Dues Exemption Act, 30 and 31 Vic. cap. 15, putting an end to exemptions on the ground of residence, freemanship, etc.

In 1867 an Act, 30 and 31 Vic. cap. 124, was also passed (the Duke of Richmond's Act) providing—

1. More space for crews.
2. Proper lime juice.

In 1868 was passed Mr. Norwood's Bill, 31 and 32 Vic. cap. 71, giving County Courts local Admiralty jurisdiction.

In 1869 was passed the Merchant Shipping (Colonial) Act, 1869, 32 and 33 Vic. cap. 11—

1. Repealing the restrictions on the coasting trade of the colonies.
2. Providing for certificates of masters, mates, and engineers in the colonies.

There has hardly been a year without legislation about merchant shipping, and of all the grievances complained of at the time of replacing the Navigation Laws by Mr. Huskisson, there is scarcely one—if one—which has not been dealt with.

In addition, the Naval Reserve, which will be specially referred to further on, has been established, with advantage both to the country and to merchant seamen.

We have now briefly and incompletely, but sufficiently for our present purposes, indicated the chief points in our progress towards a system of absolute freedom of communication with foreign countries by sea; and were it within the object of the present paper to consider the advantages reaped by the country from unencumbered trade, a whole number of the *Nautical Magazine* might be filled, with but scant justice to the importance of so wide an investigation. It would be edifying to trace step by step the removals of each restriction on shipping, with the ever attendant increase in trade,—showing how the shipping interest of Great Britain, which was thought by some to be threatened with immediate ruin by the removal of each restriction, is thought by some to be undergoing the process of ruination still,—how that the tonnage of the Empire in 1825, of 2,553,682 tons, has increased to 7,185,430 tons, and how that, in addition to this tonnage for ourselves, we have built in the last eleven years 300,000 tons for foreign owners. Our object is, however, not now to enlarge upon the advantages of unrestricted trade, but to consider another point, viz., the manning of the British mercantile marine, and to enquire how far perfect freedom, as regards the manning and navigating of our ships, is consistent with the maintenance of reserves of British seamen. In our necessarily rapid survey of the Navigation Laws, we have as yet only looked at them as they have affected the carriage of goods, and the communication between this country and foreign countries, and foreign

countries and the colonies; we must now look at them as affecting the manning of British ships.

Laws as to Manning.

Forty-six years ago, that is to say in 1825 (the year of Huskisson's reform), the total number of British ships appearing on the Register was 24,280, with a tonnage of 2,553,682 tons, and with crews numbering 166,123 hands.

The returns of these early years were however inaccurate. It happened that ships appeared on the Register as British ships for years after they were lost, or sold to foreigners, or broken up; and thus the figures both of ships and men were as given in the returns in excess of the number of British ships in existence, and of men serving on board ships. It is probable that in 1821, there were entered in the returns about 16,000 men and a proportionate tonnage in excess of the reality. We must therefore bear in mind that the total number of persons serving in British ships was in 1825 not 166,183, but probably about 150,183, and that *the number of British ships registered out of Europe was about* 3,000 *in all.* At the present moment the entire number of persons serving on board British ships is estimated at 335,848, and the number of British ships registered out of the United Kingdom is 12,928 ships, of 1,462,760 tons, with 87,000 hands.

Our first laws as to manning applied to English ships—they were required to be manned and owned by Englishmen. This was then an easy matter, we had no colonies, and all were English together. Now, however, the case is different. Our first Law as regards manning required that the whole crew should be English (British) subjects, this was afterwards relaxed to three-fourths of the crew, and then to the greater part of the crew, and eventually provision was made whereby foreigners serving on British ships, became legally after a time British seamen. Still as the spirit of the times became more liberal, and as trade was opened out, the manning of British ships by British seamen became more difficult. In 1835, two courses were open; either all restrictions as to foreigners serving on board British ships must be removed, or means would have to be taken to provide more British seamen. The latter course was adopted, and an Act was passed with a view to increasing the number of British seamen. To effect this object some boys were to be encouraged to enter themselves as apprentices to the sea service, and others were to be compelled to do so. This Act, the 5 and 6 William IV., is pervaded with the spirit of former Acts,

viz., the necessity for increasing the number of British seamen for the benefit of the State.

The points now worthy of note in that Act are, (1) The establishment of the apprenticeship system; (2) The driving into the mercantile marine of parish (pauper) apprentices, and (3) The establishment of a registry office for seamen. In the first year of its operation 5,420 apprentices were bound to the sea service, and the binding of apprentices continued for many years, at the rate of about 5,000 to 6,000 a year. This was soon found not to be enough to keep up the desired supply of British seamen. It again became apparent that foreigners must be let in unless our own seamen increased in numbers; and in 1844, an Act was passed which compelled British merchant ships to carry apprentices according to their tonnage, and established a register ticket for British seamen. The apprentices immediately increased (on paper), from 6,259 bound in the year 1844 to 15,704 bound in the year 1845. Whether these were chiefly the parish boys or not does not now appear. The total number of apprentices on the register in 1845 was 30,132. The Compulsory Apprenticeship Law was not however a successful piece of legislation. Many owners and masters evaded it, got "dummy" apprentices, landed their apprentices after sailing, or forced them to desert abroad. Those owners who complied with it found that they were keeping up apprentices and training seamen for those owners who evaded it; complaints were made as to the hardships of an owner having to maintain more apprentices than were necessary for any ship, and arguments were brought forward to shew that foreign seamen, especially Danes, Norwegians, and Germans, were often equal to British in their seamanship, and greatly superior to them in discipline and obedience. All the time during which these points were being discussed the mercantile marine was expanding. Steam was beginning to hold its own, some of our British seamen were becoming colonists and leaving the sea service. Still we were adhering to the old law as to manning and trusting to compulsory apprenticeships and pauper apprentices for our supply of seamen. By the year 1849 it was found that the compulsory apprenticeship law was a bad law, that it was a failure, and that it was justified by no mercantile necessity, and in that year it was repealed. So great was the increase in trade that in the year 1853, the subject of manning merchant ships again had to be considered, and it was then decided that if trade were to go on in British ships, and if the numbers of British ships were to be allowed to increase, all restrictions as to manning them must be removed, and in that year the clause was repealed which required the master and any member

of the crew of a British ship to be a British subject. Under the Act of 1844, a ticket called a register ticket had been introduced. It was intended that each British seaman should carry about with him his ticket and his number. We all know how easy it is to label and keep a label on bundles of papers or gallipots, or fossils, or beetles, or policemen, on any object that can be put on a shelf or in a pigeon-hole, or in a case, or kept in a comparatively small area; but to keep a ticket and a number with each British seaman is another business. It was soon found to be a hopeless task and an utter failure, and in the year 1853 the register ticket was abolished by a letter signed by Mr. T. H. Farrer, the permanent Secretary to the Board of Trade. The year 1853 was the year of perfect freedom as regards manning, and from that date forwards no restrictions whatever have existed as to the number, nationality, or rating of the hands to be employed on board British merchant ships other than the number of certificated officers to be employed, and even they need not be British.

The present strength of the mercantile navy of the British empire is shewn in the following line:

Total: ships, 39,087; tons 7,185,430; men, 335,848.

The strength of so much of our mercantile navy as is registered in the United Kingdom is—

	Ships.	Tons.	Men. British.	Men. Foreign.	Men. Total.
Sailing,	24,187	4,765,301	228,596	20,362	248,958
Steam,	2,972	948,367			
Total,	27,159	5,713,671			

The extent to which the prosperity of the country is indebted to this enormous body of merchant seamen in time of peace cannot be over estimated, but there are also other bodies of men besides those who man our merchant ships who also contribute to the prosperity of the country. Take for instance coal miners, miners and workers in metals, cotton spinners, woollen cloth manufacturers, masons, bricklayers, carpenters, and numerous other bodies or classes of workers. No one ever dreams of preventing by law a foreigner from working ashore in a British factory in any of the ordinary trades or occupations, why, then, should the law attempt to prevent foreigners from working afloat in British merchant ships, especially when we bear in mind that the sailor is not the producer, but the carrier only of what other workers produce. It does not matter either to the producer or consumer whether a bale of cotton goods, or a locomotive engine manufactured here is carried to the consumer by a ship manned or owned by foreigners, unless

indeed the cost of carriage is affected. As far as trade alone is concerned therefore, it is immaterial (provided the seller and buyer can command the means of transport) whether these means are of British or of foreign origin and ownership, or are worked by British or by foreign seamen.

As the strength and safety of her Majesty's dominions are admitted on all hands to be dependent on a supply of British merchant seamen, then that strength and safety must depend on something altogether beyond, and distinct from the exclusive employment of British merchant seamen, engineers, stokers, and firemen as carriers of produce. In short, the strength and safety of her Majesty's dominions, as they do undoubtedly depend on the British seaman, chiefly depend on him in so far as he can be regarded beyond other classes of men as an element of strength in time of national danger. A very large proportion of the seamen of the British mercantile marine, besides foreigners would be of no use as fighting men even then, for in the first place an immense number of seamen have not the *physique* necessary to enable them to work the present heavy guns and heavy gear, and in the second place those who have the *physique* and have not training are of but little value, and besides this, even if all were fit for the Royal Navy some must be left in the merchant service in time of war to carry on our trade. The time has gone by when mere numbers alone were supposed to represent strength at sea. What we now want "for the strength and safety of this United Kingdom in time of war," is a sufficient number of selected British seamen trained to the use of guns and arms, on whose services we can depend as a reserve in time of danger. As regards the rest of the seamen of our merchant fleet it matters but little to the safety of the State, so far as that safety depends on fighting men, whether they are trained to the use of arms or not, or whether twelve per cent. of them are foreigners, or whether they are able or ordinary seamen, engineers, firemen, or stokers; for if sufficient selected men are entered in the reserve and if the carrying trade is supplied with seamen, stokers, firemen, etc., of the quality and of the number it requires whose service can never be wanted in the Royal Navy, what can be the necessity for any interference by law with the manning of the British merchant service.

Apart however, from the mere commercial operation of carrying of goods, an operation which as we have shewn can be just as well conducted in foreign as in English bottoms; and apart from the necessity for training reserves for the Royal Navy, there is a reason and a most important reason why the British merchant service

should contain a sufficient supply of British merchant seamen, viz., that the mercantile marine is the carrier of food for the country. In time of peace all goes on well, we get our supplies regularly in British and foreign bottoms, but, unless we are careful, our supplies of food may be cut off in times of national emergencies, unless we have far more British subjects in the mercantile marine than can ever be required for the Royal Navy. This is a consideration that becomes of more importance every day. We cannot produce in our own small islands all the bare necessaries of life for our present population. It is not only for the transport of such articles of consumption as tea, coffee, sugar, etc., that we are dependent on our mercantile marine, but also to a great extent for our bread and meat; merchant ships not only keep us supplied with tea, sugar, and coffee, and a variety of articles taking rank between necessaries and luxuries, but they also keep us supplied with large quantities of the corn, wheat, cheese, rice, eggs, beef, mutton, and pork, and nearly all the fish that we consume, as well as with no insignificant part of the oil cakes, grain, seeds, etc., on which we fatten some of the limited supply of cattle we are able to raise. On this point the following table, shewing the imports of some kinds of food twenty and thirty years back, and in 1869 and 1870, is at once instructive and startling.

	1842.	1853.	1869.	1870.*
Horned Cattle.....No.	4,264	125,253	220,190	189,622
Sheep and Lambs, „	644	259,420	709,843	634,083
Bacon and Hams,cwts.	8,355	205,667	740,193	487,310
Butter ..... „	175,197	403,289	1,259,089	1,013,866
Eggs .....No.	89,548,747	123,450,671	442,172,640	411,033,480
Rice (not in the husk) .....cwts.	511,414	1,504,629	5,319,504	3,303,955

Every day that our national existence is prolonged, do we become less able to support ourselves by the produce of our own lands. Every day is our population increasing, and every day are we extending our manufactories and increasing the disproportion between the consumers of food and the producers. On the one hand more mouths are daily coming into existence and consequently more food is required, and on the other hand, with this necessity for more food, we are steadily decreasing our means of producing it in our own country, for we are covering our land with workshops and houses, or are otherwise rendering parts of it unfit

* Eleven months only.

for cultivation. If our strength at sea is neglected, if we allow the proportion of foreign seamen in British ships to increase greatly beyond the present limit of twelve per cent., a state of things may without doubt arise under which our supplies from abroad could no longer reach us. How great then is the truth that the "security of the Empire of this our United Kingdom" depends on our supply of British seamen; and how stupendous must be the folly of a people who fail to recognize this truth, or having recognized it quietly go on amassing riches without making provision for national existence.

Royal Naval Reserve.

Early in 1859 the report of the Royal Commissioners for manning the Navy, was presented to both Houses of Parliament, by command of her Majesty. That report recommended, that in addition to men actually serving in the Royal Navy there should be kept up "Standing Reserves" of marines, coast guard, naval coast volunteers, and short service pensioners. The Commissioners did not however think that even these "Standing Reserves" were sufficient, and recommended in addition a volunteer reserve force of merchant seamen of 30,000 men.

The Commissioners say:—

"Looking to the very large naval armaments which we were forced to maintain in former wars, amounting at one time to no less than 147,000 men, it seems desirable that we should be able *to add to the reserves of which we have spoken*, a further force of from 20,000 to 30,000 seamen well trained in gunnery. The problem to be solved is, how far it may be possible to obtain from the mercantile marine and the seafaring population of the kingdom a volunteer force of seamen, all trained in gunnery, who could be relied upon to come forward when their services were required."

The Commissioners stated that:—

"The force we require must be composed of trained seamen, and as the necessity for such a reserve is urgent, it must, *in the first instance*, be recruited from adults. But the enlistment of adults by pay and pension is in many respects undesirable; for the adults have not had the advantage of early training, and are consequently not such valuable men, as those who have been trained from boyhood; and the pension, if only commensurate in amount to a short period of service would not be adequate to the support of the seaman in his old age. Your Majesty will therefore perceive that for the future maintenance of the force, *we propose to rely in a great measure on boys trained specially for the purpose*, in conformity with

the practice which has been adopted in the Navy with so much advantage."

The Commission go on to recommend that in the first instance, and as a temporary measure, 20,000 men shall be selected from the merchant service, and enrolled to begin with, but as regards future supply, "school ships should be established in the principal commercial ports, capable of accommodating from one to two hundred boarders in each ship, of whom one hundred should be supported by the State."

Speaking of school ships (exclusively for the mercantile marine), the Commissioners go on to say, that "in all 2,400 boys would be supplied annually by these school ships to the maritime occupation of the country," and the Commission proposed that a sum of £40,000 should be voted annually for school ships.

This being a general outline of the scheme recommended by the Commission, we will now state what has been done to carry it into effect:—

1. A Naval Reserve has been enrolled, it is now called the first class reserve, and consists of able seamen who must be under thirty years of age when they are enrolled, and who may remain until they are sixty years of age unless worn out before. This reserve numbers at present 14,800. Every man is a fine specimen of a British A.B. seaman,—is above a certain standard of height and size, and is drilled in the use of great guns, etc. Each man receives a retainer of £6 a year in addition to drill pay. Retainer and pay, etc., together amounting to about £10 a year.

2. A second class of reserve has been formed, intended to include ordinary seamen and fishermen. These are to receive £2 10s. a year, and a suit of clothing, with drill allowances, etc. This reserve is a failure.

On the other hand,

1. No vote has been taken to carry into effect the all-important recommendation of the Commission, the backbone of the scheme, viz.:—the training of boys in school ships.

2. No steps have been taken by which any increase has been made in the Naval Reserve to supply the place of the Naval Coast Volunteers, who were put down at 10,000 at the time the Commission reported, and who were not necessarily seafaring men, but whose numbers are now very small indeed.

The reserve scheme naturally resolves itself into two divisions, (1) men for the present purposes, (2) boys for the future supply; and we will consider these divisions separately, beginning with the men. The first class reserve is our only reserve of trained

merchant seamen; it consists exclusively of A.Bs., and numbers only 15,000. The question naturally suggested is, why have we only a reserve of 15,000 when the Royal Commission recommended 30,000, in addition to the 10,000 coast volunteers who have since dwindled away. There are some who think that the answer to this question is, that the British seaman has suffered deterioration to such an extent, that there are only 15,000 out of 300,000 who are fit to be enrolled in this reserve. Let us consider how far this allegation of deterioration is worth anything.

The writer of these remarks is not one of those who believe that the British seaman has deteriorated within the last few years. On the whole the writer has every reason to believe that the reverse is the case. Those who think the British seaman has suffered deterioration are as a rule owners of sailing ships, whilst those who think the reverse are as a rule owners of steam ships. The possession of these opposite ideas by the two classes of shipowners suggests the truth, and it is that under the present state of things the line of demarcation between good and bad is more complete than before. The good seamen keep to good lines of ships (chiefly steamers) where they get better wages, and the worse seamen are left to other ships where as a rule the wages are lower and the employment less constant. The whole question of selection is a question of wages. So long as the shipowner can give constant employment and good wages, he will never lack a good supply of good British seamen.

The allegation that there are only 15,000 A.Bs. fit for the reserve in the British merchant service is startling. If it is true, then any attempt to increase the A.B. reserve is folly, for if there are no more seamen in existence fit for it, it is useless to take steps to get more to enter it. The statement is however only valuable in so far as it discovers the untrustworthy nature of the information on which it is founded. A very superficial inquiry as to the number of good A.Bs. in any ship who are not reserve men, would satisfy the inquirer that the ranks of the A.B. reserve can be increased and with good men. That the A.B. reserve can be increased there is no doubt in the minds of practical men: whether the nation wish to increase it is the only question. That it does not increase in numbers is traceable to very simple causes. The regulations as to admission are necessarily very stringent, and the regulations as to enrolment and drill are not suited in many instances to the convenience of the great bulk of merchant sailors. To increase the numbers it is necessary to increase facilities for enrolment and drill. The second class reserve is intended for ordinary seamen,

and consists at present of about six members. Now assuming (without admitting) that no more A.Bs. can be enrolled in the first class reserve, because there are no more A.Bs. fit to be enrolled, we cannot assume that there are only six merchant seamen fit to be enrolled in the second class. There must be something in the regulations operating to keep them out. The numbers of the second class can be increased (preserving the present conditions as to enrolment) by an expenditure of money. The expenditure in this case as in the case of the first class, must take the very reasonable shape of providing increased facilities for enrolment and drill, and perhaps, though this is doubtful, an increase of retainer. It is rather too much to expect a seaman to spend days in travelling to a place where he can be enrolled, on the mere chance of his being accepted. Seamen are as a class not too well off. A seaman employed in the fisheries may have every desire to enrol, and may be one of the most loyal and patriotic subjects in the realm, but his loyalty and patriotism cannot be made available unless he can find money and time to undertake a long journey, and he must even then have a superabundance of loyalty to enable him to spend his money and his time on the mere chance of being accepted for enrolment after all.

We can only repeat that the question of a reserve for the navy is purely a question of money. If we want a reserve of seamen we can get such a reserve as the world never saw, but we must spend money. It is idle to say that because we have not been very successful as yet, we cannot get a reserve at all. The contrary is the case. The numbers who have entered the first class under the present severe restrictions prove this. The men are there, the machinery exists.

If we are to keep up an immense standing navy, it is only a question of money and of keeping British seamen out of the merchant service. If we are to keep up efficient reserves, it is still only a question of money and of encouraging British seamen in the merchant service. Either method is practicable—one or both are necessary. With a proper expenditure and proper management we can keep a good navy and sufficient reserves. We may in short be sure of one thing, that if the naval reserve is not kept up it is not because of any insufficiency of British seamen.

Let us give an illustration. The only places at which the second class reserve men are allowed to drill, and at which their enrolment can be completed, are Leith, Hull, Harwich, Southampton, Weymouth, Liverpool, and Greenock. All the ordinary seamen, etc., employed at Gainsborough, Goole, Grimsby, Hartlepool, Newcastle,

Scarborough, Shields, Sunderland, and Whitby, must go to Hull if they want to join the reserve, and they go on the chance of being accepted or rejected, for the necessary examination of the men belonging to those ports can only, under existing arrangements, be made at Hull. The seamen and fishermen belonging to St. Ives, Hayle, Penzance; the Hebrides, the Shetlands, and Orkneys, would have to undertake journeys varying from a day to a week, and in the end might be rejected on application. These are only a few examples of the causes of failure of the second class scheme.

Supposing, however, that a little money were voted to enable men to undergo their examination by the doctor and naval officer at their own ports, and suppose a little money were spent in drilling the men for a year or two nearer home, as was done in the first class reserve, in batteries ashore, or in training hulls provided for the purpose. Suppose this to be done, then a second class reserve would spring into existence instantly. The second class men must now also at once undertake to spend a month immediately in drill on board ship, generally away from their homes. This is not the case with the first class, who have more facilities, such as taking their drill in instalments, and at places conveniently situated. Now, assuming that one class of the reserve should drill exclusively on board coastguard-ships, and not in other drill ships or in batteries, it may be open to question, whether the first class would not be benefited if they were to do this rather than the second class.

Let us give another example. By the regulations, "No man will be eligible for the second class reserve unless he is able to hand, reef and steer, and to pull a strong oar. He must also box the compass, and know the marks on the lead line." And, further, "No applicant is to be accepted who is under eighteen or above twenty years of age, nor unless he is a British subject, *able to speak and understand the English language*, is free from physical defect, and is in health, character, and every other respect especially eligible."

This is no doubt a wise regulation, and thoroughly sound in principle. There is, however, no knowing how such a regulation may be worked or twisted in practice. Inconvenience has, doubtless, been felt on some of her Majesty's ships at some time or other, by the presence of a Welshman who understood nothing but Welsh, or a Scotchman who understood nothing but Gaelic, or by having on board seamen who could not take their turn at the wheel, or at reefing and handing. The inconvenience would be apparent. Inconveniences always are apparent, but general principles are often lost sight of, and it may be open to question whether the attempt to avoid the repetition of small inconveniences

which may have been felt on particular occasions, and by particular officers, may end in preventing altogether the development of a scheme. This is especially true in the case of such a scheme as that for the formation of a Naval Reserve. In short, the fault of the regulations appears to be that they are calculated to avoid petty inconveniences at the sacrifice of general principles, and so to keep men out of the reserve rather than to get men in. The facilities for enrolment are few, and, further, the sailing element is thought too much of, and the fighting element is altogether disregarded in its favour. The men who are especially eligible for the second class reserve are those fine fellows who man our coasters and our deep sea fishing vessels, the latter of whom form almost entirely the crews of our pleasure yachts. These men, by the time they are twenty, have generally spent six years in actual service afloat, and have probably been all their lives in and out of boats and vessels. It is monstrous to suppose that they are not good seamen, but it is equally monstrous to suppose that they know anything of the running gear, or of reefing sails as practised in square-rigged ships like men-of-war. It is possible, and we believe highly probable, that the regulation as to handing, reefing, and steering would keep out but few eligible men, for good sailors must know these things in their own practical manner; but if this regulation really does keep them out, surely they could be taught such matters gradually during their period of drill. As regards the marks on the lead line, etc., fishermen may know these things practically after their own fashion; but suppose, instead of rejecting at once and outright fishermen who have not learnt all these things on board their smacks, they were taken on probation in the reserve for a year, and taught to hand, reef, and steer, and box the compass, and to do other things in the fashion of the Royal Navy, in addition to being drilled, what would it mean? Simply money, always money. In this case money for an instructor. A fisherman may be physically able to trail a gun, he may be a good shot, able to knock a gull over on the wing, to hit the bull's-eye with a rifle shot, he may be able to cut through any cutlass guard, he may be able to do all these things and many others, and yet not be able to "hand" or to "reef" like a naval man, or to "steer" an ironclad, or to box the compass like a naval man, or to know the marks on an Admiralty lead line. If he is a good fighting man, with a splendid physique fit for the great duties of a naval gladiator, it will surely be better to accept him and instruct him in the lesser duties of routine than to reject him outright altogether. In time of war his physical powers would

render him more valuable than a boy who had just entered the service, and his knowledge of the sea, and of gunnery, would render him of more value than a full-grown novice just enlisted from the shore or just pressed. At any rate, if he could not perform the whole of the naval duties of a man-of-war's man, he could perform some of them, and would in the use of great guns be invaluable. The funds at the disposal of the Admiralty for reserve purposes have been so very limited, and the desire of the country has been altogether for retrenchment, that the reserve regulations, if they have prevented the enrolment of any number of men, have been the means of exactly fulfilling the wishes of the country. The Admiralty would willingly do what is necessary.

Boys.

With regard to boys, we have to consider whether we (Great Britain) are to train boys to meet the whole annual waste of British merchant seamen, and the whole increase of men required for British ships for the whole Empire, or whether we are only to train up a portion of the whole number. If we are not to train the whole, what should our proportion be, and why, and how far are we to proceed?

Many British ships never trade with this country, and some never have on board British subjects at all, or if they do have British subjects, these subjects are natives of the colonies or of our possessions in Asia, etc. For example let us take the case of British ships registered and trading entirely abroad—India, China, Japan, and other parts of Asia, Australasia, and some parts of Africa, etc. It would be useless to attempt to train British boys to serve as crews of most of these ships—Coolies, Lascars, Kromen, Arabs, etc., natives of the places at, and with, and between which the ships constantly trade, are from all considerations, and from all circumstances, the proper and the best crews for such ships. Again, as respects fishing and coasting vessels employed in the various British Possessions abroad. These ships never come to this country; they are owned and manned by people with local associations and traditions. It would be useless and, perhaps, impertinent for Great Britain to volunteer to train boys in the United Kingdom for these ships. And, again, we need not include colonial ships which trade between one colony and another, or between our colonies and foreign countries. If these views be correct, then, at any rate at first, we shall only have to concern ourselves with the training in the United Kingdom of boys (1) for service on board ships registered in the United Kingdom, and (2) partially for boys for British ships registered in the colonies, and trading with the United Kingdom.

The Royal Navy now chiefly and properly rely on their own training ships for boys, but they would no doubt be quite willing to accept any boys who might be fit for the Navy, although trained in the mercantile marine training ships.

The next point is, what is the waste per cent. per annum of this number from deaths, desertion, leaving the service, etc., etc. If we could only find the waste per cent. per annum, we could fix the number of boys we should want to train; but as the annual waste per cent. per annum cannot at present be stated, we cannot fix the number of boys required per annum. In this state of things the only course open is to regulate the numbers to be trained by the demand, and we can make this experiment with the training ships already established by private enterprise. If the training ships at present established train the right sort of boys, and if these boys are all able to get situations on board ship, the present ships are not sufficient. But if the boys at present trained cannot get employment in merchant ships, then it is reasonable to suppose either that training ships have actually already gone too far, and train too many boys, or that they do not train the right sort of boys. The Royal Commissioners put the number down at 2,400 annually, or say about 8,000 always under training. At present the number under training is 2,300.

And now as regards the sort of boys who ought to be encouraged to enter the merchant service. The Act of 1835 began with the following preamble:—

"Whereas, the prosperity, strength, and safety of this United Kingdom, and of His Majesty's dominions, do principally depend on a large, constant and ready supply of seamen, as well for carrying on the commerce as for the defence thereof;" and went on to provide for the enrolment of apprentices as follows, viz.: "And whereas, the giving due encouragement to such of the youth of the United Kingdom as shall voluntarily betake themselves to the sea service, and obliging others to do so who by *reason of their own or their parents' poverty are destitute of the means of obtaining subsistence and employment, will not only greatly tend to the increase of able and experienced seamen as well for the service of the Royal Navy as for carrying on the commerce of His Majesty's Subjects, but will likewise provide them with employment, and thus materially diminish the* burthen of expense cast upon parishes by their maintenance." This enactment led to the compulsory introduction into the merchant marine of boys of Dickens's NOAH CLAYPOLE class.

It was no doubt a good thing to find employment for the poor—and also a good thing to relieve the poor rates. It is however open to

grave consideration, whether this driving into the British mercantile marine of parish apprentices without previous training, generally parish apprentices who were good for nothing else, and so making our merchant ships refuges for the destitute, was the way to increase the strength of her Majesty's dominions, or to give a proper tone to the mercantile marine. Those of our readers who are acquainted with the facts contained in the celebrated Consuls' letters presented to Parliament in 1848, can only blush to think that the mercantile marine referred to in the early letters is the mercantile marine of Britain. There can be no doubt that one of the most important elements in bringing about the deplorable state of things disclosed in those letters was the very low class of a great number of boys drafted or forced into the merchant service.

In any scheme in which the State is expected to co-operate, the first thing should be to see that payment for the training of boys is made only for the class of boys that will be of use to the State. At the present time, there are in existence in the United Kingdom thirteen training ships for the merchant service, with about 2,300 boys on board. These ships may be classed into groups—

Group 1, consists of two ships, the *Worcester*, in the Thames, and the *Conway*, in the Mersey. They are naval colleges to which boys are sent whose parents or guardians can afford to pay liberally for their education. The boys on these ships are a high class of boys, fit to become officers of the British mercantile marine, and capable of doing credit to the service. They at present number about 260.

Group 2, consists of one ship only, the Marine Society's Training ship *Warspite*, in the Thames. This is the parent of all training ships. It is supported by voluntary contributions, and receives on board the sons of the labouring classes, as well as boys unconvicted of crime, whose friends cannot afford to send them to sea. The *Warspite* is not an Industrial School, nor is it a Reformatory. It receives no aid from the government, all is done by voluntary contributions. This ship has on board now about 180 boys. In 1869 it sent into the Royal Navy about 100 boys, and into the merchant service about 160.

Group 3, Industrial Schools. These ships are seven in number, and are capable of accommodating 1900, although they only have on board about 1250. They are—

Formidable	at	Bristol.	*Southampton*	at	Hull.
Havannah	,,	Cardiff.	*Indefatigable*	,,	Liverpool.
Mars	,,	Dundee.	*Chichester*	,,	London.
Cumberland	,,	Glasgow.			

[Although we have included in this list the *Indefatigable* and the

Chichester, we would observe that they are not certified industrial schools and receive no State aid whatever.]

These ships are for boys of the "street Arab" and "ragamuffin" class. Regarded from a philanthropic point of view, these seven ships are foremost amongst the many noble institutions of Great Britain; and the boys sent to sea from them after training are infinitely superior to the old parish apprentices. To rescue the "street Arab" before he commits crime: to place him under proper guardianship, to instil into him habits of cleanliness, truth, obedience, and to teach him to read and write, and to work at a profitable trade, is indeed a work on which the promoters of these ships may look with satisfaction. These ships can accommodate 650 boys more than they have on board at present.

Group 4, Reformatories. These are for boys who have been convicted of crime. They are three in number, and can accommodate 750 boys. They now have on board 647. The ships in groups 1 and 2 receive no aid from the State, whilst the ships in group 3 have received £11,870, and in group 4 £8,906, making a sum of £20,776 voted by the State. This shews that the State does not contribute anything towards sending into the mercantile marine the boys of respectable and honest parents who may be poor. Let a man be ever so much in want of assistance for his children, so long as he is honest and deserving, and keeps his boys out of the street, he shuts them out from participating in the contributions given by the State; but let him turn his boy into the street to become a complete "ragamuffin," and there are then chances that he will be put on board a training ship, treated well, looked after, taught a trade, and launched in the world with a chance of getting on. This is discouraging to the worthy poor, and encouraging to the thriftless and idle.

The State aid to which we have referred is given under the Industrial Schools' Act, but the time has come when something might perhaps with propriety also be given out of the Mercantile Marine Fund, or, as suggested by the Royal Commission, out of a special vote. In the absence of any proof to the contrary, we may assume that the existing training ships are sufficient to make an experimental start. Several of them are not half full. We had hoped that Mr. Chichester Fortescue would have taken the matter up in the new Merchant Shipping Bill, but in the 696 clauses of the new Bill we regret to be unable to find any allusion to this important matter. We continue to hope that it will not be lost sight of, and in the meantime we venture to throw out the following suggestions for what they are worth, in the hope that something

better may be found. The same ideas may have presented themselves to hundreds of people before, and are only valuable in so far as they reproduce the scheme of the Royal Commission. Apart from that scheme new ideas are not valuable, and valuable ideas are not new. We only wish to shew that the proposal for training boys is not such an impossible one as many people believe.

Our proposal is—

1. Let a sum equal to (say) one-third of a year's keep be paid by the Board of Trade out of the Mercantile Marine Fund, or out of a public vote, to the training ship in which the boy is trained, for every "approved boy" who is apprenticed out of that ship to the sea service. The expense per boy per annum on board the training ships is £20, sometimes more, sometimes less. Let the apprenticeship be to the Registrar General of seamen, and let the boy be a member of the reserve. By these means the 2,400 boys proposed by the Royal Commission to be trained annually, can be trained in existing ships or ships like them, without the expense of a separate and additional establishment of training ships. This is a very important economical consideration.

2. Let a similar sum be given by the Admiralty out of the naval vote for every "approved" boy who enters the Royal Navy, out of the present ships.

3. Let "approved" boy mean a boy who comes up to a standard to be fixed as regards character, size, proficiency, age, health, and time of training, etc.

4. Let encouragement be given for increasing training ships of the *Warspite* class, or for training on the existing ships, sons of the labouring classes who are neither street Arabs nor convicted boys.

5. Let "approved" boys form a nucleus for a third class reserve. This would form the backbone as pointed out by the Royal Commissioners.

Training ships, especially those of the industrial school class, could continue to go on with their works of benevolence in rescuing street boys and teaching them trades. Some of these boys will become "approved" boys, and others will enter the merchant service or other trades as ordinary boys. There will always besides, be entries into the merchant service by "'long-shore" men, and apprentices, and boys who have not served any training, those entries should not be stopped or interfered with, unless the action of some system such as that proposed above may by its own operation, lead seamen who enter in the merchant service to enter that service through a training ship.

There is no reason why training ships should not be started in

the colonies with like assistance, if the system is found to work well in the United Kingdom.

Conclusions.

Our conclusions are—

1. That the safety of the British Empire in times of peace does not now depend on the existence of a large body of British merchant seamen.

2. That the safety; even the existence of the British Empire in time of war does depend on the existence of a large body of British merchant seamen.

3. That in order to ensure the existence of a large body of British seamen in time of war, it must be kept together in time of peace.

4. That there are ample seamen at present in the British merchant service for all State purposes.

5. That the value to the State in time of war of a large body of British merchant seamen, is dependent on and in direct proportion to the efficiency of the means provided for making use of them.

6. That means are not yet organized whereby a sufficient body of British seamen can be made of use in the Royal Navy.

7. That fishermen and other crews of coasting and home trade ships are especially eligible.

8. That if means are adopted the majority of these men can be enrolled.

9. That her Majesty has an undoubted right to the services of all British seamen, but that in order to make those services of use the seamen must have previously acquired a knowledge of gunnery and naval drill.

10. That the scheme of the Royal Commission has not been fairly tested, inasmuch as its most important recommendation has not been attended to.

11. That the scheme of the Royal Commission is a wise scheme, and that it should be carried into effect in its entirety.

In closing our paper we have just two remarks to make. In the first place we wish to point out that in our estimates of the number of men available for the reserve, we have altogether omitted boatmen, bargemen, and lightermen, all men who have generally served at sea before settling down ashore; we have also omitted that numerous and miscellaneous body of men on our coasts who are neither entirely landsmen nor entirely seamen, but who have often served a regular apprenticeship to the sea service. We have not taken any of these men into account, because they cannot by any

possibility comply with the reserve regulations as to service at sea which is as follows: "Every applicant must prove at least three years' service at sea, and of these three years' service one year's service at least as ordinary seaman. In the case of apprentices who have completed their indentures for a term of not less than three years, proof of one year's service as ordinary seaman will not be required. He must also prove that he has been at sea within three months previous to his making application for enrolment." It may be open to question whether watermen and other seafaring men, who are not actually engaged at sea, but who may have been apprenticed to the sea and are sailors, should be altogether shut out of the reserve. They are at any rate better than the 10,000 Coast Volunteers who were sometimes farm servants, ostlers, and other purely shoregoing folk.

There would be an immense deal of suitable work for reserve men in steamers, gun-boats, and other vessels that do not carry square sails, or that do not carry sails at all, and that would be employed in navigating rivers and coasts. We do not however venture to place this opinion against the professional opinion of the advisers of the nation. We only wish to point out that if the country should ever want the services of these men, they number some 10,000 to 12,000, and are always in the United Kingdom. As regards the value once attached to them we have only to refer to our school histories, and we shall find that when the Spanish Armada threatened us, thirty ships of war were sent from the Thames chiefly manned by boatmen of the river, whose effectiveness in time of imminent danger was thus placed beyond doubt. Circumstances probably have changed since then, and so long as seamen who actually remain at sea can be enrolled in sufficient numbers, they should no doubt be preferred.

Our closing remark is more important. Some of our readers, especially those of the alarmist school—who are always clamouring for large armaments, and who would if they had their own way, rush into an enormous expenditure—may embrace the present moment for riding their hobbies, and may point to what we have written, and on it found some sort of attack on the present and late administration of naval affairs. To these alarmists, and fault finders, and hobby trotters, we can give no comfort. We are not of their views, nor on their side, and we tell them so plainly. We have spoken as we usually do when writing on subjects connected with our mercantile marine, in a plain and unmistakeable manner, but we have spoken in no party spirit, and in no spirit of alarm.

Neither the liberal nor the conservative party have taken steps to

carry into effect the chief recommendation of the great scheme of reserve promulgated by the Commissioners, and the only conclusion at which we can arrive is that neither party has as yet thought so great a measure called for. The constituents of both parties have always thought the same; and indeed, so far, both parties have been right, for we have as yet had no necessity for using the reserve. And what is more, if appearances are to be believed, no necessity for increasing our naval force is likely immediately to arrive. We advocate no hasty steps. We merely urge that the recommendations of the Royal Commissioners should be carried into effect quietly, unobtrusively, and effectually. No panic, no enormous increase in expenditure is necessary; on the contrary, a modest addition of £50,000 will do all that is now required, provided only that it is spent in carrying into effect those recommendations. All sorts of propositions will be made, and doubtless for all we know, have been made, and some may be under consideration. All sorts of wild schemes and all sorts of imperfect and crude plans will be proposed if they have not been already suggested: but to spend money on adopting any partial scheme in lieu of the complete scheme of the Commissioners will be as unwise as not spending it at all, although certainly it would be less troublesome.

We have seen what the Germans have done in defence of their great and worthy Empire by reserves properly trained, and we can even do more with our naval reserve. All we want is to bring into play common sense, consistency, and completeness. Everything that we do must be done not with the consideration for the Royal Navy alone, nor out of consideration for expediency and temporary necessity; but with a due sense of the improvement and requirements of the mercantile marine, and with ultimate views as to completeness.

The Manning Commission looked upon the Reserve as a means of drilling the *elite* of the merchant navy to guns; of introducing them to naval discipline; of breaking down the barrier between the merchant sailor and the Navy; and of converting a large proportion of the merchant navy into a sort of militia, capable of defending themselves, or of serving the country if an emergency should arise. The direct and most obvious object of the Commission was, no doubt, to have an actual enrolled force which could at any time be called out. But the less direct objects above referred to, were objects they had equally at heart.

The prospect of getting most of the Reserve men for the Navy in case of war is (improperly, as we think), looked on as uncertain

by some persons. Of the success of the Reserve in the secondary and less direct point of view above referred to there cannot be a doubt. And as regards manning the Navy itself from the merchant service, we believe that the Reserve instead of competing with and hindering it, as naval men sometimes assert, has broken down many of the prejudices with which merchant seamen undoubtedly used to regard it.

The measure to be perfected then is not a measure for one department of the State alone to undertake, but for two departments, viz., the Admiralty and the Board of Trade. If the Admiralty alone undertake the work it will be partial and will certainly fail; and if the Board of Trade alone undertake it the result will be the same. Such a measure can only be carried to a successful issue by co-operation. It was by the co-operation of the numerous staff of these departments that the present first class reserve was established, and it is by their co-operation that it exists; the Admiralty representing the fighting element, and the Board of Trade the commercial element. The due appreciation of this point will not only prevent failure, but will in the words of our old statutes contribute to our prosperity in time of peace, and secure the "strength and security of her Majesty's dominions."

In our next number we shall consider the subject of loss of life at sea: and inquiries into wrecks and casualties.

THE ELECTRIC LIGHT ON SOUTER POINT.

In the article on this subject in our February number, we made some allusion to the novel and valuable method adopted at the new lighthouse for utilizing the landward rays of the electric light. It seems that we were under a misapprehension as to Mr. Douglass' share in this ingenious plan, for that gentleman asks us—in justice to Mr. James T. Chance, of Birmingham—to inform our readers, that although the idea of making the back light serviceable by sending it down the tower and out on to the sea from a lower window was his own, it was placed in the hands of Mr. Chance to carry out, and the optical apparatus which performs that duty is solely due to the latter gentleman, and realises Mr. Douglass' idea in a very satisfactory manner.

P

JAMES KENNEDY.

A Tale of the War Time. Edited by D. J. M.

How I got the Tale.

A tale of the war time! What war time? The Russian or the China war?—Neither the one or the other, but a tale of the genuine old war when "George the Third was king!" aye, and a genuine tale too, and a genuine man to tell the tale! None of your 'long shore yarns got up to please a parcel of land lubbers and servant maids, with a sailor hero with ringlets and a ring on his finger, a frock coat and a long-faced hat raking aft, trying to ape the gentleman and can't do it, try he ever so hard. No, no! my hero is a tar of the old school, with a rough voice and a rougher hand, a broad hairy breast, like a thrum mat, and a kindly heart beneath it: and this is how I came by the tale. I went down to Greenwich:—

Oh, you went down to Greenwich, did you, Mr. Editor! and to find a genuine tale of the old war! no doubt you did, and found one: the bait took—not the *white*-bait, you doubtless took that with a due proportion of brown bread and butter, and also of "Ship" or "Trafalgar" sherry, etc.—but you baited your pocket with a few ounces of genuine shag or pig-tail to catch an old pensioner, and having caught him, he made you believe he was a hundred years old and told you no end of yarns, all of which you have booked as true and genuine, and then he went off with a quid of your pig-tail in his cheek—and you with your *quid pro quo*, oh fie!

Now, if you know how I came by the tale better than I do myself I had better close this chapter at once, and if you interrupt me again, I will; besides which, I hate punning—and punsters.

The only point you are right in is that which I told you myself, viz.: that I went down to Greenwich; and I will now tell you how and why I went down to Greenwich.

There are moments in men's—and I suppose in women's—lives, when one feels low-spirited and wretched, without knowing why. No cause can be assigned for it; unlike the headache and dejected state of mind that supervene a night of parting with a bachelor friend about to bind himself with matrimonial chains, it cannot be attributed to the salmon or a bad cigar. Some say the weather has its influence—I know an easterly wind makes me as cantankerous as possible. But whatever the cause may have been, it is enough to say that, one sultry afternoon in September last, I was feeling

particularly miserable and dull, and as no one was by to kindly throw me into the river, I threw myself into the train, and in a few moments found myself in the ancient town of Greenwich.

Whether it was the rapidity of the very slow train that conveyed me down, or the consciousness that I could meet no one that knew me I know not, but I certainly did feel lighter hearted as I stepped out of the greasy, and somewhat redolent, station into the street.

Greenwich, at the best of times, is not a lively place, and was not even in its palmy days, when the Hospital was full of hobbling and wabbling pensioners, destitute of their due proportion of eyes or limbs; when there was a real Governor, and real officers were to be seen going about in uniform, and when Greenwich fair brought its annual saturnalia of vagabondism and vice, and the "Crown and Anchor" was in its glory, and we might almost say, when her Majesty's ministers religiously eat their whitebait dinner at the close of the session—Alas! that the breach of that good old observance should be due to the Right Honourable member of the loyal borough itself. But as Mr. Ingoldsby said of a rout, that "the greatest pleasure of having it," was "the pleasure of having it over," so it may be said of Greenwich, that the greatest pleasure of a trip to it is the pleasure of getting out of it, into that glorious park.

Say what you like about Greenwich, call it dirty, tea and shrimpy, going down in the worldy, or any other adjective out of a substantive, to describe it: criticize, if you will, Queen Anne's huge pile of consecrated stone with its angels' heads on the gate posts (in keeping with the pensioners) minus their noses and literally winged in their wings, or any other public or private building—man made those;—but the park, man may have formed and walled it in, but the trees and the grass in their beauty and verdure are not of man; man's part is only to mar it where he can, and he has done his best to spoil its poetry by the erection of some wretched brick sentry-box looking buildings dotted here and there. But it is possible, with a little ingenuity to get out of sight of them, and then, if you can only shut out the roar of the distant Babylon and the occasional shriek of the railway whistle, you may fancy yourself miles away from the busy haunts of men, and with a mild Havannah, the lowest of spirits, or highest of blue-devils, must succumb and vanish.

It was so with me, and after a second weed I was in a proper frame of mind for picking up any waifs and strays to weave or work into a story. I first tried the old woman with the ricketty telescope, but could get nothing out of her but a wheezy cough, and con-

sidering her occupation of standing still on an exposed situation, not much else could be expected from her. I next tried the park-keeper, a very stately man with a medal on his breast, and his hat "much to the fore," who advanced towards me with a stride and a swagger in his gait as if he were "monarch of all he surveyed," and I only admitted by royal sufferance.

"A fine day," I remarked.

"Yaas, sir," he replied, bringing his hand round with a sweep to his hat, as if he wished his hand to travel the longest road to get to it, and raising it from his head, replaced it as though the sun was too powerful for his vision, or that he wished me to get a fuller and fairer view of the very resplendent and new gold band. "Yaas, sir, very fine!"

"Been in the army, I see?"

"Yaas, sir."

"Served long?"

"Not vary long,"—without the "sir," this time—it was evident he began to think I was going a little too far, but I thought I would give him another chance, which generally has the effect of opening either a soldier's or a sailor's heart and giving reins to his tongue: taking the cigar from my mouth, I motioned it to the medal on his breast and said, "What action?"

He looked at me so fiercely that one would have thought I intended a direct insult, and answering very sharply, "No action, I was with the Hawmy," turned on his heel and went after two boys who were evidently trying to get some unripe chestnuts by a boy's means—stones; but it was evident my friend could not demean himself by running, and the urchins were soon beyond his reach. The frankness and simplicity of the soldier were lost in the *grandiose* of the park-keeper.

Musing on that vanity of vanities, human greatness, as exemplified even in a park-keeper, I descended the hill, and passing in safety through all the torpedoes laid to catch me, and probably blow me up—*or out*—in what I was told was "Teapot-row," I reached the Hospital gates.

I had not been to Greenwich since the great changes had been effected in the constitution of the Hospital. On my last visit, the first step from the station brought me into contact with the principal produce of the place—pensioners,—the park was dotted with them, you met them at every turn, and within the gates of the Hospital you saw nothing else. I had now not met one, and had it not been for the noble building itself, I should not have known where I was—all was deserted, and desolation reigned supreme. From one

end of the river walk, one solitary policeman, who looked half dead with *ennui*, was the only living soul to be seen; but as I walked along, on one of the hitherto sacred grass plats, some children were playing, while a nursemaid and other children were actually sitting on the hitherto equally sacred seats to the "officers and their families only." What a tale of discipline and order passed away!

I walked from one end of the river front to the other in solitude, and then seated myself on one of the seats, I would have indulged in another cigar but for the one policeman, who for want of other occupation, seemed to take an interest in me.

I had not been there long when a slight cough near made me aware I was not alone, and leaning on the arm of the other end of the seat to which my back had been turned was a little old man with a bright blue eye, a nubbly face and long white hair, which hung down almost on his shoulders from under his wide-awake hat, he wore a long blue coat, and he supported his much bent body upon a stout stick.

"Great changes here, sir," said the old man, touching his hat.

"Yes," said I, "they are indeed, and very great changes since I was last here."

"How long may that be ago, sir?"

"About four years, I think."

"Ah! I was in the college then myself."

"I thought you had been a sailor," said I; "How long were you in here?"

"Nigh upon twenty-six years, sir."

"How do you like being out?"

"Why you see, sir, we has more liberty like, out, but it was very comfor'ble and reg'lar in; raythor too much of the man-o'-war with it, 'you maun't sit here,' and 'you maun't spit there,' but takin' it all in all, it warn't sich a bad place arter all." "Why, sir," said he, sitting down, "it 'ud ha' done your 'art good to a seen all round that collonade—that's our smoking place, sir—over a hundred old men-o'-wars'-men smoking and a spinnin' yarns, and some of the larned youngsters a readin' to others;—it's a fine thing, larnin', sir!"

"Yes," said I, "it is." "I suppose you can read and write?"

"Sorry to say sir, in my day them things wor not gen'rally taught. Why, sir, in my first ship there wor only two men on the lower deck as could read and write, and they drove a rare trade to be sure."

"Trade on board a ship!" said I. "What was their trade?"

"Why, bless you sir, they used to write all the letters for the

ship's company as couldn't write, and precious hard work they had of it when we heard that a ship was ordered home from the station—they had to prepare for it. No re'glar mails then, sir; 'bliged to look out for chances."

"I don't quite understand you now," said I. "How do you mean prepare for it?"

"Why, sir, you see they had dif'rent kinds of letters to write, and used to charge 'cordingly; there was the letters to parients, beginning "My dear Parients"—them was the cheapest; then came the letters to wives; but them as paid best and was longest, was to sweethearts."

"It must have taken a long time to write what each one wished to say, and express all their thoughts," said I.

"Lord bless you, sir," returned the old man, opening his eyes, "thoughts! Why they used to write the letters all ready, leavin' the name out, and when a man wanted a letter he would go to Bill Smith, and say, 'Bill, I wants a letter.' 'All right,' says Bill; 'parient, wife, or sweetheart?' 'Wife, in course,' says the other. 'What name?' says Bill. 'Bess,' says t'other. 'All right,' says Bill, and turnin' over, writes the man's name under 'Fectionate husband,' and foldin' it up, sticks it up and seals it with a buttin, hands it over, and calls for the next man."

"You don't mean to say the man sent a letter to his wife without knowing its contents?"

"'Tents, sir! They didn't want to know the 'tents; they was all alike, and what would please one would please another. It was all right, and as they always got thank'd for their nice letter, it was satisfact'ry to all parties." "Ah, sir," continued the old man, "my master in that ship was a larned man sure-*ly*—he could write and cypher like a angel, he could; he kep' a reg'lar log, sir, on white paper, all ruled as reg'lar as a log-board, and when he was in a good humour he used to say, 'Jim'—that's me, sir; my name is James Cassidy, at your sarvice, sir," taking off his hat and replacing it—"'Jim, give me my disk,' and I used to take it down out of his pidgeon hole and put it on the table; then, taking off his coat and hangin' it up, and turnin' up his shirt-sleeves, he'd square hisself out and write. 'Jim,' he would say, 'it's a fine thing, larnin'; you see, when the Captain logs me I logs him. It's a dang'rous thing to do, but I takes care how I doos it. Now, Cassidy, you may go.' I alwers know'd, sir, what humour my master was in by the way he called me. When he said 'Jim,' I know'd it was all right; when it was 'Cassidy, come here,' I know'd he was only so-and-so; when he called 'James Cassidy,'

he was stiff, but when he called out 'Send that boy Cassidy aft,' I had to look out for squalls."

"What was your master?" said I.

"Didn't I tell ye, sir," said James Cassidy, "Mr. Kennedy was bo'sun of the *Blake*, 74, sir, Captin Sir Charles Brisbane, he as took'd Curacoa. The *Blake* was my first ship, sir; I j'ined her in 1808, and was a boy of the third class and bosun's boy, and a first-rate bosun Mr. Kennedy was, sir. There was no gettin' over him, sir; he could tell if a man know'd how to do a job that he told him to do by the very way he looked at a rope, and warn't he down on the skulkers! Oh, he was a sharp, and a brave man too, was Mr. Kennedy, and much respected by the officers—and what d'ye think, sir?" said the old man, with enthusiasm, flourishing his stick, "the Captin axed him to dinner! I shall never forget the day; we had been shiftin' the foretopmost, and when it was done and all sail made, the Admiral made the signal, 'Well done, *Blake*.' 'Send the Bo'sun aft' says the Captin; 'Sir,' says the Bo'sun, jumpin' aft and touchin' his hat. 'Mr. Kennedy,' says the Captin, from the break of the poop, quite loud like, to let all on the quarterdeck hear him, 'Mr. Kennedy, you'll dine with me to-morrow;' 'Aye, aye, sir,' said Mr. Kennedy, as if obeyin' a order, and so it was a order, sir—it was none of 'the Captin's compliments,' as the steward said, when axing the officers, it was a thing to be done, and he done it, sir. When the Captin give him the order, he turned to the Fust Leftenant, 'Call the watch, Mr. Bracebridge,' for you see, sir, the Captin was a very strict man, and never promised a man a floggin' but he kep' his word; and it wasn't often he spoke to anyone but the Fust Leftenant, or maybe the Doctor sometimes, and when he called Mr. Kennedy aft, you see, sir, it was before he called the watch, so that nearly all the ship's company heard the order, and those that didn't soon did from those that were on deck at the time. It spread like wildfire over the ship; and the next day—I think I sees him now—when the arternoon watch was called, my master came up on the weather side of the foke'sal, with his coat on—he used to call it his 'cord o' sixty;' I'm sure I don't know why, but he did—and a white shirt and frill. I had cleaned his shoes three times before they pleased him; you could have shaved in 'em, sir. He never wore a tye (pig-tail), but even without it he looked quite a gen'l'man. Woe be to the boy that attempted to pass him on the weather side then! a greenhorn that showed his head above the comins, with a kid of slops, he sent aflyin' on to the main-deck. When four bells struck and the drummer beat off, he went slowly down the ladder and aft

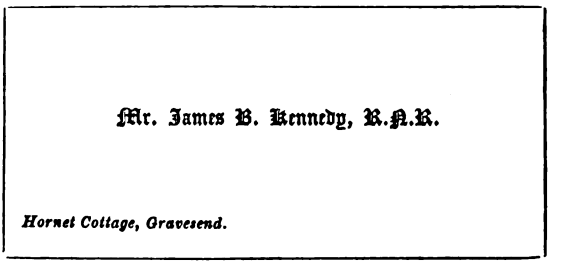
to the cabin door, just as the Fust Leftenant and Doctor came up the hatchway from the wardroom, and a Master's Mate arter them, to dine with the Captin. 'Arter you, Mr. Kennedy,' says the Fust Leftenant, and—would you believe it, sir—he makes Mr. Kennedy go in fust. 'How d'ye do, Mr. Kennedy,' says the Captin, 'take a seat;' and then the door shut, and the sentry, who had held it open, shut it and soon cleared me out. But I did want to see how my master looked a dinin' with the Captin, so I axses Jones, the signalman, to let me have a peep down the skylight, and it was a pictur', sir, to see him a sittin' at table so grand like, with the sleeves of his 'cord o' sixty' carefully turned back. Ah! he *was* a fine man, and a larned one too, was Mr. Kennedy."

It was evident the old man thought more of his first ship and first master than of any succeeding ones, and that his memory was more keenly alive to the events of his earlier than his later days, and I began to feel an interest in the old fellow and his yarn.

"Of course," said I, "Mr. Kennedy is not alive now?"

"No, sir, in course not; but about three and a harf year ago, as I were a sittin' in that seat yonder—the one over agin the buildin', where we gets the sun and cheats the nor'-east wind—a gen'l'man came up and begins a talkin' to me, and axed me about the old *Dreadnought* there—as isn't the old *Dreadnought* at all, but the *Caledonia*. But, sir, he couldn't disgise hisself; I see'd he was a sailor-man at once, and says I, 'You've been at sea, sir?' 'How d'ye know?' says he. 'Why, sir,' says I, 'I could see it by the cut o' your jib as you come along.' 'Well, you're right,' says he, 'I've just come home from Injee, and was the first to pass through the Suez Canal.' 'Was you indeed, sir,' says I. With that he axses me if we had many war-time men in the college, so I tells him, not many of the old war-time men now. 'Do you know,' says he, 'if any of the men were ever in the *Blake*, 74?' 'I was, sir,' says I, 'but it's a long, long while ago now, sir, over sixty years.' 'Do you remember if there was anybody o' the name of Kennedy aboard?' 'On course I do, sir,' says I, 'if you means the Bo'sun, *Mr.* Kennedy?' 'Yes,' says he, 'that's who I mean.' 'Did you know him, sir?' says I. 'Know him! I should think I did; he was my father.' 'Your father, sir!' says I, and up I jumps as if I was fifty years younger, and seizes his hand and shakes it so.. 'I sees it now,' says I, 'in your looks, sir. Why your father was my master, and a very good, kind master he was too.' With that I shakes him by the hand again, and he sits down alongside of me and we has a long talk together, and I axsed him if he ever see the beautiful log his father kep', and he telled me he

ha' got the log hisself, and if I would come down to Gravesend he would show it to me; and he gives me his card, and here it is," said the old man, taking out his tobacco pouch and producing from an inner pocket a well-thumbed card—



While I was looking at the card, a pretty-looking, fair, blue-eyed girl, about nine years of age, came up to the old man, and calling him "Grandfather," said she had been looking for him everywhere. "Have you, my pretty one?" said he; "why I was here all the time." "This is my grand-daughter, sir; the daughter of a sailor, too, sir. Her father, my only son, sir,"—and here the old man's voice trembled—"was drownded in the *Orpheus*." The little girl looked up timidly, and gently—oh, so gently—wiped a big tear-drop that was stealing down the old man's cheek. "Come, grandfather dear, it is time you were home, come along with me;" and the old man rose, and saying "I hope I arn't been too bold, sir, in my conversation, and it's wishin' you good-day; you see she will have me, I must be off,"—he turned and took the child's arm. I shook the old man heartily by the hand, and gave the pretty blue-eyed child——What's that to you? It may have been a kiss of honour and respect. As I turned to go towards the opposite gate I looked round, and the bent old man was still holding to the young girl's arm. Maybe, thinks I, it is the young modern steamer towing the old hulk to his last moorings.

"Ticket, sir," said the man at the station, and putting my hand into my pocket I took out Mr. Kennedy's card. I had unconsciously put it in when the little girl interrupted us. Of course, it was useless to go and look for the old man, as I did not know where he lived, so I was obliged to retain his card.

On my way up I could not help thinking over the interesting conversation I had had, and it suddenly occurred to me that I should like to see Mr. Kennedy's log; but Gravesend was a long way for a lazy man to go, and he might not be at home, so I resolved to write and ask for a sight of the precious document.

On reaching my lodgings I did so, telling Mr. Kennedy how I had come to the knowledge of the journal being in his possession, and requesting as a favour that he would let me see it, at the same time informing him who I was, and asking permission, if I found it would be interesting to a general reader, to make extracts for the "Nautical," and adding that, if he wished, I would carefully suppress his father's name. By return of post I received a roll and the following note:—

Hornet Cottage, Gravesend.
September 7th, 1870.

Dear Sir,—According to your wish I send you my father's journal, and at the same time a biographical sketch of his life, which I have written.

It may appear that I give him a more prominent part in some of the actions in which he was engaged than it is possible for a man in such a subordinate position as a boatswain to have acted in, but I must remind you that Warrant officers in the Royal Navy held a better rank, and filled more responsible stations, during the old war than they do now; and also that in actual fighting with cutlass and pistol, especially in boats, good swordsmen and brave men are generally found in the front. And to show the respect in which he was held, I have myself twice seen the late Sir Edward Codrington make him sit down to breakfast with him; and as a proof that he was also much esteemed by the men, when the *Blake* was paid off the crew made him a present of one day's provisions, and a day's provisions for the crew of a line of battle ship is a very handsome present.

I have nothing more to add than to request you will make what use of the journal you please, and may also use my father's name, as I have every reason to be proud of having had such a father. I am, etc.,

To D. J. M., Esq. JAMES D. KENNEDY.

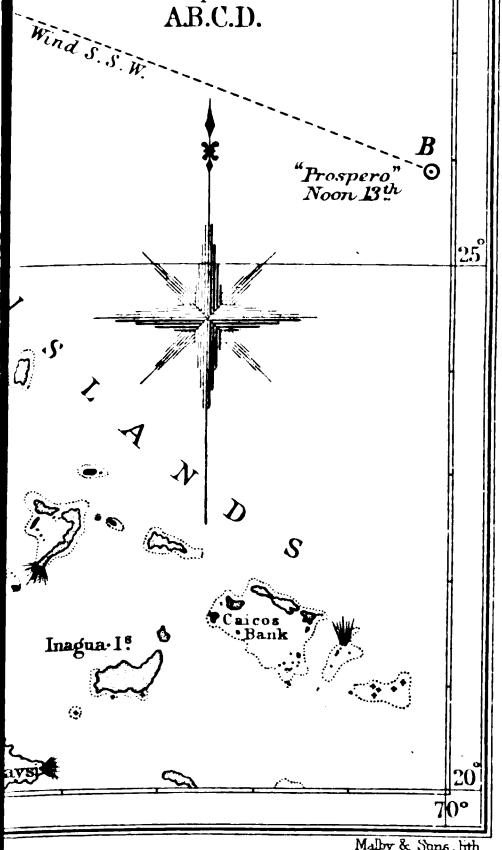
The journal was a well-kept one, and would have been of much value to a compiler of a naval history, but would not be interesting to the general reader; but the biographical sketch of the son I found so graphically written that I do not hesitate to give it almost verbatim.

(To be continued.)

HURRICANES IN THE WEST INDIES.

THE following very interesting letters, etc., have been forwarded to us from the Meteorological Office, and we are glad to be able to publish them for the general information of maritime men. Sir W. H. Walker, of the Board of Trade, kindly sent us a small chart of the track of the October cyclone, but that from the Meteorological Office being larger and more explicit, we have only published the latter.

TRACK
OF THE HURRICANE
AT PASSED NASSAU ON THE 12TH OCTOBER 1870,
from observations
TAKEN ON BOARD H.M.S. "PHILOMEL"
and verified by the
WINDS EXPERIENCED BY THE VESSELS
at the positions
A.B.C.D.



Malby & Sons. lith.

of American schooner "General Grant" on the
tre of the storm, being consequently to the S.E.
F. position of Cardenas.
storm was very severe.

Meteorological Office, 116, Victoria Street,

London, February 7th, 1871.

Sir,—The enclosed letter and paper from Captain Lecky, together with his very excellent log, have been brought to the special notice of the Committee of the Royal Society, who manage this office.

The Committee have decided that the paper should be sent to your Magazine as an able statement of the slight indications of danger which exist on the outer verge of a hurricane. It shows clearly how the swell of a hurricane overruns its winds, and becomes a good indication of the bearing of its centre, but there is no proof that the ship experiencing the swell is likely to get the wind which produced it; a fact we cannot wonder at, considering that waves are found to travel, in deep water, between one and two thousand miles in a day.

If your readers will take the trouble to draw a rough diagram of the wind's direction in a Northern Hemisphere hurricane, or better still, place Piddington's Horn card for the Northern Hemisphere over a mark on a piece of white paper to represent the ship, so that the ship shall be on the outermost edge of that part of the card where the wind may be supposed to be light from north by west, this will be the ship's place with regard to the centre of the hurricane at eight p.m., September 3rd, where she had a high E. N. E. swell. Now, it seems probable that there had not been a strong easterly wind there, and judging from the course made out for the cyclone, it is most likely that the given spot never had any part of the easterly wind, but that this was the swell from the E.N.E. gale blowing on the N.N.W. side of the cyclone's centre overrunning its wind, and reaching the ship, being as she was W.S.W. from that part where the gale was E.N.E.

Then again, by shifting the Horn card so as to bring the outer verge of west wind over the ship, it places her in a position south of that part of the cyclone where the gale is raging from the north, and the northerly swell may be expected to overrun its wind and reach the ship. This was the case at ten p.m. of September 4th.

A similar method may be followed with each of the ship's positions until she comes to a part of the sea over which the vortex of the cyclone has been; *there* the sea is very confused, but still the highest seems to run from that point which has its strongest wind directed towards her.—Yours faithfully,

HENRY TOYNBEE.

To the Editor of the Nautical Magazine.

January 25th, 1871.

My dear Captain Toynbee,—A few hasty lines to tell you I send herewith, the register of the last voyage of the *Halley*. Enclosed in it, opposite September 6th and 7th, you will find a loose sheet containing an account of our being in the neighbourhood of a hurricane, which I think you will find very interesting. After our arrival at New York some four or five days, accounts came from the south of that same hurricane; several vessels foundered, and the crew of one (a Spanish brig) were picked up on a raft, and conveyed to New York by an American schooner: they were a miserable sight, nearly dead, and covered with deep ulcers caused by the salt water and want of food:—they were taken to the hospital.—Believe me, very sincerely yours,

SQUIRE T. S. LECKY.

STEAM SHIP *Halley*, CAPTAIN S. T. S. LECKY, R.N.R., F.R.G.S., FROM BAHIA TO NEW YORK.

September 3rd, 1870.—Lat. 14° 27′ N., Long. 48° 35′ W.—We were in a position where a steady N.E. Trade-wind prevails, unless deflected or obstructed by tempests common to these seas at this period of the year; but instead of the regular Trade-wind, adverse northerly breezes were blowing, force 1 to 4, Beaufort's scale, with squalls and passing showers. However, I did not then apprehend anything serious, as a careful review of the barometric observations, taken every two hours, shewed apparently settled weather in our immediate vicinity. Notwithstanding this, and knowing that the intertropic barometric fluctuations were usually small in amount, my suspicions were excited, and I was led to watch closely for atmospheric phenomena whereby to detect, if possible, the reason of this abnormal state of things. Among other indications, I noticed a peculiar moaning sound in the wind, which I have always taken as a sure forerunner of bad weather, denoting as it seems to do, an atmosphere electrically surcharged. At eight p.m., ship's course N. 43° W., the wind being N. 18° W. (true) force 2, and the barometer 30·046, attached thermometer 82·9°; the light upper strata of clouds were passing slowly over the moon from east to west: the moon had a burr round it, and a long deep swell prevailed at the time from E.N.E. (true). There were light squalls during the night with rain, and the barometer, though still conforming to the remarkable law regulating its diurnal tidal motion, evinced a slight inclination to fall.

September 4th.—At daybreak the swell was heavier, and coming from E. by N., causing the vessel to roll heavily, as we had no sail set to steady her. The sun at rising appeared of a dead brassy

paleness, and looked preternaturally large; some ten minutes previous to its appearance, the clouds (cum and cum-s) round the horizon to an altitude of, say, 25°, were strongly tinted of a reddish orange colour. These unusual tints disappeared, however, some few minutes after sunrise, but it was not till it had attained an altitude of 3°, that the sun began to give any rays, and then only faintly. At noon the ship's position was latitude 16° 32′ N., longitude 50° 35′ W.; course N. 40° W., wind N. 83° W., force 4, and a long heavy swell at N.E. ½ E.; barometer 30·056, thermometer 82·7°. After six p.m. the sun disappeared in a bank, the clouds were strongly tinged deep red all round from the horizon to the zenith, and had a strange lurid cast, which lasted fully forty minutes after the sun had set: the moon about this time was observed to have a decided *greenish* hue, which, as night came on, gradually resolved itself into a pale and sickly appearance: about 7.15 p.m. it was surrounded by a strongly marked halo 30° to 35° in diameter, and the sky was overspread with a thin cloudy film, amid which the stars were dimly visible as through a veil: the wind came in hollow gusts and moaned fitfully. Had the barometer now fallen, I most certainly would have looked for one of those tropical visitations known as hurricanes:—as it was, and to be on the safe side, we made due preparation for such an unwelcome guest, by sending down top-gallant yards, masts, and rigging, close reefing topsails and trysails, battening hatches, securing everything alow and aloft, reeving life-lines, and looking to lashings generally. At ten p.m. the wind had veered more to the westward (S. 87° W., force 3), and the heavy swell, which in the morning had been coming from E. by N., was now rolling along from N. by E., having come gradually round during the day:—from this, coupled with the steady veering of the wind, I had little doubt a circular storm was raging some 170 miles or so to the northward of us, and pursuing the usual N.W. by W. track, common to these latitudes. It needed no projection on the chart to shew that we ran no danger by keeping on our course to the N.W., as the storm's progressive motion was certain to be faster than our own, which did not exceed seven knots per hour; moreover, the barometer would be sure to give timely warning of a too near approach to the centre by overrunning it; we therefore stood on, and watched all the indications with unusual interest.

Throughout the day, the onward motion of the body of the storm could easily be traced, as its position (always at right angles to the wind) was distinctly marked by a denser formation or heaping up and thickening of the clouds in that particular quarter. These

clouds were of a uniform dull leaden colour, about 15° high, with patches of cum-s in the foreground; there was none of that ragged tufted and rapidly changing formation which a nearer approach to the meteor would certainly have developed, and which I had seen on other and similar occasions in the Indian Ocean.

September 5th.—Eight a.m., wind by this time had veered to S. 25° W., force 4, head N. 38° W., barometer 30·098, thermometer 81·9°. Position at noon 19° 43′ N., 52° 22′ W. The heaviest of the swell was at eight a.m. coming from N.W., but this swell was cross and confused, being mixed up with the north-easterly sea of yesterday: the vessel therefore pitched and knocked about considerably, and was now evidently in the rear or south-eastern quadrant of the meteor which had crossed her bow, speeding on its way towards the Bahama Islands, which, I feel convinced must have experienced its full force. This evening the sun again set in a bank, the centre of the storm then bearing about west: the clouds in that direction were lit up as before with reddish tints, but of a softer look, the moon though surrounded by a large halo had resumed its normal appearance, but the same filmy sky existed as on the previous night:—eight p.m., barometer 30·076, thermometer 82·5°; wind S. 13° E., force 2 to 3; heavy swell from W. by N.

September 6th.—Eight a.m., a very cross confused and pyramidal sea, the waves running together from *all* directions, but principally from west; head N. 37° W., barometer 30·126, thermometer 81·9°, wind S. 60° E., force 5. Considered that we were now crossing the track of the vortex of the storm. Though the weather had still a somewhat unsettled look, the general appearance indicated a gradual restoration of the atmospheric equilibrium. Noon, 20°53′ N., 54° 0·8′ W., sea much troubled and running in all directions, but now principally from E.S.E., showing that we had crossed to the northward of the axial line; barometer 30·136, thermometer 83°, wind S. 63° E., force 3. At eight p.m., the barometer had risen to 30·150, thermometer 82·8°, wind the same in force and direction; the sea had perceptibly subsided, the sky looked bright and clear, and the moon, now approaching the full, shone brilliantly: occasional light showers seemed to clear the air still more, and no trace of the storm remained, if we except the still ruffled surface of the sea.

September 7th.—Eight a.m., steady breeze at east, force 4, the Trades having resumed their sway; barometer 30·228, thermometer 80·4°; fine clear weather, moderate swell from the two opposite points of east and west, the latter slightly predominating. Noon, latitude 23° 18′ N., longitude 56° 3′ W., barometer 30·214, thermometer 80·4°, wind S. 88° E., force 4, fine pleasant weather.

From the foregoing it will be seen by those versed in the law of storms as propounded by Piddington, Redfield, Reid, and others, that the *Halley*, steering N. 39° W. (true) at an average speed of seven knots, was crossing the wake of a revolving gale, which passed her bow some 170 or 180 miles in advance of her position, as was proved by the violently agitated state of the sea between eight a.m. and four p.m. of September 6th. We had, therefore, good cause to be thankful for having experienced head winds during part of the passage, which retarding our progress somewhat, probably saved us from a much worse infliction.

It will be seen by reference to the register, that on September 10th, the vessel was saved from running into a circular storm passing up between Hatteras and Bermuda by heaving to on the starboard tack. This may have been the same storm as that above referred to. Calculating its rate of speed, and knowing that the majority of these storms recurve to the N.E., I came to the conclusion it was one and the same revolving gale.

S. T. S. Lecky.

P.S. (to Captain Toynbee's letter)—Although we have no data of the September hurricane avoided by Capt. Lecky, excepting what he collected at New York, and mentions in his letter, the following extract from a letter by Capt. Stuart, of the Bahamas lighthouse tender *Richmond*, shows that cyclones were numerous in October.

The small chart by Lieut. Bourke, R.N., gives the position of the centre of the cyclone as estimated by observations of wind and barometer taken at Nassau, which observations are written on the radial lines connecting Nassau with the supposed centre of the hurricane.

Besides this charted cyclone, according to Capt. Stuart's letter, Cay Sal seems to have had bad weather some days earlier, viz., on the 6th, so that they were probably visited by three cyclones between the 6th and 20th October. H. T.

Schooner *Richmond*, Nassau, N.P.,
14th November, 1870.

Dear Sir,—I regret to have to report that we were compelled to cut away our masts in a cyclone on the 20th October, between the coast of E. Florida and the Little Bahama Bank. We arrived off the Cay Sal Bank Light on the 18th and were supplying the keepers with provisions, fuel, and water, of which they were deficient, having lost nearly everything by either a stationary cyclone or by two which followed each other in quick succession from the 6th to the 13th of October. We had boisterous weather the whole of the month of

October, the weather experienced at Nassau from the 6th to the 14th showed that there was a cyclone raging to the south and in our neighbourhood, but we have not had any report from places east of Cardenas, and do not yet know what has become of the Cay Lobos light.

I enclose a tracing of a chart showing the probable track of the vortex of the cyclone experienced between the 8th and 13th of October, drawn by Lieut. Bourke, of H.M.S. *Philomel*, he having boarded the ships mentioned on the chart and got extracts from their logs. I am, Sir, etc.,

W. H. Stuart.

ON THE LOSS OF H.M.S. *CAPTAIN*.

By Andrew A. W. Drew, M.A.

In this unhappy ship an attempt was made to combine all the great qualities which other competitive vessels were known to possess, without sacrificing any of those essential points which her inventor deemed absolutely necessary; and the result has been her total loss!

In similar cases it is usually possible to fix the blame of such a catastrophe upon some one person, either the captain of the ship, the officer of the watch, the builder, or the designer of the vessel, but in this case it is not possible to lay the blame upon any one pair of shoulders! This will perhaps seem paradoxical when it is further stated that the error which led to the loss of the *Captain* was in the design itself. It is well-known that many eminent ship-builders, and among them the late Chief Constructor of the Navy, declared upon an examination of the specifications for the construction of the *Captain*, that the problem set before them for solution was an impossible one, if they were to be tied down to each requirement.

Some would undertake its solution "if a knot less speed would be accepted;" some "if the specified dimensions might be increased;" and some "if less weight might be carried;" but no one, save Mr. Laird, was able to produce a design which could pretend to satisfy all the conditions of the inventor of the system. Experience has since proved that even Mr. Laird was mistaken in fact, although he may not have been aware of this until the loss of the ship gave him the information.

It is very probable that, in working out the design, the question of stability under sail was subordinated to that of speed under steam, and carrying capacity; but for any to assert that either the inventor or the designer of the *Captain* knew beforehand that their ship would be incapable of standing up under sail is, with all the facts of the case before us, an absurdity.

Similarly, to assert that the Controller of the Navy or the Chief Constructor had positive knowledge of the instability of the ship as she went to sea, is to ask Englishmen to believe that which all feel to be an impossibility. And accordingly we now at last have it plainly stated by the late Chief Constructor that he had *not* this positive knowledge (as he would have had in a design of his own), but merely had fears that the problem professed to have been solved by Mr. Laird in the *Captain must* have some undiscovered defect.

It will be within the memory of all who have taken an interest in our Ironclad Navy that the *Captain* was intended to be as nearly as possible a competitive design to that of the *Bellerophon*, the latter a broadside ship, the former a turret ship; and there was in consequence a great objection to the dimensions of the *Bellerophon* being increased in the *Captain;* the draught of water was to be less, the speed the same, and the fighting powers greater. It is beside the purpose to descant upon those points in which the *Captain* was proved to be a success, because these can be again secured by a similar design. That, however, which does concern us is, Why was the *Captain* deficient in stability? And the answer which must be made is this, "She was of necessity wanting in stability, *because* all other good points had been secured," since those peculiarities of construction which are favourable to great speed under steam, lightness of draught, and great carrying capacity, are antagonistic to stability due to form of hull beneath the water, and *vice versâ*.

Now, in practice, there are two different methods by which stability under sail may be secured; first, by virtue of a power inherent in the form of hull beneath the water resisting the effort to capsize the ship, and next by means of ballast, placed low down in the ship, whereby the centre of gravity of the whole body is lowered far beneath its normal position without such ballast; and by either of these means a ship may be made perfectly stiff under sail! This rule even holds good as regards a vessel which without ballast and without any lateral pressure would capsize. Such a ship may yet be made perfectly safe under sail by the use of ballast. The converse of this rule is also true, that a ship naturally safe *by form of hull* may be rendered utterly unsafe under sail pressure if

the centre of gravity is raised too high by means of high placed weights, such as turrets on deck, armour plating, etc. Therefore, where such high placed weights are necessary it is a *sine quâ non* that the form of hull shall be such as will naturally resist lateral pressure.

In the *Captain* it was inevitable that there *must be* a high centre of gravity, from the very nature of the case involved in her armament and armouring, and yet the form of hull was such as no sane man would ever dream of calling suitable for a sailing ship. That it was suitable for carrying the enormous weights required, upon a comparatively small draught of water, and also for obtaining a high rate of speed under steam, is not to be denied, since it did meet these requirements; but, on the other hand, that it was not suitable to resist sail pressure is proved by the fact that, under trial, it was unable to do so.

Lowness of freeboard had little or nothing to do with the question; and, in fact, the *Captain*, as built, with her 6ft. 6in. of freeboard, was positively less liable to capsize than she would have been had her intended freeboard of 8ft. been preserved. The reason of this is, because, by the extra immersion, the centre of gravity of the ship was positively lower than as calculated, and therefore the vessel made by so much safer under sail. That this fact is known at the Constructor's department of the Admiralty is proved by one of Mr. E. J. Reed's letters, in which he refers to his fear that the *Captain*, when light from consumption of coals and stores, would be extremely crank under sail—that is to say, that when her freeboard was increased her stability would be decreased. Hence, by Mr. Reed's own showing, it does not of necessity follow that the greater the freeboard the greater the stability.

If this were really so, as the champions of the broadside principle assert as against the low freeboard turret system, then we should find deeply-laden merchant vessels capsizing on account of the lowness of their freeboard, whereas the stability of these is such that their masts may be blown out of them, but they can hardly be made to heel over at all. On the other hand, nothing is so common as for an insufficiently ballasted merchant ship, with an extremely high freeboard, to be capsized in a squall of wind, even without a heavy sea. A too deeply laden ship may founder for want of buoyancy, being too sluggish to rise to the waves, but she certainly will never capsize on account of the lowness of her freeboard.

It has already been shown—at all events, by inference—that the naval architect's and the mechanical conditions of stability are secured by exactly opposite means, so that if both sets of conditions

are neglected (as in the *Captain*), the result is inevitable, and the ship must of necessity capsize when hard pressed by sail. This is why the ill-fated ship is so often said to have gone to the bottom "just as she ought to have done, according to all mathematical demonstrations!"

The naval architect will say, if a given design for a ship is likely to produce a vessel deficient in stability, increase her beam, and the stability will at once be increased also; but then he knows that in doing this—*i.e.*, by increasing the area of the midship section—he loses speed, and adds to the tonnage of the vessel. The mechanic will say, increase the draught of water and lower the weights, and this will give greater stability under sail; but he, too, knows, or ought to know, that this will decrease speed, etc.

Now the design of the *Captain* fulfilled neither of these requirements, for her beam was small indeed, in proportion to her length, as compared with any sailing ship ever yet designed, while her draught of water was actually less than that of any other ship of her own tonnage, and her double bottom still further reduced her real draught of water, as regards the possibility of placing any of her heavy weights sufficiently low down to act as ballast.

Added to this the form of midship cross section of her hull was about as unlike that of any known sailing vessel as it could have been, and therefore presumably as unfit to be applied to a ship intended to sail in a gale of wind as it could have been.

Several causes have conduced to that vicious form of bottom introduced in all ironclad ships, which has rendered them entirely dependent upon judiciously placed weights for that small amount of stability under sail which they do possess. One cause has been the necessity for carrying immense weights upon a limited draught of water, and another the obligation to command a given high speed under steam. Under these modern requirements anything like wholesome bearings have been discarded, and mere iron boxes with sharp ends have been put together, which are all very well as long as they can be kept under steam, while the use of the good old fashioned keel (the salvation of every sailing ship) has also been abandoned, partly in order to decrease by a few inches the draught of water, and partly for facility of docking.

If it is wished to produce, what is perfectly possible, a safe sea-going turret ship with low freeboard, such as the *Captain* was supposed by her inventor to be, it will be necessary to revert to the form of hull adopted in our finest sailing frigates, although in order to do this a new *Captain* must be perhaps 1000 tons larger than her ill-fated namesake. Many there are who will contradict the

principles here advocated, and deprecate the re-introduction of old forms of hull, besides asserting the uselessness of keels to add to stability; but if this is so let them go and take a lesson in ship-building from some of our best yacht builders. Let them pay a visit to Ratsey's yard, at Cowes, and study the lines of the *Livonia*, or of any other yacht of small tonnage, which can nevertheless stand up against a pressure of canvas sufficient to capsize an iron-clad modern ship.

Let them ask any yacht builder why, in order to obtain great stability, he departs so widely from the Whitehall models, why he insists upon giving his vessels such bearings and such deep keels, and his answer will be, because I find by so doing I can make my vessels do the work under sail which Whitehall never does or can. It is a slur, no doubt, upon modern naval architecture to find that we have advanced too far, and that if we still desire to have our ships really safe under sail, we must go back to principles known to our forefathers, successful under their hands, but too hastily abandoned by us, their sons. Yet the safety of our sailors and the efficiency of our Navy equally demand of us a re-consideration of our principles of naval architecture, seeing that the finest ship in our fleet capsizes under double reefed topsails in half a gale of wind.

FLAGS AND ENSIGNS OF WAR.

GENTLEMEN in former times indicated their noble birth, not only by assuming coats of arms such as had been borne on the clothing and shields of their ancestors, but likewise by emblazoning their, or their family's, claims to honour, in determined figures and colours upon banners which were carried before them as marks of personal distinction. The banner thus carried attested that its owner was a person of rank,—a chief, in all likelihood, who had furnished a certain number of fighting men for the service of the State,—and was regarded as a symbol of power. The early Britons adhered punctiliously to their quaint law, that no petty chief should clip his beard till he had either slain his enemy or taken his standard from him. This was, amongst the primitive British soldiery, the quintessence of the "etiquette" of war. The ensign, then maintained as a mark of social distinction, has come down to our own times under the form of the more generally adopted "crest,"

Circular No. 451.

BOARD OF TRADE,
January 1871.

INSTRUCTIC

TO

SUPERINTENDENTS OF MARINE OFFI

International Code of

The Board of Trade have had their atter
uniformity in the system of signals used at
Kingdom to denote the depth of water to sl

In some cases ships have been stranded
a signal displayed. These mistakes arise
tidal signal which is hoisted at one port to
the harbour is safe for a vessel drawing a
be employed at another port to convey a
contrary signification.

THOMAS GRAY.

Table next page.

and the curious standard adopted by the Northumbrian king Edwin—a description of which is given by the venerable Bede—as symbol of his royal state, was peculiarly similar to the kingly sceptre of modern days.

Our Royal Standard's pedigree is a long and noble one, and traces its descent in a direct line from the Conquest, setting forth in its lions (two of which were the arms of Normandy) and its fleurs-de-lys, the French pretentions of the descendants of the Norman Duke. Strange, that the very lions that confronted Saxon enmity at Hastings were silent witnesses to the scourging of French arrogance at Waterloo! The Standard, as now displayed, having rejected the escutcheon of pretence placed in its centre by William of Nassau, and likewise the additions under George I., unites to the arms of France and the imperial ensigns of Great Britain, the silver-stringed golden harp of Ireland, from which rang many a sorrowful note into the strong lion's unsympathetic ear. Portraits of this Standard are to be seen at Windsor and in Greenwich Hospital, in the authentic paintings of the "Great Harry" and the "Henri-Grace-de-Dieu" war ships, looking out of the canvas from the mast-heads of these vessels, old as the Norman arches of the Palace, and as time-worn veterans of public service as the tried and weather-beaten Pensioners on the grateful bounty of the nation.

William of Normandy and Pope Alexander II. exchanged significant compliments through the medium of flags. Previous to the battle of Hastings, the Duke, in order to propitiate his Holiness, promised to hold the kingdom of England, when he got it—and of the getting his resolute mind was assured—of the Apostolic See. Alexander justified his pretentions, and, as sign of gracious encouragement and in token of good will, sent him "a white hallowed banner" with which to decorate the prow of his ship, an Agnus Dei of gold, and one of St. Peter's hairs, together with his blessing. The Saxon Standard represented a warrior, beautifully wrought on silk, woven in gold and adorned with very precious stones. Beneath it, Harold, and his brothers Gurth and Leofuric, and the best of Saxon nobles, spilled their blood. The defence of the Warrior, that piece of gemmed-embroidered silk, meant the defence of priceless Saxon honour and liberty, set fast in its stones and meshed in all its threads. No less than twenty Norman knights rushed forward, as Harold fell, to seize the Warrior, which was sent after the battle, by William to the Pope, as sign of victory and in return for the white flag, the Agnus Dei, and the one hair from the head of Saint Peter. A century and a half later his unworthy descendant

laid the English crown at the papal nuncio's feet, and the English heart then throbbed with a mightier pain than when the English soil was first trodden beneath the Norman heel, and the banner of English freedom floated in the palace of the Vatican.

Enthusiasm and reverence attended certain Standards to so great degree that mention of them cannot fairly be omitted in works relating to the periods in which they were erected. The Labarum, the famous Standard which displayed the triumph of the cross under Constantine, finds place in the splendid pages of the "Decline and Fall." This device, a cross surmounted by a crown enclosing the "mysterious monogram" of the initial letters of the name of Christ, and inscribed with the words, "By this Conquer," is said to have been dictated to Constantine in a vision by Christ Himself. To its influence the Emperor attributed solely the success of the Milvian bridge. To elevate it in battle, was to animate the soldiers to heroic and invincible enthusiasm and to scatter terror through the ranks of the enemy. Fifty men of approved valour and fidelity were its body-guard, and superstition declared this guard invulnerable. Eventually it was "pensioned off" to rest, venerable and revered, in the palace of Constantinople, and its honours were commemorated on the medals of the Flavian family. Renowned scarcely less than the Labarum was the unwieldy "Carroccio" of the Lombards. The free citizens of Northern Italy recognised no disgrace more intolerable than that entailed by suffering an enemy to take the Carroccio. This extraordinary Standard owed its celebrity to the inventive genius of Erihert, Archbishop of Milan, who must have resolved on out-standarding the Standards of his foes. It was a heavy car on four wheels, painted red, in the centre of which was fixed a mast, and was drawn by eight prize oxen. The mast supported a golden ball, an image of our Saviour, and the banner of the Republic. From the platform of the car, Erihert and his successors administered to the spiritual wants of the army, surrounded by a guard of valiant warriors, the while martial music played.

In the year 1138, the English originated a Standard which outdid Erihert's. The "Battle of the Standard" owes its name to the clumsiest round which the British army ever gathered—to wit, a huge cross fastened to the mast of a vessel, which was decorated with the banners of three English Saints and mounted upon a waggon. In the centre of the mast was fixed a small silver box containing the consecrated wafer. The *tout-ensemble*, waggon, mast, Saints, cross, and box—was dragged into the centre of position and became the rallying point of the battle;—the only

redeeming feature of which clumsy construction being, it seems reasonable to infer, that it was big enough to defend itself.

It is curious to note the fanaticism demonstrated in the banners adopted at different times. Beneath the holy banner of the cross perished, in awful numbers, the superstitious, the devoted, the dissolute, the ambitious, the needy, the criminal, the good—for "to engage in the Crusade and to perish in it," says Hallam, "were almost synonymous." Each Crusader wore on his dress a large cross, the symbol of the sacredness of his mission—a fashion copied in Henry the Eighth's time in a rising of the peasantry known as "The Pilgrimage of Grace." The "Pilgrimage took place north of the Humber, at the instigation of the outraged priests, who somewhat objected to the suppression of the Monasteries—and also joined in the rabble, carrying crosses. The banner borne in the midst of the procession displayed on one side the Redeemer, on the other the host and chalice. Every pilgrim had wrought on his sleeve the name of Jesus surrounded by His five wounds. The Pilgrimage was quickly and quietly put an end to by military force, and the Pilgrim Chief, one Robert Aske, suffered death on the gallows at York."

Poor Jeanne d'Arc had a banner made after her directions with a figure of "God the Father" upon it, which she caused to be consecrated in the Church of St. Saviour, at Blois. The figure represented God as a venerable old man, bearing in his hand a globe, encircled by the national fleurs-de-lys, strange type of the girl-soldier's belief in providence and patriotism.

The Knights Templars, who undertook to maintain Christianity and chivalry at the sword's point, carried a banner known by the name of Beau-séant. This banner, equally divided into black and white, signified that the order to which it belonged could be "fair and candid towards Christians, but black and terrible towards infidels."

The flags that fluttered on the field of Crecy portrayed, quaintly, the deadly animosity then existing between the rival nations. The French banner "Auriflamme" signified, according to Stowe, "no mercy more than fire in oil." This banner had in lilies of gold "very broad," and when by the king's command it was set up, it was held not lawful, under penalty of death, "to take any man to save his life." On the other side, Edward desired his banner "to be erected of the dragon, which signified fierceness and cruelty to be turned against the lilies,"—and we remember how the fiery breath of the dragon blasted the glory of the golden lilies on that day.

There is a story given in Codrington's "Life and Death of Robert Earl of Essex," reprinted in the Harleian Miscellany, of a hot-headed royalist who devised a flag for his party, and so successfully irritated the grave representatives of the people, that his device was punished with exile. It happened that Essex, journeying to Tewkesbury, after the siege of Gloucester, met with two regiments of the king's horse, which were but "newly entered into service." One of their Standards represented the houses of parliament, on the top of which were the heads of two traitors fixed on two poles, and beneath which ran the inscription, "Sicut extra, sic intra," the indignity whereof, we are told, "left such a just expression of disdain in the breasts of the parliament, that it was voted the contriver of this ignominious invention should be strictly searched out, and being known he should for ever be banished the kingdom as unworthy to live in the English air." It is added—"This good service was performed about two of the clock in the morning."

The coins and seals of the time of Edward III. are impressed with the figure of a ship, bearing at the bow and stern a flag stamped with a plain cross, and the portrait of the "Great Harry" exhibits the same cross at the fore and mizen. This, the pet of English flags, the darling of the navy, was the parent Jack—or Jacques—from which our famous Union-Jack has sprung, and which now represents in the three united crosses of the National Saints, George, and Andrew, and Patrick, the unity of three sister kingdoms under the one crown.

The first instance upon record in which the "Jack" received direct indignity, is given with much bitterness in Weldon's "Court of King James," and happened when as yet the cross, of homely and familiar name, was single. A Dutch man-of-war meeting in her passage with a "king's ship" would not *vaile* (*i.e.* strike her flag and lower her topsails) as the manner was, "acknowledging by that, our sovereignty over the sea." The commander of the "king's ship," Sir William Monson, gave the commander of the Dutch vessel "a shot to instruct him in good manners, but instead of learning, he taught him, by returning another, that he acknowledged no such sovereignty." This was the very first indignity and affront ever offered to the royal ships of England, "which since then," moans the writer, "have been most frequent." The defied English admiral was often heard to wish he had been hanged, "rather than live that unfortunate commander of a king's ship to be chronicled for the first that ever endured that affront"—an affront for which the easy-going James exacted no reparation,

though it directly infringed the treaty of Breda, wherein (Art. 19) it was provided that any ships and vessels of the United Provinces meeting English men-of-war in the British seas should acknowledge the supremacy of the English flag;—the flag, that, silent through generations, spins us stirring yarns of the Armada and Trafalgar; that remembers the defeat of Philip and the death of Nelson; that rides the ocean like a lasting monument to the glory of the great Saxon founder of English maritime power;—that has grown to be that upon which, in our military decline, we lay the chief weight and burden of our honour; that, giving fair margin to poetic license is, revered and loved,

"The flag that braved a thousand years,
The battle and the breeze."

MAR TRAVERS.

SOCIETIES,

MEETINGS, ETC.

ROYAL UNITED SERVICE INSTITUTION.—On the 23rd January an excellent paper was read by Commander William Dawson, R.N., on "The Use of Torpedoes for offensive Warfare." The author treated, in the first part of his paper, upon the experiences and inventions of the Americans, both Confederates and Federals, during the Southern States war. After which he dealt with the inventions which had been practically examined in this country by our naval authorities —the outrigger system of attack, Commander Harvey's sea torpedoes, Hale's rockets under water, and submarine locomotive torpedoes of the Whitehead or "fish" class. In these remarks he commented in the most favourable manner upon Commander Harvey's weapons and the system of using them, viewing them as most formidable in attack and most difficult to be avoided. The first obvious effect of the great danger involved in a near application to a hostile ship, however seemingly weak, would be to put a stop to ramming and boarding altogether. To attempt to ram or board even a ship deprived of motive power, but bristling with outrigger torpedoes, would be so hazardous an enterprise, that only the Harvey towing torpedo or gunnery could be employed for her destruction or capture.

Though Commander F. Harvey's divergent towing torpedo has

not been put to the test of actual war, we have this great advantage in forming an estimate of its value, that unlike the plaything called an outrigger torpedo, in the *Excellent* and *Cambridge*, Capt. Harvey's experiments have been conducted with the actual apparatus which have been supplied to various navies for the purposes of real war; and it is so simple in its construction, and self-evident in its manipulation, that any intelligent seaman can easily comprehend it, though skill and experience will be called for in the handling of the ship, to determine the great variety of applications of which it is susceptible. The towing torpedo is essentially a sea torpedo, and can, undoubtedly, be used in any weather, and at any speed over four knots. This last proviso marks it as less applicable than the outrigger torpedo boat service, and for the ordinary conditions of harbour attacks, when explosions must often be effected whilst the attacking vessel is stopped or running very slowly. The circumstance that it can be used in all weathers, at all greater speeds, and at a distance of at least 300 yards, marks it out as especially valuable just where the outrigger fails. Thus every sea-going steamship, man-of-war or mercantile, might, in the event of a maritime struggle for existence, be armed with such a weapon in addition to her other powers of resistance.* Commander Dawson concluded by strongly urging the necessity for prompt and energetic action on the part of the administration, to discover the best kind of weapons for naval warfare, and to instruct officers in the use of them.

Royal Society.—On the 6th of February a paper was read by Sir William Thomson on "The Determination of a ship's place from Observations of Altitude," a special report of which we hope to give in our next number.

On Thursday evening, the 9th, an important paper was read by Mr. E. J. Reed, C.B., the late Chief Constructor of the Navy, on "The unequal distribution of weight and supports in ships, and its effects in still waters, in waves, and in exceptional positions on shore." The author stated that the introduction of steam as a propelling agent, and of largely increased lengths and proportions for ships, has brought about a comparative distribution of weight and buoyancy very different from that formerly contemplated. Taking the cases of three or four typical modern ships, the relative distributions of the weight and buoyancy were carefully and fully calculated, and graphically recorded. Only the most

* We may mention incidentally that Commander Harvey has been awarded by Government the sum of £1,000 for his invention.—Ed.

meagre and unsatisfactory attempts to measure and exhibit the actual strains of ships have previously been made, and the author's results are wholly unlike any that have before been published.

The first case was that of the Royal yacht *Victoria and Albert*, which represented the conditions of long fine-lined paddle steamers, with great weights of engines and boilers in the middle. The second case was that of the *Minotaur*, which represents long fine-lined ships with great weights distributed along their length. The iron-clad *Bellerophon* was the third case, representing shorter ships, with fuller lines, and very concentrated midship weights. The last case was that of the *Invincible* class, in which the weights of armour, etc., are still more concentrated. The smooth-water strains of all these ships were illustrated by numerous diagrams embodying the results of various calculations, and the effects of placing such ships among waves were then no less fully investigated. The great bulk of the paper consisted of detailed calculations, but some of the facts and figures deduced were very striking. It was shown, for example, that a ship like the *Minotaur*, floating among waves 400ft. long and 25ft. high from hollow to crest, which have a time of transit of about $8\frac{3}{4}$ seconds, passed in half that time from a bending or breaking "moment" of 140,000 foot-tons tending to break her in two by the dropping of the ends of a reverse strain of 74,000 foot-tons, so that fifteen times per minute a "wave of strain," as Mr. Reed designated it, having these enormous quantities for its positive and negative amounts, sweeps through the fabric of her hull. The *Victoria and Albert* yacht has to undergo, in like manner, strains which tend to break her downwards at the ends with a force of 16,400 foot-tons, and in less than four seconds encounters a strain tending to break her downwards at the middle, and let her engines and boilers fall through her, equal to nearly double this amount, or 31,000 foot-tons. It is remarkable that this change of strain in this lightly-built hull is proportionately greater than that of either of the ironclads. The *Bellerophon's* maximum strain in waves, similarly calculated, were 43,600 foot-tons and 48,800 foot-tons respectively. In illustrating the influence which rapid changes of strain exert upon structures, the author referred to the experiments of Sir W. Fairbairn, who has shown that the joints of an iron-riveted beam broke under the action of a rapidly-alternating strain, although it was only one-third in amount of what the beam would sustain at rest. Mr. Reed stated that his investigations had shown many of the general principles laid down by former investigators, who had dealt with very different forms of ships, to be erroneous, and, in particular, opposed the very common notion that there is a

compensating action between the strains of, and the wave actions exerted upon, very long fine-lined vessels. He further stated that while the weakness exhibited by many modern ships had induced him to enter upon these investigations, the result of them had been to convince him that calculations which had hitherto been neglected were becoming daily more and more necessary, especially as the length of steamships and the lightness of their construction in iron and steel were being very rapidly and simultaneously developed.

ROYAL INSTITUTION.—On Friday, the 10th, a lecture was delivered by Mr. E. J. Reed on "Some Fallacies connected with Ships and Guns." With regard to the fallacies connected with ships, Mr. Reed said that he intended to speak chiefly of the stability of ships, so much attention having been drawn to this subject in consequence of the loss of the *Captain*—there being, therefore, a necessity for the recognition of the real cause of the loss to prevent the recurrence of such a catastrophe. A ship floating in still water was held in equilibrium by two forces—the downward force of gravitation, and the upward resistance of the fluid, or the force of buoyancy. While the ship is at rest in still water these two forces act in a straight line with each other; but suppose an external force to incline the ship to one side, they would no longer act in the same vertical line, and the more the two lines were separated the greater was the stability of the ship. Having premised these conditions, Mr. Reed contrasted the stability of the *Captain* and the *Monarch*, explaining by diagrams that, if the *Monarch* leaned over as much as 49 degrees, she would still have considerable righting power, whereas the *Captain*, under the same conditions, would have had very little. Directly the low side of the *Captain* passed under water, her buoyancy was continually diminishing; she had nothing left in the shape of buoyancy to put in the water; so, then, she had no alternative but to sink bodily downwards to a certain depth, till the balance was restored. The *Monarch*, at 28 degrees of inclination, would be in very nearly as good a position as the *Captain* at 14 degrees. It had been said that, if the *Captain* had been ballasted at the time of her loss with the water ballast, for which means were provided, her stability would have been increased; he admitted that this was the case to a limited extent, but it would not alter the shape of the curve of her stability, whereas in a ship like the *Vanguard* the introduction of ballast greatly altered the curve, and increased her stability. With the *Captain* it was entirely different; and her loss arose from her having a low side, and not a high freeboard. She had a very small reserve of stability, and she was in special danger

from sudden squalls. The *Captain* had a double bottom, with buoyant spaces between; and some persons complained that this was a source of danger. If the outer bottom had been taken away, she would have been in a much worse condition than if it were left in its place; if the inner one had been taken away, it would simply have set free some air which was shut up. He had yet to learn that there was some mysterious difference between shut-up and free air, which would involve the loss of a ship.

With regard to the fallacies connected with guns, Mr. Reed considered that any and every argument which led to the use in the present day, of bronze as a material of gun manufacture was fallacious. Gun-bronze is a material having a tensile strength of only seventeen tons, which is considerably less even than wrought-iron, and not half the strength of steel of suitable ductility. He considered it wrong to use an inferior metal, when one possessing all the strength of steel in association with the necessary ductility was produced. He was also of opinion that the Navy should be furnished with guns and projectiles of greater range and accuracy than the present, and firing longer projectiles. It was not right to contend, as some did, that because the platform of a ship was not absolutely stable inferior accuracy in guns should be tolerated.

ROYAL GEOGRAPHICAL SOCIETY.—The sixth Meeting of the present Session was held on Monday Evening, the 13th of February, Major-General Sir Henry C. Rawlinson, K.C.B., Vice-President, in the Chair.

A letter was read from Mr. Churchill, Consul at Zanzibar, mentioning the despatch of further stores and men to Dr. Livingstone, who was stated to *have arrived* at Ujiji from his journey to the country of the Manime or Manyema, a cannibal tribe to the west of a new lake beyond Tanganyika. The Chairman remarked that Mr. Churchill's letter was of older date by three weeks than the one from Dr. Kirk, communicated by Sir Roderick Murchison to the "Times," in which the traveller was said to be expected at Ujiji, but not to have actually arrived there.

A paper was read on "The Great Kaietuer Waterfall of British Guiana," by Mr. Charles B. Brown, of the Geological Survey of the Colony. This lofty and picturesque waterfall was discovered by Mr. Brown in April, 1870, whilst descending the Potaro, precipitating itself over the edge of the sandstone table-land of the interior into the lower country of the Essequibo Valley. He was sent by Governor Scott, in June, to make a second visit and obtain accurate measurements of the falls, and was then accompanied by Sir George

Young, Mr. Mitchell, and Mr. E. King. The total height was found to be 822 feet; the width of the river at the edge of the fall 123 yards; and the depth of water near the edge fifteen feet two inches, the level being at that season five feet below that of the rainy season. Mr. J. G. Sawkins, the Director of the Geological Survey of British Guiana, exhibited a series of most effective water-colour drawings of the falls and neighbouring country, and mentioned the peculiar character imparted to the scenery of the country by the long flat-topped mountains with precipitous sides. Mount Roraima was the most remarkable, rising like a huge mass of masonry above the surrounding country. Its height was 7,500 feet above the sea-level, and its length, as shown by Mr. Brown, eighteen miles; the level summit is inaccessible to man, and upon it rise tributaries which flow different ways to feed the Essequibo, the Orinoco, and the Amazons; these streams, in descending from the plateau, form in some cases waterfalls having a leap of 15,000 feet.

NOTICES OF BOOKS.

Traverse Table, with a simple and brief method of Correcting Compass Courses. By R. A. Edwin, Lieutenant, R.N. Portsmouth: Griffin and Co. 1871.

To those who require to make use of a Traverse Table we heartily commend Lieut. Edwin's painstaking compilation of calculations. The endless columns of figures represent a great deal of work, and the apparent correctness and reliability of the calculations are really worthy of the confidence of nautical men.

As regards the method for correcting compass courses it is simple, and when once thoroughly comprehended will probably be found to be easily workable. We are inclined to think that in the minds of some sailors the words "deviation" and "variation" will be jumbled together and mistaken one for the other. Forty years ago the deviation of the compass used to be tabulated from the magnetic north for every point, and was called a "table for corrections for local attractions," plus or minus to bearings or courses round the circle according to the direction of the ship's head. Lieut. Edwin adopts the circular system, but he carries the notation from 0° to 360° without regard to points. The plan may be easier

when once known, but we doubt whether seamen will be inclined to give up the connection with points and go in for mere figures. To a nautical mind such a method would seem to rob it in a measure of its practical application.

Colonial Questions pressing for immediate Solution. Papers and Letters. By R. A. Macfie, M.P. London: Longmans and Co.

Cosmopolitan ideas and tendencies are often derided and condemned because of their seeming inconsistency with what is called patriotism and national feeling. Sometimes the derision is deserved, especially in the case of those who begin at the wrong end of things, and profess interest with the large before they have done their duty on the platform of the small, and go in for sympathy with universal humanity before they have educated their affections within the limitations of home and country. Notwithstanding however this tendency to mistake as to the process, it seems to us clear that the end and intention of nature and Providence is to lead us onward and upward from small sympathies to large ones, from private, personal, and patriotic regards to aims, purposes, and desires that gradually approach to universality. "Of one blood hath He made all the nations of the earth" is a truth not all at once appreciated and felt by any one, but it is discerned by degrees, and by degrees comes to be acted upon, and to shape and colour the policy of man to man and of country to country. A cosmopolitan thinker would say that Colonies exist primarily for the relief of the parent State, secondarily for their own good and benefit, and finally, for the general benefit of humanity. Mr. Macfie—the ardency of whose feelings is rather more obvious than the clearness of his reasoning—holds to the doctrine that a parent State should never part with its colonies, but keep them to the apron-string, not of course neglecting their happiness and prosperity or treating them with any degree of hardness or hauteur, but still maintaining the connection with a view mainly to the strengthening and enlargement of Imperial power and influence. Dr. Lang whose work is copiously and candidly quoted in this pamphlet is of a different opinion. He appears to think that all large Colonies must ultimately seek separation and independence, and that they should be encouraged to seek it, and that when that separation is effected in the ripeness of time and in the spirit of friendliness and good-will, the ultimate moral advantages (and incidentally the physical advantages also) to the parent State are greater than those which would have accrued from continued dependence and subordination.

We confess that to our thinking Dr. Lang has the best of the argument; and though it may be possible to countervail his reasoning by reasoning still more weighty, that is certainly not done within the pages of this pamphlet. The opposing thinkers occupy different stand-points. One plants himself in England and thinks of *her* influence, *her* reputation, *her* prestige, and *her* family resources; the other places himself in the colonies and thinks of *their* power, *their* prosperity, *their* freedom, and *their* capacity to unfold into greatness and grandeur. One is thinking of the glory of the parent, the other of the good of the child. Both mean well; both are earnest and sincere; both would deprecate and condemn the alienation of a colony by injustice and neglect, and both would say that if separation is to be effected at all, let it be done in the fitting season, when things are ripe for detachment and separation, not in the early days of bud and blossom. It may seem very hard for an old state to have to say to its colonial child, "Thou must increase and I must decrease;" but looking over the centuries, it seems a part of the Providential plan that at intervals, more or less wide, seats of empire should be changed and civilization take new centres of radiation and new forms of expression. We may possibly mistake the diagnosis and symptoms of the case, and sometimes act too early for the good of the one party, and sometimes too late for the peace of the other; but when once the indications and evidences of change are apparent and clear, there is, as it seems to us, no other duty but cheerful acquiescence and earnest endeavour to transmit into the new the best qualities of the old.

With regard to emigration to the United States and other parts of the world which are not dependencies of Great Britain, Mr. Macfie regards it as sheer calamity. If a calamity however, it is one that has ultimately its compensations in so far as it sows a British seed on foreign soil, and leads to the growth of peaceful affinities and sympathies instead of antagonisms and repulsions. Moreover, it is a thing that cannot be helped as regards that large class of emigrants who go out at their own expense and without public or parliamentary aid. They must be free to go where they will. Constraint is not lawful and lamentation is useless.

The entire question is a broad one, with moral bearings quite as important as the economical ones. This pamphlet contains some useful statistics and puts forth some truths. It is suggestive, but by no means exhaustive.

MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
7	British Columbia—Juan de Fuca Strait—Race Island.	Establishment of a fog bell.
8	Ireland—East Coast—Dublin Bay.	The tidal signals at Poolbeg Lighthouse to be discontinued.
9	Mindoro Sea—Palawan—East Coast	Shoal off Bold Point.
	Philippine Islands—Luzon—Manila Bay.	Alteration in Manila Light.
10	Mediterranean—Adriatic—Durazzo Bay.	Newly discovered shoals in.
	Spain—North Coast—San Vincent de la Barquera.	Establishment of a light on Point Silla.
11	United States—Salem Harbour.	Establishment of lights at Fort Pickering and Derby Wharf.
	„ Charleston.	Alteration in colour of lights.
12	China—East Coast—North Saddle Island.	Exhibition of light.
	Japan—Yokohama Bay.	Buoy on Kanegawa Shoal.
13	Adriatic—St. Cataldo Point.	Establishment of a new light.
14	Nova Scotia—Mahone Bay—East Ironbound Island.	Re-establishment of light.
	Bay of Fundy—St. Mary Bay—Sissibon River.	Establishment of a light.
	Gulf of St. Lawrence — Chaleur Bay—Bonami Point.	Establishment of a light.
15	Japan—Yedo Gulf entrance—Jokasima.	Establishment of a light, instead of a wood fire.
16	Australia—Victoria—Warrnambool Harbour.	Intended alterations in lights.

(All bearings are Magnetic.)

7.—*British Columbia—Juan de Fuca Strait—Race Island*—A fog bell has been established at the lighthouse.

8.—*Ireland—East Coast—Dublin Bay—Poolbeg Lighthouse*—The lower or tidal light, and ball, exhibited from this lighthouse, will be discontinued from the 1st April.

9.—*Mindoro Sea—Palawan—East Coast—Bold Point*—A shoal (*Constancia Shoal*), with $3\frac{1}{2}$ fathoms on it, sand and coral, has been discovered 15 miles E. by S. from Bold Point, in lat 9° 58½′ N., long. 119° 25′ E. The extent of this shoal is unknown.

Philippine Islands—Manila Bay—A new apparatus of the sixth order has been fitted to the Manila Lighthouse, entrance of Rio Pasig; the light is now a *fixed red* light, and should be seen from a distance of 9 miles.

10.—*Adriatic Sea—Durazzo Bay*—Notice of the existence of two shoal patches is given, viz.: One, with 8 feet water on it, North $2\frac{1}{3}$ miles from

the tower on Capo Laghi; the other, with 2 feet water on it, N. by E. ½ E. 3¾ miles from the same object.

Spain—North Coast—San Vincente de la Barquera Harbour—A *fixed red* light of the sixth order, elevated 142 feet above the sea, has been established on Point de la Silla, in lat. 43° 23′ 30″ N., long. 4° 25′ 50″ W. Should be seen from a distance of 9 miles.

11.—*United States—Salem Harbour*—A *fixed white* light of the fifth order, elevated 25 feet, has been established on the south-east point of Winter Island, near Fort Pickering, at the entrance of the harbour; also a *fixed red* light of the same order, at the end of Derby Wharf, at the town.

Charleston—The lights of Morris Island beacons, Weehawken light-vessel, and Castle Pinckney, are all changed to *white* lights.

12.—*China—East Coast—Saddle Islands*—The light on the north island is now exhibited; it is a *revolving white* light of the first order, elevated 265 feet above the sea, and should be seen 23 miles. Position, lat. 30° 50′ 20″ N., long. 122° 40′ E.

Japan—Yokohama Bay—A *red* buoy, with staff and cage, has been placed on the point of the spit extending from Kanegawa Fort; it lies S.E. by E. 1 mile from the centre of the fort.

13.—*Adriatic—St. Cataldo Point*—A *fixed* and *flashing white* light of the first order, showing a flash *every two minutes*, 218 feet above the sea, and visible 23 miles, has been established on Point St. Cataldo, near Bari, in lat. (as given) 41° 8′ N., long. 16° 51½′ E.

14.—*Nova Scotia—Mahone Bay—East Ironbound Island*—The lighthouse has been rebuilt, and exhibits a *fixed white* light elevated 150 feet above the sea, and should be seen 16 miles.

Bay of Fundy—St. Mary Bay—Sissibon River—A *fixed white* light, elevated 36 feet above the sea, and visible 8 miles, has been established at the entrance of Sissibon River, in lat. 44° 26½′ N., long. 66° 1¼′ W.

Gulf of St. Lawrence—Chaleur Bay—Bonami Point—A fixed white light 49 feet above the sea, and visible 13 miles, will be exhibited, during the season of navigation, on Bonami Point, south side of the entrance of Dalhousie harbour, in lat. 48° 3¾′ N., long. 66° 20¾′ W.

15.—*Japan—Yedo Gulf* entrance—*Joka-sima*—A *fixed white* light of the fourth order, elevated 106 feet above high water, visible from a distance of 9 miles, between S. by E. ½ E. round by East to N. by W. ¼ W., is now exhibited instead of the wood fire.

16.—*Australia—Victoria—Warrnambool Harbour*—On or about the 1st May, 1871, the light on Middle Island will be discontinued, and leading lights will be established in the positions of the obelisks in front of the town. The upper light will be a *fixed white* light, elevated 109 feet above the sea, and should be seen 14 miles. The lower light will be a *fixed red and white* light, elevated 87 feet above the sea.

The two lights in a line bearing N. ¼ E. will lead through the best water between the five-fathom bank and the foul ground to the north-westward.

NOTICE TO MASTERS AND OWNERS.—PROCEEDINGS TO BE ADOPTED ON BOARD VESSELS ENTERING THE PORT OF BORDEAUX. The subjoined copy of a despatch from her Majesty's Consul at Bordeaux, containing regulations recently published for the proceedings to be adopted by vessels entering that port, is printed for the information and guidance of masters and owners of vessels concerned.

THOMAS GRAY.

"Bordeaux, January 27th, 1871.

"SIR,—I have been requested by the Commissary of Marine of this port to make known to masters of British vessels the following regulation, recently published for the proceedings to be adopted on board of vessels entering the port; neglect of which may expose them to be treated as enemies' ships by the river forts. After clearance at Trompeloup, the quarantine flag is to be replaced by the ensign. At night, a light is to be carried at the peak besides the ordinary lights as far up as Trompeloup, and beyond it at the mainmast head. In approaching the forts, steamers must blow their whistles and stop and blow off steam before passing. In reply to the Commissary's letter, I have informed him that I have communicated these regulations to her Majesty's Government, but I have begged him to make the pilots put on board ships entering the river responsible for their execution, as far as it is dependent on them.

"I am, etc.,

"THOMAS CAREW HUNT.

"The Assistant Secretary,
"Marine Department,
"Board of Trade."

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, IN JANUARY AND FEBRUARY, 1871.

No.	Scale.		s.	d.
966	m = various	China Sea: Anchorages in Balambangan and Balubac Islands	2	0
2182a.b.	d = 6·0	North Sea, 2 sheets	6	0
2202a.b.	d = 0·6	South Atlantic Ocean, 2 sheets	7	0
2330	m = 0·7	Svenöer to Koster Islands, including Christiania Fiord	3	0

GENERAL.

SIR WILLIAM HARRISON WALKER.—Captain Walker, H.C.S., the Senior professional officer of the Board of Trade, has received at the hands of her most gracious Majesty the honour of Knighthood. Sir William Harrison Walker is one of the original members of the Marine Department of the Board of Trade, and there is no doubt that his great experience as a seaman, his sound judgment, and his business habits have been of the utmost assistance to that young and thriving department.

When the Mercantile Marine Act of 1850 became law, the then President of the Board of Trade appointed Mr. T. H. Farrer as Secretary, and Captain Walker and the late Admiral, then Captain, Beechey, R.N., as professional members. Mr. Williams was accountant, and Mr. Thomas Gray was subsequently appointed as a clerk. Captain Walker had been an officer in the East India Company's Service, and remained with them until the expiration of their Charter in 1833, when he became part owner of the *Madagascar*, *Agincourt*, and *Monarch*, some of the finest and largest ships trading to India. He did not lead an idle life, but commanded each of these ships in succession. Sir Frederick Arrow, the present Deputy Master of the Trinity House, succeeded Sir W. H. Walker in command of the *Monarch*. By the year 1847, Captain Walker had retired from the sea. On his entering into official life he at once took up the position he has maintained to this day, and on several occasions have his services been specially of value. He especially received the thanks of Lord Taunton when his Lordship retired on a change of ministry, and the professional skill and wide experience which he possesses, greatly contributed to the success of the scheme for the examination of masters and mates, and in the popularity as well as the success of the scheme for the Royal Naval Reserve.

Sir W. H. Walker was offered an appointment by Sir James Graham at the Admiralty on the formation of the Transport Department, but he declined, preferring to remain in the Board of Trade, where he was known and where his services, unostentatious and unobtrusive, were fully appreciated. As a public officer his experience has already been at the service of several administrations, and we are confident that we are echoing the sentiments of those officers who have had to do with him in his official capacity, when we express our hope that Sir William may long be spared to enjoy his honours, and to give to successive governments the benefit of his ripe experience.

ROYAL NATIONAL LIFEBOAT INSTITUTION.—On Thursday, the 2nd February, a meeting of this institution was held at its house, John Street, Adelphi—Mr. Thomas Chapman, F.R.S., V.P., in the chair. The silver medal of the institution and a copy of its vote inscribed on vellum were ordered to be presented to Mr. William Grant, coxswain of the Margate lifeboat *Quiver*, together with £8 18s. to himself and the crew of the boat, in testimony of their recent gallant services in saving from the rigging of the sunken brig *Sarah*, of Sunderland, the crew of six men. Rewards to the amount of £356 were also granted to the crews of other lifeboats for recent services. The *Robin Hood of Nottingham* lifeboat, at Boulmer, on the coast of Northumberland, rescued the crew of the wrecked schooner *Oxalis*, of Macduff; the Civil Service lifeboat at Wexford, Ireland, saved the crew of the barque *Paquita*, of Santander, and also saved two men from the smack *Lark*, of Wexford. The Ramsgate, Kingsdown, and North Deal Lifeboats have done good service to vessels in distress on the Goodwin Sands—the barque *Sea*, of Montrose, the American ship *Joseph Fish*, and the Italian brig *Sori*, being rescued from destruction and taken safely into harbour. The Cahore lifeboat saved five men from the schooner *Handy*, of Wexford; and the Wicklow lifeboat rendered valuable service to the barque *Mexican*, of St. John's, N.B., which was in distress off that coast. The Montrose lifeboat *Mincing Lane* took off three men from the galliot *Friendship*, of Goole, and five men from the distressed Danish schooner *Dania*. This valuable lifeboat not long since was also the means of saving twenty-four fishermen, whose boats had been overtaken by an unusually heavy sea. The Dungarvan lifeboat brought ashore the crew of the brigantine *Cornhill*, of Dungarvan. The Ramsey, Yarmouth, Winchelsea, and Bacton lifeboats were respectively the means of saving the crews from the wrecked brigantine *Lady Huntly*, of Maryport, the brig *Flora*, of Hull, the brig *Elizabeth and Cicely*, of Guernsey, and the stranded ship *Maria*, of Dunedin. These lifeboat services represent the saving of upwards of 100 persons from various shipwrecks during the storms of the past few weeks. £5 were also granted to the crew, numbering six men, of the Filey fishing yawl *Refuge*, for saving six men from the brig *Kirtons*, of Sunderland, wrecked on Filey Brigg. Various liberal contributions to the institution were announced as having been received.

THE Board of Trade have issued instructions to superintendents of Mercantile Marine Offices to take every opportunity of making masters, owners, and seamen acquainted with the fact, that small-

pox patients are not admitted into the *Dreadnought* Hospital Ship. In connection with this subject we extract the following from the *Pall Mall Gazette*, which certainly points to an unsatisfactory state of things. "On the 8th of last month a vessel called the *Star*, bound for London from West Hartlepool, put into Grimsby, and the captain landed a seaman suffering from small-pox. He was, however, ordered by the authorities (whoever they may be) to take the man on board again immediately, and was informed that this line of conduct subjected him to a severe penalty. Be that as it may, the wretched man was put on board again, and was of course compelled to inflict his disagreeable presence upon the rest of the crew in that most wretched of all ill-ventilated sleeping-places, a coasting ship's forecastle. The *Star* has probably by this time sown the seeds of the disease far and wide."

THE SUEZ CANAL.—We hear through various sources that a new company is about to be formed, for the purpose of taking over and working the Suez Canal. A statement has recently been published in the *Journal de Port Said* to the effect, that the receipts of the present company for the past year had amounted to £202,812, and that the working expenses of dredging and keeping the canal free, were about £12,000 a month, leaving a balance for the year of about £58,000, or but little more than one-half per cent. on the Capital and Debenture Stock, and that not including the £3,500,000 representing the sum invested by the Pacha of Egypt on which interest is not payable for nearly thirty years. This is not a cheering state of affairs, and on what terms a new company would take such a property, remains to be seen. No doubt the traffic returns will increase, but to any one acquainted with the canal as it is at present, it is evident that considerable improvement and enlargement will be necessary for any great increase, even if a large outlay may not in time be found requisite to keep the approaches at Port Said sufficiently deep for large ships. With such a deferred prospect, a new company would have to be prepared for a great extension of the capital account, and that in the face of a Debenture loan of four millions and other obligations of one and a quarter millions. As a mercantile transaction, the prospect is gloomy indeed, but we do not deem it hopeless when we consider its importance both commercially and politically to England. It would seem that of all nations Great Britain is clearly the most deeply interested in keeping the canal open, for when once our trade with the east by that route becomes established, and ships are designed and built for the purpose, a sudden closing of the

canal would cause a very considerable amount of inconvenience to us. The condition of the canal and its company at the present time is not satisfactory, and it is to be hoped it will be established on a better and sounder footing.

In 1863 a "floating anchor" consisting of the spare spars with the trawl beam and net of the trawler, or the square sail, was proposed by Rear-Admiral Bullock as a safe floating anchor by which a small vessel could ride out a gale of wind in safety, and we now hear that the Marine drag has been invented in the United States for the same purpose, and is said to answer extremely well. The success is so great that orders have been given for the construction of several, and the Revenue vessels of that country are to be supplied with them. We shall be glad to hear more of an invention which, if it at all answers to the description given, will prove a blessing to the thousands of fishing boats who take the open sea from our shores, the annual loss of which, with lives, is great.

Should England unfortunately ever be involved in another China war, she must be prepared for a very different style of thing to the wars she has hitherto had. John Chinaman has taken a lesson from the experience of his wars with Europeans, and although he may deem the latter barbarians and devils, he by no means disdains to take a leaf out of the devils' books, and has quite come to the conclusion that paper forts, hideous faces on shields, beating tom toms, and such rubbish are not the proper materials to withstand sixty-eight pounders, or a charge of the bayonet, and that if they be devils' implements, he must fight with devils' implements also, and likewise have some of the Satanic brethren to help to make them. In regard to Naval matters, we hear from our Consul at Foochow-foo that the Chinese Government arsenal for ship-building and the school of navigation and navy drill continue to thrive under the able directors and professors who have been engaged. In the year 1869 they turned out two steam gunboats. New works and engine-rooms on a vast scale were being built in a most substantial manner when the consul reported in 1870. It was intended to purchase a training ship for the pupils. The English and French languages are taught, besides geometry, naval drawing, and architecture. The whole establishment, however, was planned on too expensive a footing. Like true Chinese, who buy watches by the pair for fear one should not keep time, the authorities have provided themselves at this arsenal with a pair of directors, each at a salary of about £5,000 a year. It may be looked upon altogether

as a French institution, most of the Europeans employed, either as directors, assistants, professors, or foremen, being from France. We also hear from Tientsin that "when the governor of that place was embarking in November last for France, his guard, consisting of between four and five thousand men, marched in magnificent order," and our correspondent remarks, that "the Tartar cavalry are very fine men, some of the officers immense men of 6ft. 8in. to 6ft. 10in." Verily, we must "keep our house in order" if we are to fight with them again.

From an analysis by Mr. Henry Jeula of the wrecks and casualties reported at Lloyd's during the first half of the year 1870, compared with those of the same period of the previous four years, it appears that they were considerably below the average in the first four months, and much above the average in May and June; that casualties to steamers were greatly in excess of the average in each month except January, and that the instances of collision were greatly in excess of the average as regards steamers, and below it as regards sailing vessels, but that fewer lives were reported as lost, the diminution being 161 persons—equal to 19½ per cent. on the average total.

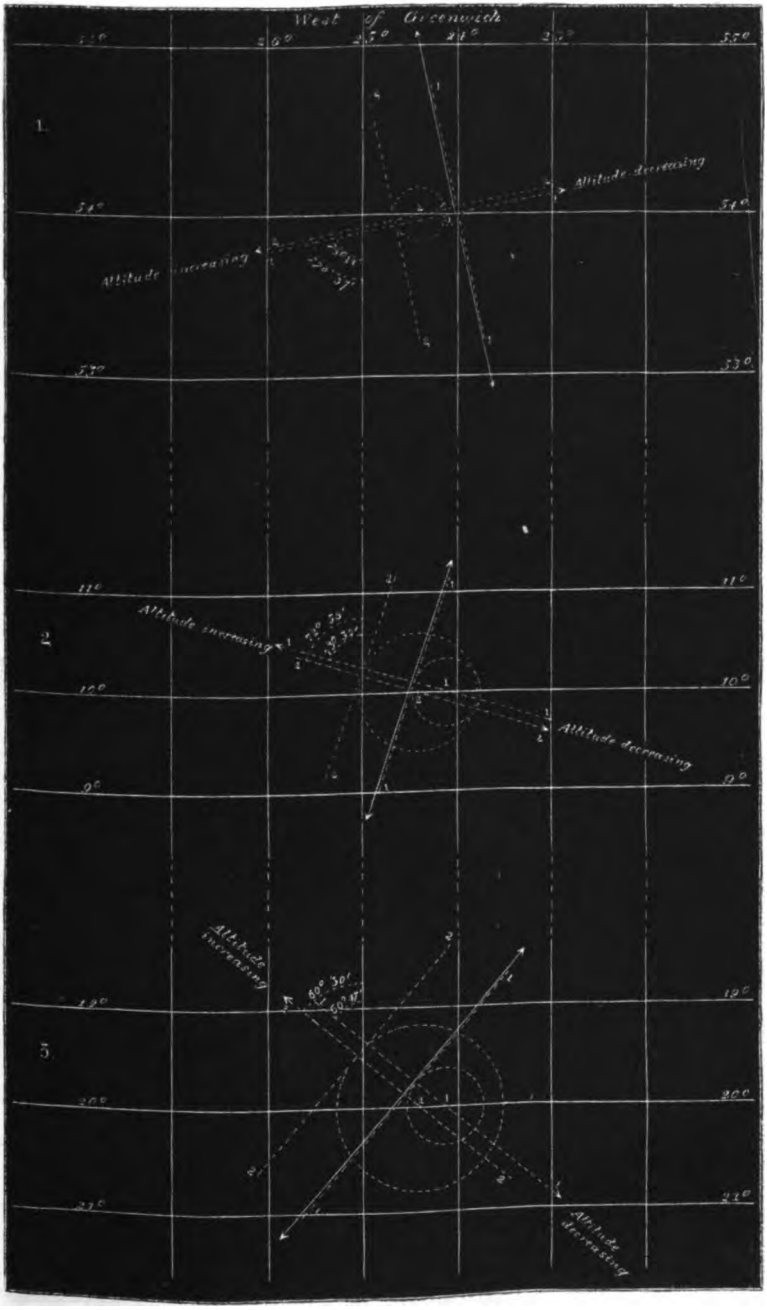
An iron screw steamship, the *Yorkshire*, designed and built by Messrs. Earle, of Hull, expressly for the East India trade viâ the Suez Canal, has just been launched on the Humber, and as she may be taken as the type of a class we give the particulars of her principal dimensions. The vessel is 330 feet in length at the load water line, 35 feet 2 inches in breadth, and 25 feet 6 inches in depth: her engines (also by Messrs. Earle) are compound and surface condensing, capable of being worked to sixty pounds pressure; length of stroke 36 inches. She is expected to average a speed of ten knots. She has accommodation for thirty-five first class and twenty second class passengers, and is fitted with every modern improvement.

This fine ship will shortly be in the Thames and we recommend those interested in ship-building to inspect her. Her owners are Mr. W. H. Tindall and Mr. Geo. Marshall, of London.

TO CORRESPONDENTS.

We have received the circulars of Dewrance and Co. and Mr. T. B. Johnston—but too late for notice in our present number.

We acknowledge Commander Dawson's attention in sending us the Merchant seaman's card, and hope to forward the good cause in our next.



THE

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ON THE DETERMINATION OF A SHIP'S PLACE FROM OBSERVATIONS OF ALTITUDE.

By Sir William Thomson.

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The ingenious and excellent idea of calculating the longitude from two different assumed latitudes with one altitude, marking off on a chart the points thus found, drawing a line through them, and concluding that the ship was somewhere on that line at the time of the observation, is due to Captain T. H. Sumner.* It is now well known to practical navigators. It is described in good books on navigation, as, for instance, Raper's (§§ 1009—1014). Were it not for the additional trouble of calculating a second triangle, this method ought to be universally used instead of the ordinary practice of calculating a single position, with the most probable latitude taken as if it were the true latitude. I believe, however, that even

* "A new and accurate method of finding a Ship's Position at Sea," by Capt. T. H. Sumner. Boston, 1843. "In 1843, Commander Sullivan, R.N., not having heard of this work, found the line of equal altitude on entering the River Plate; and identifying the ship's place on it in twelve fathoms by means of the chart, shaped his course up the river. The idea may thus have suggested itself to others; but the credit of having reduced it to a method and made it public belongs to Capt. Sumner." (Raper's Navigation, edition 1857.)

when in a channel, or off a coast trending north-east and south-west, or north-west and south-east, where Sumner's method is obviously of great practical value, some navigators do not take advantage of it; although no doubt the most skilful use it habitually in all circumstances in which it is advantageous. I learned it first in 1858, from Captain Moriarty, R.N., on board H.M.S. *Agamemnon*. He used it regularly in the Atlantic Telegraph expeditions of that year and of 1865 and 1866, not merely at the more critical times, but in connection with each day's sights. Instead of solving two triangles, as directed by Captain Sumner, the same result may be obviously obtained by finding a second angle (Z) of the one triangle (P Z S) ordinarily solved (P being the earth's pole, Z the ship's zenith, and S the sun or star). The angle ordinarily calculated is P, the hour-angle. By calculating Z, the sun's azimuth also, from the same triangle, the locus on which the ship must be is of course found by drawing on the chart, through the point which would be the ship's place were the assumed latitude exactly correct, a line inclined to the east and west at an angle equal to Z. But, as Captain Moriarty pointed out to me, the calculation of the second angle would involve about as much work as solving for P a second triangle with a slightly different latitude; and Capt. Sumner's own method has practical advantages in affording a check on the accuracy of the calculation by repetition with varied data.

A little experience at sea suggests that it would be very desirable to dispense with the morning and evening spherical triangles altogether, and to abolish calculation as far as possible in the ordinary day's work. When we consider the thousands of triangles daily calculated among all the ships at sea, we might be led for a moment to imagine that every one has been already solved, and that each new calculation is merely a repetition of one already made; but this would be a prodigious error; for nothing short of accuracy to the nearest minute in the use of the data would thoroughly suffice for practical purposes. Now, there are 5,400 minutes in 90°, and therefore there are $5{,}400^3$ or 157,464,000,000 triangles to be solved each for a single angle. This, at 1,000 fresh triangles per day, would occupy above 400,000 years. Even with an artifice such as that to be described below, for utilizing solutions of triangles with their sides integral numbers of degrees, the number to be solved (being 90^3 or 729,000) would be too great, and the tabulation of the solutions would be too complicated (on account of the trouble of entering for the three sides) to be convenient for practice; and Tables of this kind which have been actually cal-

culated and published (as, for instance, Lynn's Horary Tables*) have not come into general use.

It has occurred to me, however, that by dividing the problem into the solution of two right-angled triangles, it may be practically worked out so as to give the ship's place as accurately as it can be deduced from the observations, without any calculation at all, by aid of a table of the solution of the 8,100 right-angled spherical triangles of which the legs are integral numbers of degrees.

Let O be the point in which the arc of a great circle less than 90° through S, perpendicular to P Z, meets P Z or P Z produced.†

If the data were S P, P Z, and the hour-angle P, the solution of the right-angled triangle S P O would give P O and S O. Subtracting P Z from P O, we have Z O; and this, with S O in the triangle S Z O, gives the zenith distance, S Z, and the azimuth, S Z O, of the body observed.

Suppose, now, that the solution of the right-angled spherical triangle S P O for P O and S O to the nearest integral numbers of degrees could suffice. Further, suppose P Z to be the integral number of degrees closest to the estimated co-latitude, then Z O will be also an integral number of degrees. Thus the two right-angled spherical triangles S P O and S Z O have each arcs of integral numbers of degrees for legs. Now I find that the two steps which I have just indicated can be so managed as to give, with all attainable accuracy, the whole information deducible from them regarding the ship's place. Thus the necessity for calculating the solutions of spherical triangles in the ordinary day's work at sea is altogether done away with, provided a convenient table of the solutions of the 8,100 triangles is available. I have accordingly, with the co-operation of Mr. E. Roberts, of the "Nautical Almanac" Office, put the calculation in hand; and I hope soon to be able to publish a table of solutions of right-angled spherical triangles, showing co-hypotenuse‡ and one angle, to the nearest minute, for every pair of values of the legs from 0° to 90°. The rule to be presently given for using the tables will be readily understood when it is considered that the data for the two triangles are their co-hypotenuses, the difference between a leg of one and a leg of the

* Horary Tables for finding the time by inspection, etc., by Thomas Lynn, late Commander in the sea-service of the East India Company. London, 1827, 4to.

† Nautical readers will no doubt be able to make the small diagram for themselves.—Ed. *N.M.*

‡ It is more convenient that the complements of the hypotenuses should be shown than the hypotenuses, as the trouble of taking the complements of the declination and the observed altitude is so saved.

other, and the condition that the other leg is common to the two triangles. The table is arranged with all the ninety values for one leg (b) in a vertical column, at the head of which is written the value of the other leg (a). Although this value is really not wanted for the particular nautical problem in question, there are other applications of the table for which it may be useful. On the same level with the value of b, in the column corresponding to a, the table shows the value of the co-hypotenuse and of the angle A opposite to the leg a. I take first the case in which latitude and declination are of the same name, the latitude is greater than the declination, and the azimuth (reckoned from south or north, according as the sun crosses the meridian to the south or north of the zenith of the ship's place) is less than 90°. The hypotenuses, legs, and angles P and Z of the two right-angled triangles of the preceding diagram are each of them positive and less than 90°, and the two co-hypotenuses are the sun's declination and altitude respectively. We have then the following rule:—

(1.) Estimate the latitude to the nearest integral number of degrees by dead reckoning.

(2.) Look from one vertical column to another, until one is found in which co-hypotenuses approximately agreeing with the declination and altitude are found opposite to values of (b) which differ by the complement of the assumed latitude.

(3.) The exact values of the co-hypotenuse and the angle A corresponding to these values of b are to be taken as approximate declination, hour-angle, altitude, and azimuth.

(4.) Either in the same or in a contiguous vertical column find similarly another set of four approximate values, the two sets being such that one of the declinations is a little less and the other a little greater than the true declination.

(5.) On the assumed parallel of latitude mark off the points for which the actual hour-angles at the time of observation were exactly equal to the approximate hour-angles thus taken from the table. With these points as centres, and with radii equal (miles for minutes) to the differences of the approximate altitude from the observed altitude, describe circles. By aid of a parallel ruler and protractor,* draw tangents to these circles inclined to the parallel of latitude, at angles equal to the approximate azimuths taken from the table. These angles, if taken on the side of the parallel away from the sun, must be measured from the easterly direction,

* A circle divided to degrees, and having its centre at the centre of the chart, ought to be printed on every chart. This, rendering in all cases the use of a separate protractor unnecessary, would be useful for many purposes.

or the westerly direction, according as the observation was made before or after noon. The tangent must be taken on the side of the circle towards the sun, or from the sun, according as the observed altitude was greater or less than the approximate altitude taken from the tables in each case. The two tangents thus drawn will be found very nearly parallel. Draw a line dividing the space between them into parts proportional to the differences of the true declination, from the two approximate values taken from the tables. *The ship's place at the time of the observation was somewhere on the line thus found.*

To facilitate the execution of clause (2) of the rule, a narrow slip of card should be prepared with numbers 0 to 90 printed or written upon it at equal intervals, in a vertical column, equal to the intervals in the vertical column of the table, 0 being at the top and 90 at the bottom of the column as in the table. Place number 90 of the card abreast of a value of co-hypotenuse in the table approximately equal to the declination, and look for the other co-hypotenuse abreast of the number on the card equal to the assumed latitude. Shift the card from column to column according to this condition until the co-hypotenuse abreast of the number on the card equal to the assumed latitude is found to agree approximately enough with the observed altitude.

When the declination and latitude are of contrary names and the azimuth less than 90°, or when they are of the same names, but the declination greater than the latitude, the sum, instead of the difference, of the legs b of the two triangles will be equal to the complement of the assumed latitude; and clause (2) of the rule must be altered accordingly. The slip of card in this case cannot be used; but the following scarcely less easy process is to be practised. Put one point of a pair of compasses on a position in one of the vertical columns of the hypotenuse abreast of that point of the column of values of b corresponding to half the complement of the assumed latitude. This point will be on a level with one of the numbers, or midway between that of two consecutive numbers, according as the assumed latitude is even or odd; then use the compasses to indicate pairs of co-hypotenuses equi-distant in the vertical column from the fixed point of the compasses, and try from one column to another until co-hypotenuses approximately agreeing with the observed altitude and the correct declination are found. It is easy to modify the rule so as to suit cases in which the azimuth is an obtuse angle; but it is not worth while to do so at present, as such cases are rarely used in practice.

The following examples will sufficiently illustrate the method of using the Tables :—

(1) On 1870, May 16, afternoon, at 5h. 42m. Greenwich *apparent* time, the Sun's altitude was observed to be 32° 4′ ; to find the ship's place, the assumed latitude being 54° North.

The Nautical Almanac gives at 1870, May 16, 5h. 42m. Greenwich *apparent* time, the Sun's apparent declination N. 19° 10′. On looking at the annexed Table (which is a portion of the solutions of the 8,100 right-angled spherical triangles) under the heading $a = 56°$, and opposite $b = 54°$, the co-hypotenuse (representing the Sun's declination) is 19° 11′, and opposite $b = 18°$ (differing from 54° by the complement of the assumed latitude), the co-hypotenuse (representing the Sun's altitude) is 32° 8′, which are sufficiently near the actual values; we therefore select our sets of values from these columns as follows :—

			Co-hyp.	A.	
$a = 56°$	1.	$b = 54°$	19° 11′	61° 23′	= Sun's hour-angle.
		$b = 18$	32 8	78 14	= Sun's azimuth (S. towards W.).
	2.	$b = 55$	18 42	61 5	= Sun's hour-angle.
		$b = 19$	31 55	77 37	= Sun's azimuth (S. towards W.).

from which we have the following :—

Greenwich apparent time (in arc)		85° 30′.....	85° 30′
Sun's hour angle	(1)	61 23.....(2)	61 *5*
Diff. = Longitude		24 7 W.	24 25 W.
Sun's altitude (observed)		32° 4′.....	32° 4′
Sun's altitudes (auxiliary)	(1)	32 8.....(2)	31 *55*
Diff. =		— 4	+ 9
Sun's declination from N. A.		19° 10′.....	19° 10′
Sun's declinations (auxiliary)	(1)	19 11.....(2)	18 42
Diff. =		— 1	+ 28

This example is represented graphically in the first diagram annexed. The second set of values could have been selected equally

well from the contiguous columns ($a = 57°$), which on trial will be found to give an almost identical result.

Again, (2), on 1870, May 16, afternoon, at 5h. 42m. Greenwich *apparent* time, the Sun's altitude was observed to be 30° 30′; to find the ship's place, the assumed latitude being 10° North.

The Sun's declination from N. A. is N. 19° 10′, and the half complement of the assumed latitude 40°. By a few successive trials, $a = 56°$ will be found to contain values of co-hypotenuses approximately equal to the Sun's declination and altitude at the time, and which are equi-distant from 40°; we therefore select the following sets of values from this column as follows :—

			Co-hyp.	A.	
$a = 56°$	1.	$b = 54°$	19° 11′	61° 23′	= Sun's hour-angle.
		$b = 26$	30 10	73 32	= Sun's azimuth (N. towards W.).
	2.	$b = 55$	18 42	61 5	= Sun's hour-angle.
		$b = 27$	29 53	72 58	= Sun's azimuth (N. towards W.).

from which we have the following :—

Greenwich apparent time (in arc)		85° 30′.....	85° 30′
Sun's hour-angle	(1)	61 23.....(2)	61 5
Diff. = Longitude		24 7 W.	24 25 W.
Sun's altitude (observed)		30° 30′.....	30° 30′
Sun's altitudes (auxiliary)	(1)	30 10.....(2)	29 53
Diff. =		+ 20	+ 37
Sun's declination from N. A.		19° 10′.....	19° 10′
Sun's declinations (auxiliary)	(1)	19 11.....(2)	18 42
Diff. =		− 1	+ 28

In this case the sun passes the meridian to the north of the ship's zenith, the azimuth, from the Tables being less than 90°, is measured from the north towards the west. In this case also the second set of values might have been taken from $a = 57°$, which will be found on trial to give a position nearly identical with the above.

This example is represented in the second diagram annexed.

Again, (3), on 1870, May 16, afternoon, at 5h. 42m. Greenwich *apparent* time, the Sun's altitude was observed to be 18° 35′; to find the ship's place, the assumed latitude being 20° South.

The Sun's declination from N. A. is N. 19° 10′, and the half complement of the assumed latitude is 55°, to be used because the Sun's declination and the assumed latitude are of different names. Proceeding as in the previous example, we find the column $a = 56°$ again to contain values of co-hypotenuses approximately equal to the given values; and therefore have—

			Co-hyp.	A.	
$a = 56°$	1.	$b = 54°$	19° 11′	61° 23′	= Sun's hour-angle.
		$b = 56$	18 13	60 47	= Sun's azimuth (N. towards W.).
	2.	$b = 55$	18 42	61 5	= Sun's hour-angle.
		$b = 57$	17 44	60 30	= Sun's azimuth (N. towards W.).

which give

Greenwich apparent time (in arc)		85° 30′.....	85° 30′
Sun's hour-angle	(1)	61 23.....(2)	61 5
Diff. = Longitude		24 7 W.	24 25 W.
Sun's altitude (observed)		18° 35′.....	18° 35′
Sun's altitudes (auxiliary)	(1)	18 13.....(2)	17 44
Diff. =		+ 22	+ 51
Sun's declination from N. A.		19° 10′.....	19° 10′
Sun's declinations (auxiliary)	(1)	19 11.....(2)	18 42
Diff. =		− 1	+ 28

This example is represented in the third diagram annexed.

b.	a = 54°.		a = 55°.		a = 56°.		a = 57°.		a = 58°.		b.
	co-hyp.	A.	co-hyp.	A.	co-hyp.	A.	co-hyp.	A.	co-hyp.	A.	
°	° ′	° ′	°	°	° ′	°	° ′	°	° ′	°	°
1	36 0	89 16	35 0	89 18	34 0	89 20	33 0	89 21	32 0	89 23	1
2	35 59	88 33	34 59	88 36	33 59	88 39	32 59	88 42	31 59	88 45	2
3	35 57	87 49	34 57	87 54	33 57	87 59	32 57	88 3	31 57	88 8	3
4	35 54	87 6	34 54	87 12	33 54	87 18	32 55	87 24	31 55	87 30	4
5	35 50	86 23	34 51	86 30	33 51	86 38	32 52	86 46	31 52	86 53	5
6	35 46	85 39	34 47	85 49	33 47	85 58	32 48	86 7	31 48	86 16	6
7	35 41	84 56	34 42	85 7	33 42	85 18	32 43	85 29	31 44	85 39	7
8	35 36	84 14	34 37	84 26	33 37	84 38	32 38	84 50	31 39	85 2	8
9	35 29	83 31	34 30	83 45	33 32	83 59	32 33	84 12	31 34	84 25	9
10	35 22	82 49	34 24	83 4	33 25	83 19	32 26	83 34	31 27	83 48	10
11	35 14	82 6	34 16	82 23	33 18	82 40	32 19	82 56	31 21	83 12	11
12	35 6	81 25	34 8	81 43	33 10	82 1	32 11	82 19	31 13	82 36	12
13	34 56	80 43	33 59	81 3	33 1	81 22	32 3	81 41	31 5	82 0	13
14	34 46	80 2	33 49	80 23	32 52	80 44	31 54	81 4	30 57	81 24	14
15	34 36	79 21	33 39	79 44	32 42	80 6	31 44	80 28	30 47	80 49	15
16	34 24	78 41	33 28	79 5	32 31	79 28	31 34	79 51	30 37	80 14	16
17	34 12	78 0	33 16	78 26	32 20	78 51	31 23	79 15	30 27	79 39	17
18	33 59	77 21	33 4	77 47	32 8	78 14	31 12	78 39	30 16	79 4	18
19	33 46	76 42	32 51	77 9	31 55	77 37	31 0	78 4	30 4	78 30	19
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JAMES KENNEDY.

A Tale of the War Time.

By JAMES B. KENNEDY, Lieutenant, R.N.R.

In Eight Chapters.

Chapter I.

"Little pitchers have long ears," is a very old proverb for children listening and "taking in" the conversation of their elders; and I must acknowledge it is perfectly true as regards myself, for as a boy, when my father was a warrant officer in charge of the *Northumberland*, 74, also of the *Spartiate*, 74, then in ordinary, and his friends and shipmates visited him, and they took a glass of grog together, my brothers and myself used to sit and listen to the tales and anecdotes they used to tell each other with undiminished pleasure. As my father was of a social disposition — although by no means an intemperate man—his society was, in his station in life, much sought after, so that our opportunity of hearing him repeat his adventures were frequent and were never forgotten. When my father died, his journals and other papers came into my possession, and, as a master of a ship, having much time at my disposal, I made a fair transcript of the journals. In doing so, the incidents I had so often heard from my father's lips were brought so vividly before me that I marked them as I went on, with the intention of referring to them again. On the completion of my copy, I thought I would try and embody the interesting episodes of my father's life, with no other view at the time than my own amusement. I experienced some difficulty in connecting the details, such as how he got from one ship to another, as will be apparent in reading the narrative. There also may, possibly, be little discrepancies, which from my father's position are likely to occur, but as it was written with no intention of publication, I trust these may be overlooked.

Of the birth or parentage of my father I do not know anything, save that he was born in 1774. His mother was living at Pollock Shaws, near Glasgow, with a large family about the year 1784, when James (my father), her second son, went to sea, in a sloop trading to the Islands and Highlands on the West Coast of Scotland, from the River Clyde.

In 1788 and 1789 he was in the *Savage* sloop of war, but I

think he deserted from her, upon occasion of being sent on shore, with the stewards, to purchase fresh stock, etc., when the boat's crew got drunk and pelted the stewards and the midshipman with eggs. My father's local knowledge was the reason of his being sent into the boat, and it enabled him to escape.

He next served in the *Stately*, 64, and was in her on the Newfoundland Station.

The old *Impregnable* was his next ship, which he joined on the breaking out of the war in 1792, and he served in her under Rear-Admiral Benjamin Caldwell in the action of 1st June.

On the 2nd May, 1794, the fleet of twenty-five sail of the line and fifteen frigates under Lord Howe, left Spithead, having a large convoy of ships bound to the East and West Indies, to get clear of the channel. After seeing them well on their voyage, and out of danger of capture by the French, the fleet went off Ushant and ascertained that the French fleet was at anchor in Brest roads, but soon after the French got away. My father describes the excitement among the men on board the *Impregnable* as being very great, some of them looked upon the French fleet as their property already, and would have speculated in their prize money on no very easy terms if there had been any one to have bargained with them for it, and when a ship joined or rejoined the fleet they almost looked upon her as an interloper, come to do them out of a part of their legitimate rights.

They found out afterwards that the fleet got away on the 16th, three days before Lord Howe returned to Ushant, and finding them gone, they went to look for them, and a few days after they recaptured some English vessels that had been captured by the French fleet; it went to their hearts to see prizes in a blaze, for the ships were not too well manned to spare any to be sent in prizes. My father says, that a whisper went round that although the prizes were lost, they had obtained information from the prisoners taken that was of more value, and my father overheard one of the officers say to another, "Engage us at close quarters, will they! that's the best news we have ever heard; and as to their hot shot, we'll give it to them hot enough, if they will only let us get near them."

On the 28th, they at last sighted the grand French fleet, and a partial engagement took place; they did not seem anxious to engage us, for Lord Howe had to make the signal to chase. My father said, it was a fine sight to see the old "Billy-roughen" *(Bellerophon)* attack the French three-decker. Again, on the 29th, there was more fighting, but my father's ship was not engaged.

On the morning of the 1st June, they at last had the French fleet to leeward—the only position in which they could attack them, as the French ships sailed better on a wind than the English. After breakfast they cleared for action, and bore down on the enemy, and a glorious sight my father described it to be; he had a good view of both fleets, for being a young man and active aloft, he was stationed in the foretop to keep the flag flying during the action. About half-past nine the French opened fire, and the action soon became general.

The signal halliards were shot away five times, and twice they unrove, so that my father had to go to the mast-head twice to reeve them. During the action, several hammocks were lashed across the lanyards of the topmast rigging to protect the topmen from shot. My father felt a desire to see how they were getting on on board the French ship with which they were engaged, so he went down the forelift on to the lee yard-arm to have a look, and saw at intervals through the smoke the deck littered with dead and wounded, and as he described it, "like a shambles." While out on the yard-arm, he was astonished by a heavy fire being opened on their ship from to windward, and a shot came through the foretopsail close to him; so he went back into the top as fast as he could, and saw a French line-of-battle ship,* with all masts gone, and only a flagstaff standing, firing at them. The fleet had drifted faster to leeward than she did. While looking at her, an English ship that was running along the line, repeating signals, rounded to under her stern, and fired two broadsides into her, and then kept away again. He told me that he saw the shot come out through the bows, and that she commenced to settle down in the water, and shortly after sank; and that she continued to fire her upper deck guns until they were nearly level with the water, and that the French flag flying on the staff was the last thing he saw of her.

Once when the signal halliards were shot away, one end flew out on to the foreyard, and a master's mate, who had been sent up there for something, passed it into the foretop to my father. The *Impregnable* had seven men killed and twenty-four wounded; among the former was the master, a fine old man, and among the latter the boatswain and a lieutenant. Although much exposed and often fired at as he went aloft to reeve the signal halliards, my father escaped unhurt. All hands were now kept at work, repairing

* The *Vengeur*, after being locked with the *Brunswick* fighting three hours, separated from her, and was then fired into by the *Ramilies*. With her fore and main masts gone, and part of her mizen mast, on the stump of which she had re-hoisted her colours, she went down.

damages, transferring prisoners, and rigging jury masts; this took four days to accomplish, and then they made sail for England.

When the ship arrived at Portsmouth, my father was one of the barge's crew, who pulled the admiral and his brother (a military officer) on shore. The admiral's brother gave them two guineas (I think that my father was the coxswain) to get a drink with: they left two hands in charge of the boat, and all the rest went to a public house. After having their drink they went down to where they had left the boat but could not find her. Some time after they heard that she had been picked up in Porchester Lake above the dockyard, full of water, and oars, sails, and everything gone out of her. Thinking that if they returned to the ship they would be flogged, they all agreed to go to a celebrated Jew crimp in Portsmouth, who stowed them away for a few days, and then smuggled the whole thirteen of them on board the Indiaman *General Kydd*, one of the India fleet then at anchor at the Mother bank, waiting for hands. This fleet took out the military force under General Clarke that captured the Cape of Good Hope in 1795. My father was one of the volunteers from the Indiaman who served on shore with troops, and with others did the duty of artillery horses, in other words, dragged the cannon. My father did not think much of the fighting, and said very little about the capture of Cape Town, but declared that dragging guns through the deep sand was much harder work than fighting, and that they suffered much from want of water.

In the *General Kydd* my father was quartermaster and captain's coxswain; there were many deserters from ships of war, besides the thirteen from the *Impregnable*, and they made up their minds that they would not be flogged; this difficulty was arranged on board the *General Kydd*.

When the fleet arrived in China, a sailor was to be "punished through the fleet," and he was brought alongside the *General Kydd* (as the junior ship, I believe) to receive his first modicum. When everything was prepared for the punishment, a sudden rush was made by the *General Kydd's* crew into the launch, the triangles and cats pitched overboard, and the man who was to be flogged handed on board the ship; this caused a row, but the ship's company remained firm in their determination, neither to allow the man to be flogged alongside their own ship, nor to give him up to be flogged any where else. The *General Kydd* was then ordered down the river away from the fleet, so that her crew's mutinous conduct might not contaminate the other ships.

The captain's boat had to attend on board the commodore's ship

every day, and also to take the captain to Whampoa when he wished to go there. Upon the occasion of one of those visits to Whampoa, the coxswain and boat's crew went to refresh themselves in Hog Lane, which at that time was protected by gates on the river side. While refreshing themselves they succeeded in getting into a row, and a fight with the Chinamen, and had to retreat: my father brought up the rear armed with a boat's stretcher, and they went on very well until they came to the gate, which the Chinamen had half closed, and were struggling to get closed entirely, while the boat's crew on the other side were striving to keep it open, as my father turned to make a bolt out of the gate the Chinamen caught hold of his tye (pig tail), his shipmates caught hold of his arms, and as they were hauling different ways he was nearly strangled, when one of the boat's crew, with great presence of mind, out knife and cut his pig tail off, leaving it in the possession of the Chinese, who exulted over it very much.* My father never wore a pig tail after this, and was in consequence a very odd looking man-of-war's-man then.

Chapter II.

When the India fleet returned to England, they anchored at the Mother bank, and boats from the ships of war were instantly alongside to press: my father, and one of the old *Impregnables*, succeeded in getting into the pilot boat through one of the lower deck ports, as she was dropping astern with the chief mate in her, who was going on shore: they got into Portsmouth harbour all right, and the chief mate told them to lay quiet, and he would try and assist them in getting to London: some hours after, a man came from one of the Jew crimps and told them that the chief mate had spoken to his master, and that it was all right, and that after dark he would come for them: about nine p.m. Barnet, the Jew, himself came for them, and took them on shore and home to his house. They lived there a few days, while some clothes were being made for them, and while there, assigned over to the Jew all their pay and prize money due to them, for the taking of the Cape of Good

* As a Chinaman is considered to be a disgraced man if he lose his tail, and the greatest possible insult that can be offered to one is to seize him by that appendage, no doubt they thought that an Englishman would place the same importance on his, hence their exultation, and probably it was greater than if they had killed him.

Hope, the Jew giving them an order on some person in London for an amount equal to six months' pay.

When the new clothes arrived, my father was dressed in a blue frock coat, black silk waistcoat, tight-fitting pantaloons, and hessian boots worn outside, with powdered hair and frilled shirt; his shipmate was dressed like a master butcher, with corduroy breeches, white top boots, and a large white overcoat; in this *rig* they both set out one evening for the London coach office, their friend Mr. Barnet, the Jew, walking between them, the three locked arm in arm. Shortly after leaving Mr. Barnet's house, they met a friend of his, who enquired if it was all right, and being informed by him that it was, they passed on towards the coach office: in a narrow street they met five men, who came up in front of them, and one, tapping my father on the shoulder, told him that he arrested him in the name of the King. "On what charge?" said my father. "On that of having concealed contraband goods on your person." "There must be some mistake," said the two gentlemen. "No mistake at all," said the five men, "you must come before a magistrate." "It's the easiest way," said Mr. Barnet; so away they went to the Portsmouth gaol, I think it was then called the Red-house. Mr. Barnet went with them to the door, but did not follow them inside: the charge of smuggling having been stated, they were searched, and as they did not have any contraband goods about them, the gentleman in the hessian boots expressed himself in very indignant terms to the superintendent, and informed him, that if, through the stupidity of him and his underlings, he lost the coach to London, that he should at once order a post-chaise and proceed; and enter an action against him for his detention, and he further requested him to have them both shewn out at once.

"Don't you be quite so fast, young man," cried the official; "you think that you are very clever, but you have been sold like a couple of bullocks in Smithfield. Your name is James Kennedy, and yours is William Smith, you are both deserters from H.M.S. *Impregnable*, and you have just landed from the *General Kydd*, East Indiaman. Barnet the Jew has the assignment of both your wages and prize money that may become due to you for the taking of the Cape; and I have paid him ten pounds apiece for the information he gave us, that enabled us to catch you, and to-morrow morning you will be sent on board the *Magnificent*, 74." "Well," says my father, "that we are caught is pretty certain, but as pressed men, we have the privilege of volunteering into any ship we like, and we won't go into the *Magnificent*, 74." "We will see about that in the morning," said the official. He further kindly

informed them, that there was a debtors' part of the prison, and that if they had money to pay for supper and lodgings, there were people who would be glad of their company.

As they had money, they were shown into a room in which about a dozen people were just sitting down to a hot supper. They were welcomed by those gentlemen, and invited to sit down; my father sat down alongside a gentleman in a naval uniform, who turned out to be the purser of the *Diamond* frigate, Captain Peyton, that ship being in the drydock at the time. He told his story to the purser, who said, D—— it, if you must *serve*, come and serve with us; I will make it all right with Captain Peyton. Upon this, both of them agreed to volunteer for the frigate, and the purser sent a note to Captain Peyton to inform him of it.

Next morning, the superintendent of the prison sent for them to go on board the line-of-battle ship, a boat having come from her to take them off. But they managed to get into the felons' department, among the criminal prisoners, and giving half-a-crown apiece to them, told their story. The prisoners at once took their part, and swore that they would tear any one in pieces who tried to take them away.

While this was going on, the purser sent another note to Captain Peyton, informing him, that the keeper of the Red-house was forcing two of his men to go on board the *Magnificent*. This note brought Captain Peyton himself down, just as the master, with the line-of-battle ship's boat's crew, and a lot of warders, were going to drag the two men out from among the prisoners. The captain at once laid into the gaoler with his stick, and took the two men away with him, and put them on board the *Royal William*, at Spithead, for safe keeping, until the frigate came out of dock.

When they joined the "Royal Billy" she had eighteen hundred men on board of her, and was, probably, the most horrible place except Pandemonium* in the universe; and to fancy a couple of men put on board of her in the costume described, some idea can be formed of their position, but my father and his shipmate were stout fellows, and having thrashed one or two of the bullies, they had a quiet life.

Captain Peyton interested himself in their behalf, and tried to stop the money being paid to Barnet the Jew, but he was too late, the Jew received it. However, they had managed during the voyage in the Indiaman to pick up a good chest of clothes, and Captain Peyton succeeded in sending to Portsmouth for

* The latitude and longitude of this spot *in the universe* is not given by the Author.—ED.

them; so that at the end of a week they were able to put away the hessian boots and dress themselves as sailors once more. The *Diamond* frigate shortly after came out of dock, and my father became captain's coxswain.

I do not know how long he remained in the *Diamond*, but I think he volunteered into another ship, upon occasion of being berthed on board the *Royal William*, while the *Diamond* was again in dock, after being on shore on the Coast of France.

(To be Continued.)

MERCHANT SHIPPING LEGISLATION.—IV.

INQUIRIES INTO WRECKS AND MISCONDUCT AT SEA.

"It is not the practice with destroyers of vermin to allow the little victims a veto upon the weapons used against them. If this were otherwise, we should have one set of vermin banishing small-tooth combs; another protesting against mouse-traps; a third prohibiting the finger and thumb; a fourth exclaiming against the intolerable infamy of using soap and water. It is impossible, however, to listen to such pleas. They must all be caught, killed, and cracked, in the manner and by the instruments which are found most efficacious to their destruction; and the more they cry out, the greater plainly is the skill used against them."

Rev. Sydney Smith, "Edinburgh Review," 1808.

The running of mankind to and fro on the face of the earth, and the consequent increase in knowledge and riches, are, if not mainly, at all events to a very great extent, due to the mercantile navies of the world; and pre-eminent amongst those navies stands the mercantile navy, or—as we now always call it—the mercantile marine of Great Britain. This pre-eminence is due in a great measure to the causes referred to in our former article; but working with those causes are others as great and as certain in their effects; causes which no statutes can affect, and no excess of prosperity on the one hand, or of adversity on the other hand, can interfere with, viz., energy and honesty. To impeach the honesty of the British shipowner, would be as great an act of folly as to question his energy. The happy combination of these two qualities has placed him at the head of all civilizers. But the pre-eminence of this great body for integrity has, unfortunately, often served as a cloak under which the dishonest have worked out many evil de-

signs. A scoundrel obtaining admittance amongst a respectable body will, under the protection afforded by the fair name of the whole body, necessarily have endless opportunities of practising his scoundrelisms; and the more his professions and outward behaviour accord with the professions and outward behaviour of the general body, the less will he be suspected and the more likely will he be to escape detection.

The commonest illustration of this is to be found in cases where a pre-eminent rascal is also pre-eminent as a professing Churchman. He may obtain many social and other temporal advantages by his connection with a Church, and he may never be detected; but his presence in the flock is no element of strength to them, and his personal evil-doings are no evidence of evil in the other members of the flock. When the impostor is detected, the general body of the community to which he belongs not only does not suffer, but is actually benefited by his removal. The truths professed, the fundamental principles holding the members together, are vindicated and remain unimpeachable, and the society is altogether comforted and strengthened by the purging; it moreover, escapes the danger arising from contamination. This is true as regards black sheep in all other bodies and communities. We are about to bring forward in a part of our remarks some curious modern instances of dishonesty on the part of shipowners and shipmasters, but we do not bring these cases forward with a view to charging shipowners as a class with dishonesty, nor with the view to proving that they require special looking after in the way of State inspection and Government interference. On the contrary, we intend to refer to these modern instances with the special object of showing that no State inspection can possibly affect them. If a scoundrel is anything but an out and out fool, his first care when he wants to commit a fraud on underwriters, will be to comply in every possible way with statutory regulations as to surveys, inspections, and classifications. The honest and general body of respectable shipowners comply with all statutory requirements with honesty of purpose and singleness of heart, out of regard for the general good; the rogue will comply with them with a view to removing suspicion, but not even with this view alone, for he will have the further object of obtaining the evidence of the whole staff of Government officials in his favour in the event of suspicion afterwards arising. The more rigid the forms, the more strict the survey, the more minute and maternal the interference, the more will he like it. What such a scoundrel would object to is, not surveys and inspections, but inquiry. His fervent

prayer would be that, whilst he might have to comply with endless forms and ceremonies and inspections and other outward manifestations, he might be preserved from subsequent investigation. A fairly good ship, a decent crew, good wages, good insurance, an "eccentric" master or mate, and a prompt settlement, but no inquiry. Inquiry is the instrument "efficacious to his destruction," and is in fact to the rogue in such a case exactly what the Rev. Sidney Smith's "small-tooth comb" is to the set of vermin who would "banish" it.

To proceed then with the matter in hand—

1. A ship may be lost without any act of omission or commission on the part of her owner or master—

(*a*) By the act of God—*i.e.*, perils of the sea, of the elements, etc.

(*b*) By the hands of the Queen's enemies.

(*c*) By wreckers, pirates, and others outside the ship compassing her loss.

(*d*) By collision with another ship.

(*e*) By error of judgment.

(*f*) By the bursting of boilers, the breaking down of machinery, and other circumstances arising within the ship.

(*g*) By the unavoidable removal of buoys, beacons, etc.

2. A ship may be lost by an act of omission or commission on the part of the owner or master—

(*a*) By direct and wilful casting away.

(*b*) By inattention to necessary repairs.

(*c*) By not providing proper apparel and equipments, or officers and crew.

(*d*) By overloading, or improper loading or stowage.

(*e*) By employing her in a trade for which she is unfit.

3. It is not to the interest of the shipowner to keep his ship afloat if she does not pay, or if by her loss he will be paid better than by employing her in trade.

4. If a ship is to be lost, it can generally be so arranged that her loss or abandonment shall be brought about in such a manner as to evade detection of fraud and escape punishment.

5. Ships lost are generally replaced by a better class of ship, nevertheless shipwrecks are a positive evil, inasmuch as that they are attended with loss of life, and with waste of valuable material and labour.

A reference to the Board of Trade Wreck Register results in the important revelation that in ten years 16,882 wrecks and other casualties happened to ships on and near the coasts of the United Kingdom. The annual average for the last five years (1869) is

1893¾. The number of lives lost on our coasts in ten years is 8056. The number lost last year was 662. In addition to the disasters and loss of life happening to ships on and near our coasts, we have to bear in mind casualties and losses abroad and on the high seas.

If we turn to the records of Insurance we shall find that in the last five years 9999 sailing ships and 589 steamers have been entered in the lists as totally lost, in addition to 1093 ships and thirty-seven steamers constructively lost. This record refers to losses over the whole world of ships chiefly insured in the United Kingdom.

In addition to the losses on our coasts, of which the numbers are given above but included in the 9999 and 589, there are 846 ships and crews whose end is utterly unknown, 149 steamers out of the whole number of steamers lost, having been lost on voyages to and from ports on the east coast of Great Britain. All we know of the 846 "missing" ships is, that they left their last ports of departure, and that they have never since been heard of. All the owners know of them is, that if they were insured, the sum for which they were insured has been duly received. All the underwriters know is, that the ships were almost wholly underwritten as "staunch, tight, strong, and well found," and as "good ships," and that the insurance has been promptly settled. The ships are posted up as missing—the crews are missing, but are not posted up—the crews, the passengers, the widows and orphans left—but we must not enter into speculations. To treat this matter in the manner commonly known as "feeling" would be to travel altogether away from the object of the present paper. It is not our present intention to enlarge upon shipwrecks from a sentimental point of view, nor to "improve the occasion" by introducing a sermon. On the contrary, we are about to proceed altogether in cold blood, and in the most hard-hearted business-like manner possible. To accomplish the object we have in view, we must speak of the loss of a ship with no more apparent concern than of the loss of a tea-spoon. It is better for a surgeon to sew up a gash effectually and coolly, and without any display of feeling, rather than to enlarge and weep upon the enormities of vices in general, and of combative drunkenness in particular, while the wound remains unattended. There are plenty of people who can write sentimentally about shipwrecks and preach and weep (*teste* Mr. Plimsoll at Manchester). Let them indulge by all means; but although we shall be willing to appreciate the views of the sentimentalists and preachers and weepers, at some fitting opportunity, for the present we must treat

dry facts in a dry and clear manner. Such is the sentiment attaching to ships and sailors and perils of the sea, that but few people are to be found who write and talk about them as reasonably as about anything else. Wrecks and casualties looked on in a matter-of-fact light and treated in a business manner will at least possess the claim of novelty. Our only regret is, that owing to want of time and want of space, we cannot treat the subject so completely as we could wish. As regards time we can only write these articles in moments snatched from rest after a heavy day's work; and as regards space, the *Nautical Magazine* would have little room for more entertaining matter if we were to trespass beyond our present bounds. We hope that some one with more leisure and better opportunities will at some future time take up the whole subject of marine disasters, and investigate it as fully and minutely as its importance deserves.

We shall now take a glance at wrecks both wilful and accidental, and consider how far they are likely to be affected by Inquiries, Surveys, Certificates, and Insurance.

Accidental Wrecks, Strandings, etc.

We begin with those marine disasters in which there can be no allegation that the loss arises from acts of omission or commission on the part of the owner, master, or crew; and the question for consideration is whether preliminary inspection can prevent such losses; and if not whether they should be followed by inquiry. If there is no allegation of fraud or inadvertence on the part of the owner or his servants, the question that naturally suggests itself is, why there should be inquiry? The answer is obvious. Let us take the case of the *London*. This is a case in which no suspicion of any improper act ever has existed or ever will exist. The ship was as fine a ship of her class and as strong a ship as ever went to sea; the owners, men of known respectability. There is no allegation of unseaworthiness and no suspicion of foul play. If any thing has ever been placed beyond a doubt it is the fact that the owners acted honestly and in *bonâ fides;* and, moreover, in the opinion of every official who had to do with her the *London* was seaworthy and fit for her voyage, and yet she foundered. The same may be said of the *City of Boston*, and yet she disappeared. Here we have two ships eminent for their soundness and fitness for the voyage. Both had been surveyed by Government surveyors over and over again, and by other surveyors besides; both belonged to owners whose respectability and honesty are beyond question; both had been declared to and certified, and both were lost with

an immense sacrifice of life. The surveying and inspecting by Government officers did not prevent these losses for the reason that they were owing to circumstances altogether beyond anything that can be met or prevented by Government inspecting and surveying. But because these losses were not and could not have been prevented by Government surveys, that is no reason why there should not be inquiry (an inquest) afterwards. In the case of the *City of Boston* there was a full and searching inquiry ("Inman *v.* Jenkins") at which we were present, and it was then established to demonstration that the ship was in perfect order when she left port, that she was underladen rather than overladen, and that she ought to have made the voyage in safety. In the case of the *London* there was also an inquiry, with a similar result. But the immediate effect of the *London* inquiry was to set everyone thinking about improved coverings for hatchways, and ever since then improvement has been steadily going on in that direction. We could, had we space, give a score of cases in which a surveyed and certified ship has been stranded, or wrecked, or has foundered, or has met with a casualty to her machinery, utterly beyond and beside anything that could be met by surveys and certificates, and entirely without any fault whatever on the part of her owners, in which subsequent inquiry has been the means of bringing about some important improvement, or of effecting good directly or indirectly. For instance, inquiry has led to the establishment of lifeboats or rocket apparatus, to the use of lifebelts, to the establishment of a lighthouse or light-vessel, to the correcting of charts and sailing directions, to the alteration in the character of a light, and to improved arrangements in steamships as regards valves, pumps, etc.; to the prosecution of wreckers, to the removal of coastguard-men, to the removal of obstructions to navigation, etc., etc. All emigrant ships and all passenger ships are surveyed, inspected, etc.; and all their officers have certificates, and notwithstanding this surveying, and certificating, and inspecting, losses happen. The following cases prove this:—*Royal Charter*, 446 lives; *Cambria*, 180 lives; *City of Boston*, 191 lives; *London*, 233 lives; *Pomona*, 424 lives; *Amazon*, 100 lives; *Annie Jane*, 360 lives. Seven ships, with a total of 1,934 lives. All surveyed, all certificated, and all lost. On what grounds then can it be urged that certificating and surveying will materially lessen loss of life? Why did it not prevent the losses we have named? Simply because these large losses arise from circumstances altogether above and beyond anything that can be affected by certificates and surveys.

Casting Away.

This part of our subject is decidedly unpleasant, but its unpleasantness must not hinder us from looking into it. We have often in discussions met with good and able men who profess not to believe that a shipowner can be found in Great Britain who would wilfully cast away a ship. The possession of such a belief always bespeaks a manly heart, a just appreciation of right and wrong, a fine sense of moral duty; but inasmuch as such a belief is utterly opposed to fact, no one holding it can grapple with the present subject. Many of our readers judging other men by their own honest selves will at once say that if we intend to assert that there are shipowners in this country, in the reign of Victoria, with a free Church, free education, and almost manhood suffrage, a liberal Government, and heaven knows what blessings and advantages besides, who will deliberately and intentionally send a ship to sea to be lost, we shall utter a monstrous libel on the British shipowner. We can only proceed to proofs. "'Tis true, 'tis pity; pity 'tis, 'tis true." In the early part of this paper we have stated honestly our opinion of the character of British shipowners as a class; we must now refer to the social vermin that exist in that class. It is not with a view to leading the reader to form a bad opinion of his fellow-man that we are compelled to be plain at this point. Nor is it with a view to shewing that extra special precautionary legislation is needed. Our object here as before is precisely the reverse, viz., to shew that surveys will not meet these cases, and that the present law with a little care or system on the part of underwriters is sufficient. Our statement is that ships are sometimes deliberately sent to sea to be lost; and that in such cases when the loss is well managed, the profits to the parties implicated are large and quite sufficient to compensate them for the risk incurred. The case of the *Severn* may be given as an illustration.

The following statement is abridged from the opening speech of Sir Richard Karslake, Solicitor General.

The prisoners, Charles William Lee Webb, aged 29, sailor; Thomas Berwick, aged 42, sailor; Lionel Holdsworth, aged 41, broker; and Joseph Stansfeld Dean, aged 42, agent, stood indicted. * * *

Substantially the charge resolved itself into this:—

That the prisoners Holdsworth and Berwick, being interested in a vessel called the *Severn*, with the assistance of Dean, who sometimes appears as a partner of Holdsworth, sometimes as a clerk at Holdsworth's, and sometimes as a firm carrying on business in the name of Allsopp and Co., assisted and aided in procuring the prisoner Webb to cast away this vessel at the time she

was on the high seas, for the purpose of defrauding certain insurance companies to an enormous extent, and reckless of the peril to the lives of the crew that might be entailed by this most wicked act. The four prisoners, WEBB, BERWICK, HOLDSWORTH, and DEAN began to be associated together in this particular transaction early in the year 1866. Berwick was a master mariner, who resided near Liverpool, and in the year 1865 he was the owner of a vessel called the *Jane Brown*. Of that vessel, Webb was the carpenter in the last voyage she ever made. That vessel was lost at sea. The prisoner Holdsworth was, or professed to be, a ship insurance broker. He was intimately connected with Berwick. Dean was also at one time a Liverpool man. During the transactions which led to the purchase of the *Severn*, Dean acted as clerk apparently, although sometimes he said he was the partner of Holdsworth. At other times, later in the year, he appears to have acted as Allsopp and Co. * * * * In the beginning of that year (1866) Holdsworth interested himself in looking out for a vessel which would suit the purposes that the parties had in view. * * * * *

The object of the prisoners Holdsworth and Berwick was, beyond all doubt, to get the ship into their possession without having to find cash to pay for her. * * * *

The result was that for no cash payment at all the *Severn* found her way, nominally, into the hands of A. B., and actually, into the hands of Holdsworth and Berwick. That transaction having been completed, the vessel which is represented by Holdsworth in a letter to be in perfectly good order and condition, was to be sent round to Newport for the purpose of being loaded with coals. A question arose as to who should be the officers of the ship. Berwick said that the mate of the vessel was to be Webb, the prisoner, who had been the carpenter on board a vessel the *Jane Brown*, in which Berwick was unquestionably interested, and in which Holdsworth appears to have been interested also. This vessel was lost at sea, and with regard to her Webb made a statement that he had himself sunk the vessel by boring holes in her, as he afterwards did in the *Severn*. Webb was the person selected to be the mate. Holdsworth was to select a captain, and he chose a man under whom Webb was to serve as mate, a man who had been commander of a vessel called the *Thomas*, which, as a matter of fact, also foundered at sea. Berwick and Holdsworth represented Webb as an eccentric sort of man, from whom the master had better keep to some extent aloof, and not watch too narrowly his eccentricities. There were other conversations coming nearer and nearer the point to be achieved; and eventually the master was told that the *Severn* would never reach Shanghae. Then Berwick and Holdsworth getting bolder, the master was told that he was to connive at the act of Webb in casting the vessel away, and that what was in contemplation would put £700 in his pocket. Webb was found to be, as he had been described, somewhat eccentric; but the master was told by Holdsworth that he must put up with him as well as he could. The *Severn* was coppered higher than was usual; and she was tight and staunch in every respect. * * * * *

Insurances amounted to some fourteen or fifteen thousand pounds, the freight alone being insured for a sum of £3,300. But not content with their insuring the vessel above its value, the Captain was offered £10 by another party if he would allow certain packages to be carried into his cabin; and he agreed to do so for that sum. He did take them into his cabin, and the £10 was actually paid to him. Upon these cases, said to contain arms, an insurance for £1,500 was

effected. The arms were said to consist of carbines, revolvers, and swords. But what were the actual contents of these cases which had been insured for £1,500? These packages actually contained nothing but about £4 worth of salt.

After the trial, Inspector COZENS stepped into the witness-box and handed a document to Mr. Justice BLACKBURN.

His Lordship said: I see that this is a warrant for the apprehension of Berwick, granted by the Liverpool magistrates, and charging him with scuttling the *Kate Kearney*. It has not been executed, has it?

Inspector COZENS: No, my Lord; the Captain went abroad for some considerable time, and the warrant could not be executed in consequence of his absence.

Mr. LEWIS: There is also, my Lord, a list of ships belonging to Berwick and Holdsworth, which I will hand up to you.

Extract from the list, referred to by Mr. Lewis, of ships belonging to Berwick and Holdsworth:—

Vessel's Name.	Tons.	Owners, etc.	Date of Loss.
Uncle Donald	267	Thomas Berwick, Sen.	Lost, 1844.
Samuels	86	Thomas Berwick, Sen.	Lost, Sept. 21, 1850.
Christiana Pitcairn	158	Thos. Berwick, Sen., and T. Berwick, Jun.	Lost, Nov., 1850.
Shooting Star	369	T. Berwick.	Lost, May 19, 1857.
Baronet	311	T. Berwick, Jun., and Johan Berwick.	Lost, March 16, 1860.
Euphrosyne	437	T. Berwick.	Burnt, 1861.
Jane Brown	281	T. Berwick and another (Webb, *Mate*).	Lost, Nov., 1865.
Thomas	51	T. Berwick.	Lost, Nov. 14, 1865.
Severn	1235	T. Berwick (Webb, *Mate*).	Lost, June 15, 1866.

* * * * * *

Mr. Justice BLACKBURN, in passing sentence, said: Prisoners,—After a very long and protracted trial, on evidence which is to my mind perfectly satisfactory, the jury have convicted each of you, and I think they came to a perfectly right decision. What you have urged, Holdsworth, is that in this case there has been perjured evidence against you. * * * I cannot bring my mind to believe that it is in any way consistent with the evidence to suppose that you could have honestly made these insurances, and endeavoured to collect them when the ship was, as I am thoroughly convinced, intended to be scuttled from the first, and was so scuttled. * * * You were acting for persons who sent out the ship that it might be lost. It was a part of the trade, which I am sorry to hear is carried on to a considerable extent. The ship was sent out to be lost; and you, acting as a broker, were quite aware of that. As for you, Berwick, the evidence in your case leads me very clearly to the conclusion that you were the person who sent out the ship as part of that trade. Moreover, the prosecuting counsel inform me that there are other cases, in several of which you were concerned, of ships having been lost, and certainly there is evidence in this very case that your name and repute were such among the underwriters

that you could not insure the ship in your own name, and consequently it was necessary for you to register the ship in another name, or otherwise you could not have insured it. * * * It is a dangerous crime which you have committed, for a ship cannot be cast away so as to lead the underwriters to suppose it perished by the perils of the sea, without exposing the lives of all who are on board. * * * The sentence which I shall pass upon you—and I can pass no lighter one—is that you, BERWICK and HOLDSWORTH, be each kept in penal servitude for the term of twenty years. You, WEBB, have committed a very bad offence. * * * It was actually your hand which executed the boring of the holes. I must pass upon you a sentence of ten years' penal servitude. As for you, DEAN, I shall take into consideration that the jury recommended you to mercy as being under the influence of Holdsworth. I cannot, however, believe that you could possibly have done innocently what you did as to the bill of lading, and as to the insurance of the £1,500 on the cases, I consider it to be an utter impossibility that you could have done that honestly. * * * I feel myself bound to pass upon you a sentence of penal servitude, but it will be the lightest sentence which the law allows me to pass. It is that you be kept in penal servitude for the term of five years.

The case of the *Severn* affords a splendid illustration of the demoralization that attends systematic wrecking; but it does not, strange as it is, convey any idea of the whole of that demoralization. The whole facts can only be appreciated by also including the proceedings of salvors and wreckers. Where a ship is sent down at sea it is bad enough, but when she is, by preconcerted agreement, taken to some convenient rock, or reef, or sandbank, and there wrecked, after due understanding between the master of the ship and the wreckers or salvors as to the division of the plunder, the case becomes infinitely worse. It has not been an uncommon circumstance in the history of wrecking for a master or owner of a ship to pre-arrange with wreckers hundreds of miles away that his ship shall get ashore at a particular place, on a particular voyage, on the understanding that he (the master or owner) shall have a stipulated sum for his part in the transaction. No amount of State inspection will prevent losses of this sort: but subsequent inquiry brings out the facts and leads to punishment. Is not opposition to inquiry, by such persons as Holdsworth, Webb, Berwick, and Dean, in the case of the *Severn*, an exact parallel to the case given by the Rev. Sydney Smith, of a certain class of vermin objecting to the "small-tooth comb"?

INQUIRIES INTO MINOR ACTS OF MISCONDUCT.

We now have to consider cases of misconduct. Acts not arising from a determined intention to act dishonestly, but still serious and prejudicial: such cases as drunkenness, negligence,

foolhardiness, error of judgment, etc., etc. Here again inquiry is necessary, but there are many persons who object to inquiry altogether, and many others who think that the tribunals before which these cases are at present tried, are not proper tribunals for the purpose. With the latter of these, to a great extent we cordially agree; with the former, we have no agreement whatever.

As regards the value of the present tribunal, let us take the case of a master or other officer charged with drunkenness. An inquiry is certainly necessary, but the nature of the charge seems to us to place it among those which should be investigated by a Police Magistrate. Such cases are now often tried by a Local Marine Board. Now a Local Marine Board is elected by shipowners, and consists wholly and solely of representatives of shipowners. The only qualification of an elector is, that he shall be a shipowner of the port where the Local Marine Board is to be established. A Local Marine Board trying a master or a seaman, is simply a tribunal of employers trying the employed. We do not assert that the employers in these cases have been unjust in their decisions, but we do most emphatically assert that such a tribunal is opposed to all sense of justice, and that in no other case would it be tolerated; and we can only hope that some other tribunal may be found.

There is at present also a tribunal to which graver cases are referred, such as strandings, abandonment, etc., etc.—viz., two Justices of the Peace or a Police Magistrate, assisted by two nautical assessors. This tribunal is a very good one for many cases, but as regards others its associations are against it. It is manifestly degrading to a nautical man to find himself in a police court (in which brawlers and low people of all sorts are constantly tried), to be tried on some professional or technical point involving a question of scientific skill or of alleged professional negligence. Here again, whilst we feel bound to object to the tribunal, we feel equally bound to bear testimony to the fact that the cases have been conducted with skill and care, and that substantial justice has always been done. We also think it right to declare emphatically that although the decisions have often been objected to, they have never once been proved to be wrong. The patience of the magistrates, and the professional skill of the assessors are beyond question. One point is strongly in favour of this system, viz., that the extent to which their righteous decisions have caused certain classes to cry out, shews that the work has been well and effectively done. Still our objection to the tribunal remains, and we would say, by all means continue the system of inquiry, but let us, if possible, get rid of the *police* court associations.

We hope that British shipmasters will not cry out against inquiries, lest the cause of their cries be mistaken.

Inquiries on the High Seas and Abroad.

By the 260th Section of the Merchant Shipping Act, 1854—

Any officer in command of any ship of Her Majesty on any foreign station, or, in the absence of such officer, any consular officer may summon a court, to be termed a naval court, in the following cases, *i.e.*:—

(1) Whenever a complaint which appears to such officer to require immediate investigation is made to him by the master of any British ship, or by any certificated mate, or by one or more of the seamen belonging to any such ship.

(2) Whenever the interest of the owner of any British ship, or of the cargo of any such ship, appears to such officer to require it.

(3) Whenever any British ship is wrecked, or abandoned, or otherwise lost, at or near the place where such officer may be; or whenever the crew, or part of the crew of any British ship, which has been wrecked, abandoned, or lost abroad arrives at such place.

A naval court consists of not less than three and not more than five members, of whom, generally, one is a consular officer, one a naval officer, not below the rank of lieutenant, one the master of a British merchant ship, and the other persons eligible as members are naval officers, British masters, and British merchants. These naval courts have large powers. They may supersede the master, may discharge seamen, may settle questions of wages, fines, and forfeiture, may make orders as to the costs of the court, may send officers home for trial, and may cancel or suspend the certificates of masters, mates, and engineers. These courts have been of immense benefit to commercial interests. It can be readily understood that a body of men like seamen, away from the tribunals of their own country, may get impatient of discipline; and that masters away from the check of the owners, and from the jurisdiction of the ordinary courts of law, are likely occasionally to commit acts requiring investigation; or to get into quarrels that can only be settled by some one outside the ship. The naval court exactly meets these cases. There is, probably, no tribunal better fitted for investigating the ordinary questions concerning the safety of a ship, the competency of her officers, and her discipline, than these courts. They are free from the objections taken to Local Marine Board investigations, and to enquiries in police courts. There is not, so far as we are aware, any valid objection to them.

Preliminary Inquiries or Inquests.

Under the Merchant Shipping Act, 1854, sections 432 to 448, inquiry is to be instituted—

Whenever any ship is lost, abandoned, or materially damaged on or near the coasts of the United Kingdom.

Whenever any ship causes loss or material damage to any other ship on or near such coasts.

Whenever by reason of any casualty happening to or on board of any ship on or near such coasts, loss of life ensues.

Whenever any such loss, abandonment, damage, or casualty happens elsewhere, and any competent witnesses thereof arrive or are found at any place in the United Kingdom.

And whenever any ship has been in distress on the coasts of the United Kingdom.

These preliminary inquiries or inquests are held by receivers of wreck, with the assistance of officers of coastguard, or other professional seamen as assessors. The instructions issued by the Board of Trade to officers making these inquiries are as follows :—

In cases where a casualty happens on the coast, and the ship or any of her crew are still there, the officers named above will proceed to the spot as soon as possible, and make the inquiry before any of the necessary witnesses leave.

In cases where the casualty happens at sea, or off the coasts, and any of the crew or other witnesses arrive at any place within the officer's district, he will make the inquiry in like manner.

In cases where he thinks it probable that other important witnesses can be found elsewhere, he will give notice to the officer of the district in which they are to be found, in order that the latter officer may make inquiry.

In making the inquiry, the attention of the officer is specially directed to the question whether the casualty happened from avoidable or unavoidable causes. Amongst the former his attention is particularly directed to the following :

Unseaworthiness or insufficient equipment of the ship. Insufficient or improper manning. Improper loading, over-loading, and bad stowage. Explosions arising from the insufficiency of boilers and machinery. Misconduct, incompetency, or neglect on the part of the master, officers, or crew. Neglect of the regulations for preventing collisions at sea. Ignorance of lights or other sea-marks, or of the navigation of the sea or coast. Neglect of heaving the lead. Too great speed under the circumstances. Non-employment of qualified pilots. Ignorance, incompetency, or misconduct of pilots. Defective charts. Defective or improperly adjusted compasses. Deficiencies in the lights, leading marks or buoys on the coast. Want of harbours of refuge or other means of safety.

In making inquiry on the subject of harbours of refuge, the officer is directed to ascertain and state as accurately as he can, whether one of the harbours of refuge recommended by the Royal Commissioners would have probably saved the ship, and if so, which of them. In all cases where there is any point which it is important to establish, or any question of fact in dispute or in doubt, he takes the evidence in writing.

It is out of these preliminary inquiries that most of the formal investigations have arisen. There is not a wreck or a casualty of any magnitude on the coasts of the United Kingdom, nor of any British ship on the coasts of our Colonies that is not followed by a preliminary inquiry, and the evidence taken is always used in subsequent proceedings, whether by owners, salvors, or underwriters. Looking to the fact that the evidence is obtained on the spot, while the facts are fresh, and before a garbled statement can be prepared, they are undoubtedly of more value than evidence taken elsewhere. They supersede the formal notarial protests, in some cases a mere ingenious tissue of lies, or a tissue of lies without even the merit of ingenuity. The evidence obtained in these inquiries is always referred to in the Admiralty court, and is held to be of most vital importance by underwriters, salvors, owners, etc.; but naturally enough the inquiries are stoutly objected to by the persons whose conduct is called in question. The fact that these persons cry out so piteously tends to prove that the inquests are probing the wound, and are doing their work.

Compulsory Surveys.

The hull, machinery, and equipments of all passenger steamers are surveyed and certificated every six months, and all emigrant ships are surveyed every voyage; but notwithstanding these inspections and certificates, and notwithstanding the various means for inquiry to which we have referred, there are innumerable preventible losses on our coasts and at sea. The life lost is chiefly out of surveyed and certificated ships; but a great number of preventible losses happen to ships unsurveyed and unclassed, and the question is how shall the casualties be lessened. Some people think that the present law is sufficient if it is only carried into effect, and others think that inspection of every ship in the mercantile marine is necessary, practicable, and desirable.

It is not enough to shew these latter people that the greatest loss of life happens in wrecks of ships actually inspected. It is not enough to shew them that the mere fact of a hull and her equipments

being certificated, and of her officers being certificated, does not and cannot affect most of the causes leading to the loss of life at sea. It is enough for them to know that a great number of wrecks happen, and that some ships are old and unseaworthy: and the remedy immediately suggested is a wholesale periodical survey of every ship afloat, with extra surveys on change of cargoes. Argument is useless with such people, reason is thrown away. The system they propose would however simply be madness and would end in legal and certified losses, instead of as now leaving the question of the cause of loss open for inquiry. The advocates of wholesale inspection are running in the dark, they will not be warned by figures like those we have given above, nor will they learn wisdom from the practice in the United States. There the machinery and boilers of every steamship are built under inspection, the very plates of the boilers are certified before they are put in; repairs may only be made where, and when, and how the Government Surveyor directs; there are minute regulations as to the working boilers, the height of water, the pressure of the steam, the safety valves, etc., and yet explosions on board United States steamers are more numerous and more terrible than explosions on board any other steamships. The reason is obvious, for with all the minute statutory regulations, interfering with the business of the shipowner, it would be unreasonable to hold him responsible. If he complies with the law and gets his certificate, his responsibility practically ends, and he himself is not actuated by any fear of loss for the consequences of blowing up his passengers. There is no use in blinking the matter any longer, if we are to go on meddling and muddling, and certifying, we must in common honesty remove responsibility from the owners. Let anyone contemplate such a state of things applied in other cases; let him imagine every Railway Board relieved of all responsibility for the lives of passengers, so long as certain regulations are complied with and certified to. Does any sane man think that fewer lives would be lost under such a system than are lost at present? And yet this is precisely what these persons who agitate for wholesale inspection and certificates are driving us to. Every compulsory survey followed by certificate, tends to lessen the owner's responsibility; and every step by which that responsibility is lessened, endangers life to that extent.

Still after all said and done it must be admitted that some rotten ships are knowingly sent to sea. It is a scandal that can and ought to be stopped. The "finger and thumb" must be ruthlessly plied, regardless of the cries of the little victims, who make their livelihood

by owning "floating coffins." It is a well-known fact that seamen over and over again go to prison rather than to sea, and it is equally well-known that they have now no power of appeal to open inquiry. We have reason to hope that under Mr. Fortescue's Bill means will be adopted to discover whether the seamen are right or wrong in their objections to a ship, and that measures will be taken which will lead to the breaking up of an unseaworthy ship quietly ashore, instead of on some rock in the Bahamas or the Baltic, or instead of her finding a grave in mid-ocean.

By all means let some department of the State investigate allegations of rottenness and unseaworthiness; let the seamen have fair play in such cases; and when a ship is rotten let her be condemned and broken up. But such measures need not worry and delay the business of every shipowner in the United Kingdom. It may possibly be necesary to break up by the strong hand of the law many ships that ought to have been broken up before, but because this is so, it does not follow that every ship afloat should be surveyed and certified. If the law lays it down clearly that the owner is bound to send his ship to sea in a seaworthy condition and properly manned, the seamen and their friends will very soon do what is necessary to enforce the law.

Our paper would hardly be complete without a reference to the subject of

Insurance.

By the English law the assured may by previous agreement with the underwriter determine the amount to be paid by the latter to the former in case of total loss.

It is obviously to the advantage of insurer and insured that value should be agreed upon by both parties before insurance is effected: and it is only in cases in which over valuation is found to be fraudulent that the underwriter can escape payment. Excessive valuation is not in itself sufficient to render the contract invalid. Excess may point towards fraud; but fraud alone opens a valuation.

As between the assured and the underwriter no harm is done by allowing a previous statement and agreement of value; but as regards the public, the system of valued policies opens the door to immorality. It renders possible, and directly encourages deviation from commercial rectitude. Of such deviation, the case of the *Severn*, already referred to, may be taken as an example. Seeing that the system of valued policies opens the door to fraud, many remedies have been attempted, and many suggested with a view to

placing a limit on agreed value as between underwriter and assured. Wagering policies are forbidden by law, but who is to say where legitimate valuation ends and wagering begins?

We have already stated that it is not to the interest of a shipowner to keep his ship afloat, if by losing her he can make more than by employing her. The fact that losses are more numerous in seasons when freight is low, would appear to shew that this is fully appreciated. What we have always felt in discussing questions concerning ships, is that very many points are simple and straightforward in themselves, but the moment the element of insurance is introduced they become complicated, and to a great extent immoral.

It is a remarkable fact that uninsured ships are, as a rule, safer and longer-lived than those insured. We are acquainted with a shipowner who has had but two losses in about forty years, who never insures, and who, in times of depression, has been able to work his ships at a profit when other owners were doing badly: this gentleman would make nothing by losing a ship, and would probably save about £15,000 to £18,000 a year by not insuring. To illustrate the comparative danger of insured ships we shall now refer to certain losses in which there exists no allegation of fraud, or wagering, or over-valuation. In the cases we are about to quote everything appears to have been fair and above board, strictly legal, and we may add, as we conscientiously believe, strictly honest. The comparison we are about to make is between the losses of British certified steamships, and Swedish certified steamships. The facts will be found in the parliamentary papers, and are striking. It appears that in 1868 there were 220 sea going steamships in Sweden. In the year 1867 there were 215 sea going coasting steamers in Great Britain. The numbers are peculiarly close, 220 Swedish to 215 British. The ships in both cases were steam coasters, they were in both cases certified and inspected, and in both cases commanded by certificated officers. In the ten years ended 1867 seventeen of the British coasters were lost under circumstances calling for inquiry. In the ten years ended 1867 three only of the Swedish steamers were lost; and the losses of British ships in the Baltic, as compared with Swedish ships there, in the ten years ended 1868, were ten British as against three Swedish. The Swedish ships were totally uninsured. They could have been insured, but owing to the character of their officers and crews, the owners did not think it necessary.

It must not be forgotten, that what is possible in Sweden and in other countries with a small mercantile marine, is utterly impossible

in a country like ours with an enormous mercantile marine. In Sweden the people are cautious, diligent, and attentive to small points, whereby it happens that their ships are navigated and that goods are carried in them with more care and with greater attention to details of safety, etc., and that cargoes of Swedish ships are, as a rule, delivered in better order than cargoes of English vessels. Our seamen, reckless, brave, riotous, do not shun danger like other seamen. The characteristics of our people render impossible the same methods of procedure as those adopted by others less adventurous and more careful. There can be no doubt that of a certain given number of ships belonging to the various maritime countries and states, the highest percentage of losses will be in the British or American ships, and this is owing to the "go ahead" character of their masters, officers, and crews, as compared with the masters, officers, and crews of ships of other countries and states. Our legitimate losses will always be higher because we run more (legitimate) risks. To lessen losses from these (legitimate) risks we must change the characteristics of the Anglo Saxon race. Our illegitimate or fraudulent losses will also always be higher, because, owing to the vastness of our business in connection with ships, frauds are more easily concocted and less easily detected with us than with our more easy going and less occupied neighbours. To lessen the fraudulent losses has ever been the desire of thinking men. Fraudulent losses would cease to pay if over insurances were rendered impossible. Many thinkers have therefore attempted or suggested a remedy in the direction of limiting insurance.

A suggestion having this object in view has been made that every ship, besides having an official registered name and number, shall have a declared and registered value, which may be called her official value; and that this official value shall be that on which dock dues and light dues shall be levied, and liability, etc., be calculated and paid. This official value it is proposed shall be stated and declared at the commencement of every voyage, and shall be binding for the voyage, and for all results of the voyage, both for and against the owner. It is then further proposed that to insure a ship for the whole of her declared or official value, shall be rendered absolutely illegal. A gentleman eminently qualified to give an opinion on the subject writes as follows:

"I would propose that instead of a liability of £8 per ton for property, and £15 per ton for life and property together, as now, it should be a proportion of the value of the ship, say for example, half for property, and three-fourths for life and property together, or any other proportion of value thought to be more equitable.

"That for the purpose of ascertaining such value, the owner, agent, or captain be required to declare the same at the Custom House on entering the vessel outwards upon any intended voyage, such valuation to be perfectly voluntary as to amount, but when once made, to be *binding* for that voyage, and for all results of the same, both for and against the owner of the vessel.

"That should the owner, agent, or captain omit or refuse to so declare the value, the customs shall assess it prior to permitting the ship to be cleared outwards, and such assessment shall be taken as the value both for and against the owner for such intended voyage, and for all results of the same, and shall remain in force until the owner or his agent shall give his own valuation; such new valuation, if given, to apply to any subsequent voyage, so soon as the vessel shall have completed the one already commenced, and have been moored for twenty-four hours in good safety.

"The principle of liability, proportionate to value, I venture to think, would be more equitable as relating alike to steamers,—of which the average value is much more than £15 per ton,—and to sailing vessels,—many of which, of course fall far below that value,—than the one at present in use by which both are liable for an equal amount per ton, although their values are so exceedingly different.

"The voluntary valuation of his ship by the owner for all purposes before commencing a voyage, and so prior to any accident occurring thereout, would greatly tend to prevent disputes in subsequent events, and, if it were thought desirable, a power of appeal to an authoritative assessment of value might still be retained in favour of any parties aggrieved, excepting the owner who had voluntarily given his own valuation; although, judging from the VERY RARE instances of 'opening the valuation' occurring in the case of goods valued in a policy, it would in practice seldom be required in reference to ships."

In some countries by express law, and in others by custom, insurance is limited to a proportion (say three-fourths) of the value of the property. The Right Hon. Stephen Cave, M.P., in speaking of this subject, stated—

"When these questions were laid before me in former days, three remedies were constantly pressed upon me. One was to limit the insurance, and the other was to declare the sending of a ship to sea in an unseaworthy condition to be a misdemeanour; and the third was to have a loading line. I have always been in favour of the limitation of the insurance, but an opposite opinion prevailed among some members, and perhaps that opinion was right."

In the United Kingdom the principle of limited insurance is acted on in many of the country clubs, especially in Wales; but these clubs all have surveyors, by whom the ships are surveyed and valued before insurance is effected. They know each other's ships, and this knowledge and the usual jealousies, prevent concealment of defects. Such a system, although workable in country clubs, where weeks can be taken over one transaction, is deemed to be impossible in large communities, where business to the extent of £1,000,000 may be done in six hours.

Underwriting, to be carried on as at present in such places as

London and Liverpool and other great commercial centres, must be carried on with facility and despatch. To keep premiums up, the element of competition should be excluded, and large companies, or very respectable persons alone should be allowed to underwrite. But to keep premiums down, every company should be allowed to compete with every other company, and every member of a company with any member of the same or any other company. Premiums are lower now than ever. A London underwriter does not enter into minute details of particular defects; he calculates and takes his risks by actuarial rules, the result of general deductions from broad premises. An underwriter who, before underwriting any risk, would make inquiries into every minute detail of the build and equipment of the ship, the character and antecedents of her master, owner, etc., would never be able to do any business in London. An insurer, as a rule, seldom sees a ship and never sees a cargo he insures. An underwriter, sitting in his room in London, insures property in ships at Hamburgh, New York, Bombay, Calcutta, Sydney, etc., etc., as well as in ships in various places in the United Kingdom; he cannot, therefore, by any possibility make personal inspection or even personal inquiry. It may be asked, Why then should he underwrite in such cases? This is a very proper question for anyone to put who is not acquainted with the business of underwriting, but to anyone who is acquainted with that business the question is ridiculous. A merchant having to send home £100,000 worth of goods from the East, insures the whole to be sent home by a ship or ships. He insures partly in London, and at the time he insures, even the ships by which the goods are to be sent home may not yet have arrived in the East, and are not known to him. Underwriting is a business done on trust and mutual understanding—it is essentially a traffic of confidence. To prevent underwriting would really be to stop commerce. Facilities for underwriting are a commercial necessity; to interfere with those facilities would be to hamper commerce by delays and to raise premiums. To raise premiums is to put a heavy burden on shipping. Underwriting is an absolute necessity, and its accompanying frauds are, we fear, an inevitable part of it. Admiral Halstead, the late Secretary of Lloyd's, in speaking on this subject at the United Service Institution, said :—

"The remedy for shipwrecks? I do not pretend for one instant to be able to provide a remedy, and I do not know anybody who can undertake to say what is the remedy for shipwrecks; but I will tell you this. If I could go on the Stock Exchange to-morrow morning, and by holding up my hand could put a stop to all future shipwrecks upon the coast—(I am now speaking advisedly)—

it would be a question how I should get safe with life off that Exchange. I do not know whether there be present or not a party more interested probably than most of us, who I may term a representative underwriter of Lloyd's, and with whom upon this very subject I had a very interesting communication of some hours not more than a week or ten days ago. When I put that position to him, he said, "It is perfectly true; you would stop our bread." I may say that this is not at all an individual case. There is the statement which was made to me the other day openly; it was not in secret; it was said openly and publicly at Lloyd's, that the whole question of our insurance did involve more or less of fraud, and that ships are purposely wrecked."

The rapidity and facility with which insurances are, and must necessarily be, effected, must, of course, directly open the door to fraud; and it so happens that ships and cargoes that have never existed have been insured, and it is not until a heavy claim is made for a fraudulent loss, or accident discloses the particulars, that the fraud is found out. As examples we may mention the cases of the *Poseidon* and the *James*. One of her Majesty's consular officers invented a ship which, in his capacity as Godfather, he called the *Poseidon;* and he then invented a cargo of oil, which, in his exceedingly fertile imagination, he shipped at Adramytti. He then issued "a clean bill of health" for the ship, which is in effect the same as a Custom House clearance, and it was said that she sailed from Adramytti. Insurances were duly effected in London on the mythical ship and cargo to the extent of £12,000. He subsequently caused a report to be sent to Lloyd's that a vessel had been seen burning at sea off the Isle of Lemnos.

To the astonishment of every one but the consular officer, the *Poseidon* did not arrive in England: and in due course he produced a certificate of a Greek consular agent that the *Poseidon* belonged to Tenedos, that she left Tenedos to load oil, and that no news had been heard of her. He also produced a certificate to the effect that burnt ship timber had been seen at sea, as well as certificates as to the clean bill of health, that the ship did load oil at Adramytti, and that she did actually sail for England. And yet the whole was a pure invention from beginning to end. The consul was unfortunate in being detected and adequately punished, but compared with real cases like the *Severn*, in which life is often sacrificed to obtain premiums, the *Poseidon* was a practical joke, improper and fraudulent, but playful and harmless.

So also was the case of the mythical smack *James*, and her equally mythical cargo of bloaters. This is the next case we mention, but it is not by upwards of a score the next in rotation.

In the case of the *James*, one Brown, describing himself as a fishcurer at Gravesend, called at the offices of the Monarch Insurance Company, and

effected a policy of insurance on the smack *James* and 100 barrels of herrings for £200 on a voyage from London to Fécamp. A week afterwards he called again at the same office, accompanied by a boy named Terry, and told a pitiful story to the effect that the vessel sailed from the Thames on a certain day with the master, Thomas Moore, the mate, another man, himself and Terry on board; that on the following day (Sunday) about noon she struck upon a piece of floating wreck about two miles off the North Foreland, and almost immediately afterwards sank; that the master, mate, and another man went down with her; that he and the boy Terry, who were in the cabin at the time of the collision, barely escaped with their lives in the boat of the smack, and were afterwards picked up by a French lugger and landed at Margate on the same (Sunday) evening, whence they were sent to London by the agent of the Shipwrecked Mariners' Society. The circumstances so stated were afterwards embodied at the instance of the prisoner Brown in a formal protest, the truth of which both prisoners declared before Mr. George Matthew Arnold, a notary at Gravesend, and upon the production of that and the observance of other formalities the insurance company handed the prisoner a cheque for £200, the amount of the policy. It was afterwards proved that the boy Terry was at home at Gravesend on the Sunday until after the time at which the smack was alleged to have sunk, and that about three o'clock that afternoon the prisoner Brown and he took train at Gravesend and proceeded to Margate, where they arrived about five o'clock. They then proceeded to the jetty, where they were seen about six o'clock, and about eight the same evening they called there upon Mr. Stranack, of the Shipwrecked Mariners' Society, and having told him the story of having been shipwrecked and landed that evening at the jetty by a French lugger by which they had been picked up, he gave them money to buy provisions and a free passage to London. There was evidence to show that there was no such smack as the *James*, that no cargo of herrings had been shipped by the prisoner Brown from London to Fécamp, and that in short the whole story told by him and on which he obtained the £200 from the Insurance Company was a fabrication from beginning to end. It transpired also that the prisoner Brown had previously effected policies in five different offices for £1,350 altogether, and received the whole of the money.

Mr. Justice Byles, in passing sentence, said: The case against Brown was very serious, and an offence which it was necessary to put down by a severe sentence, especially now that the charges for insurance were so very low, and insurance companies were entirely at the mercy of persons who were not more restrained by principle than the prisoner. The sentence was that he be kept in penal servitude for fifteen years.

So long as underwriters do their business in such a rapid manner as at present, taking no means, or at all events, no adequate means to ascertain the state or even the existence of property they are insuring, it is indeed a hard case if a designing man cannot sometimes make them suffer; and were it not that life is often lost in the transaction, our sympathies would be with the sharp defrauders rather than the underwriters, because their business encourages attempts at fraud. In Italy, France, and Spain, where the mercantile marines are small, and where all sorts of formal precautions are taken, frauds are not uncommon. For instance, it is

not long ago that some speculators obtained possession of certain ships, seven in all, comparatively worthless, insured them, lost them, and recovered insurance. One of the ships was partly insured in London, about £12,000 was the London risk, and she was wrecked near our coasts. Her reputed cargo was wines, liqueurs, etc., but was in reality rubbish, brown paper, etc. The outside value was not more than £500. We refer to these instances of fraudulent wrecks of foreign-owned ships to shew that all the care of a continental system does not prevent them, and we could give many similar cases of Spanish, French, Italian, American, and other ships.

Whatever our legislature may do in the matter of unseaworthy ships will be a step towards assisting the underwriters, and the underwriters on their part ought to set on foot some organization or system whereby certain men will for ever be placed in their black books; they ought also to look out lest "for a consideration" some old TRAPBOIS allows his name to be used to cover the designs of an owner on the black book.

Seeing that ships and cargoes must continue to be insured, the next question for consideration is, whether insurance cannot be limited to say three-fourths of value. We can only now glance at it, but it is to be hoped that some one may be found to go to the bottom of the subject at an early day.

If ships are over-valued for the sake of recovering a good round sum in case of loss, we must not forget that the premiums paid are on the assured value. An over insurance of £5000 imposes a burthen of £600 a year. If instead of assuring to the whole four-fourths of value, an owner could insure only to three-fourths, he would pay only three-fourths of the premiums. Assuming that at present an owner can overvalue a whole ship, he could of course also grossly overvalue three-fourths or four-fifths of her. The only difference would be that in one case, the latter, he would perhaps practise on a lesser sum, whilst he would pay less premiums than in the other case. In Spain, where the limit is two-thirds, the owner always overvalues so as to cover the whole interest. If it were only possible that the value of a ship could be put down at a certain sum per ton for all purposes both for and against the owner as proposed, then the proposed limitation of assurance would be easy, but would still, we think, be unjust. We shall, however, shew that a ship cannot be of one and the same value for all purposes, and that, therefore, she cannot be declared to be so. Valuation necessarily divides itself into four heads:—(1) Valuation between underwriters and assured. This is almost the only means

of fraud, and yet it can never be done away with. (2) Valuation for general contribution. This has nothing whatever to do with value for insurance. (3) Admiralty court value for salvage. (4) Statutory value for cases of collision, etc. These values are all independent of each other, and must remain so. If A, one ship-owner, were to be liable to B, another ship-owner, according to the value fixed by A and B together, it would be to A's advantage to fix the value no higher than the market value, and it would not be to B's detriment, because B could get no more than that sum in the market; but in a matter of insurance between A, a shipowner, and C, an underwriter, such a value might be obviously unjust to A.

By the present law an owner is by no means required in a valued policy to fix the value of his ship, at what she will sell for at the moment in the market at the place where the insurance is effected. It would be most unfair to compel him to do so. A ship specially built and fitted up for a special trade, say for laying a telegraph cable, for summer traffic with holiday-makers in the Highlands, for raising heavy weights and wrecks, for docking ships and vessels (the Bermuda Dock) for a special intercolonial or foreign trade, any one of such vessels might and probably would fetch in the ordinary market almost nothing,—but for her owner's purposes she would be especially valuable, and may actually have cost more than any ordinary ship of similar tonnage. She may be sent to her destination by a special crew in a special manner at great cost. On the one hand the owner of the ship who has been at special expense not only in fitting her out but in sending her specially to her work, would be hardly dealt by if he could only insure her for what she would fetch at a certain place at a particular time; but on the other hand because he has insured her for a sum that really represents her lowest value to him, it would not be just to say that as regards damage done to another ship or to life, such a special ship should also be assessed at the high value for which she is insured. Take the caseof collision between two ships of similar size. If A the ordinary and less expensive one were in fault, her owner would be liable to B to the extent of say £20,000, whereas if B were in fault, he would be liable to A under precisely similar circumstances for say £40,000, this not because she was in any way for sea-going purposes or trade a better ship than A's ship, but either because she had cost more, or because her loss would involve her owner in greater pecuniary losses than the loss of an ordinary ship, and he had insured her for more.

Again, in the case of a ship built and sent out for a special purpose, or as in the case of wreck raising or telegraph cable laying

ships kept idle half the year. If value is to be taken as a basis on which to pay dues, those dues could only equitably be levied on the stated value whilst the ship is employed on her special work. This would give rise to all sorts of complications, and as regards dock owners, it is not easy to understand why they should charge one of two ships A twice as much as B if A and B are both of the same tonnage and size and occupy a like amount of dock space, merely because owing to the special purposes for which A is required, her owner has had to lay out on her and insure her for twice as much as has been laid out on B. If however, the proposed official valuation is not intended to apply to ships in dock we should have two values, one for voyages and one for port purposes.

Again, supposing that A wants to sell his ship, is the declaration of value to nullify the sale or prevent the sale if he cannot get the fixed value for her? Probably that is not the intention of the proposer, but considering that a ship can be and often is sold during her voyage, and considering that the official value shall be the value for all purposes for and against the owner, it might have this effect; and if it is not intended to have the effect of preventing a sale for less than the declared value, then a fraudulent or colourable sale for a small sum would interfere with the whole arrangement.

And again, supposing that A were to run into dock gates or through a jetty, the stoppage of the whole business of that dock or of that jetty might result, and the actual loss inflicted on the owner might be much more than the official value of the ship, and life might be lost besides. It is surely better to leave the liability of the owner unlimited in such a case (as at present), than by limiting it in one case and for one purpose to inflict positive injustice in other cases. The proposed scheme of official value necessarily provides that it shall be perfectly optional with the owner to fix or declare the value at what figure he pleases, but the value declared, shall it is proposed, be the value for all purposes. But suppose that the declared value, which is to be optional, is only to be declared for purposes of insurance, we may be sure that if the owner is about to lose his ship he will not declare that value at too low a figure. And if this is the case it appears to us that not only will the remedy fail even in the special case of insurance, but that so far from the proposal having a tendency to check over valuation where a check is required, it would really give an official sanction to dishonest over valuation.

And again, let us assume without admitting that the scheme of declared valuation of ships and limited insurance of ships could be carried into effect. It would utterly fail to realize the intention of

its framers unless the rules were also applied to goods carried in the ship, as well as to the ship itself; and it would fail even then unless power were given to inspectors to open every package to ascertain its contents. Such powers and proceedings would simply mean the entire stoppage of trade. If a man wished to recover money by fraudulent over-valuation under the proposed system he could still do so. The only change of practice necessary on his part would be that his jugglery would be especially directed to the cargo rather than to the ship. He would have to ship rubbish in packages, as in the case of the *Severn;* and the question is whether in doing so he would not gain more money and suffer less risk of detection under the proposed system than at present.

We think we have shewn that to attempt to fix one value for all purposes would be to attempt to do what as a matter of fact is untrue. It is better to leave liability as it is and to leave declared value as it is. As regards insurance if it is to be limited, which to us seems impolitic, it must either be limited by market value which must be manifestly unjust, because market value may be as we have shown by no means the real value to the owner; or it must be limited by the estimated value to the owners, a value that can only be stated by the owner for acceptance by the underwriter, a valuation that although offering facilities for fraud, affords more facilities for honest business than any other valuation. Perfect freedom is the safest principle in this as in all other commercial transactions. We think it will be clear that insurance can be no more limited than it can be destroyed.

(To be Continued in our next.)

EXAMINATIONS IN STEAM.—We are glad to announce that we have obtained the Services of an Examiner in Steam attached to the Board of Trade, to furnish matter for a series of papers on Steam, to be commenced in our next number. All masters of Steamships require a certain amount of knowledge respecting the working of the engines, whether they intend to pass an examination in Steam or not, and we believe the information we propose to publish will be most useful to all. Sir W. H. Walker has expressed a most favourable opinion on the form and style of the papers, and they will be edited by a gentleman who has already largely contributed to our New Series.

MAGNETIC VARIATION.

[The following useful table of observations has been kindly sent to us for publication by the Astronomer Royal.]

TABLE

Showing the Mean Monthly Westerly Declination of the Magnet, and the Mean Monthly Dip at the Royal Observatory, Greenwich, in the Year 1870.

1870.	Variation W.			Dip.		
	°	′	″	°	′	″
January ..	19	57	28	67	54	16
February ..	19	56	44	67	53	42
March ..	19	56	21	67	53	44
April ..	19	55	6	67	52	38
May ..	19	54	50	67	52	15
June ..	19	52	52	67	51	5
July ..	19	52	57	67	50	53
August ..	19	52	16	67	52	48
September ..	19	51	55	67	53	24
October ..	19	51	40	67	52	41
November ..	19	51	18	67	52	30
December ..	19	50	26	67	51	45

The mean variation has been found by the application of corrections (deduced from the reduction of the magnetic observations for the period 1858-1863) to the means of readings taken at 9h. a.m., 1h., 3h., and 9h. p.m. daily.

G. B. Airy.

February 24th, 1871.

YACHTING AND ROWING.

In reference to Yachting there is retrospectively and prospectively little of importance to be said; while the present time, even with Mr. James Ashbury to the fore, is as nearly as possible barren of interest.

That long winter interregnum

"Ah, bitter chill it was!
The owl, for all his feathers, was a cold;"

is yet scarcely at an end, the lamb and mint sauce notwithstanding, albeit balls and rumours of balls have to some extent ceased to

pleasantly trouble the yachting mind—and feet. How it came to pass we cannot tell, but the skaters' winter of 1870—71 has been beyond all its proximate predecessors, distinguished by an eruption of newspaper correspondence relating to yachting and its surroundings. We almost shudder to think of it. What is there in the sport to provoke otherwise amiable, Christian gentlemen to rush into print armed at all points—of the pen—like so many amphibious Juniuses? A nobleman whose self-denying allegiance to the sport of his adoption has never for a moment been questioned, conceives the idea that it would be well to amalgamate all the Yacht Clubs of the Thames, into one large and powerful body; he communicates his suggestion to the leading sporting journal, and is soundly rated for his pains! There was not the least harm in the world on the score of "taste" in one of the objections to Lord Alfred Paget's proposal. There is much to be advanced in favour of a big prize—say one of £250 or more—to be open to members of this proposed amalgamated club, but it seems to us, more against it. "Little fish are sweet," says the proverb, and so, in effect, thought a well-informed yachting man, who, in reply to the letter of the Commodore of the London Yacht Club, argued in favour of £100 prizes and *pari passu* against the amalgamated club. By spreading such prizes over consecutive days—wrote he—you naturally secure variations of wind, and thereby afford chances to different capacity, whether it be in size, build, or rig. So think we. Into the "differences" which led to the establishment of the Royal London and the Prince of Wales Clubs, we do not care to enter. We are glad to think that both the Clubs and their common parent are robust existences, and likely to remain so for many seasons to come, and are heartily sorry to know that in reference to this same idle question of the origin of the younger bodies, it was deemed requisite by one contributor to the above controversy to cast unworthy imputations, involving an ignoble matter of £ *s. d.* Perhaps it is not in strict chronological order to mention him next, but since Mr. James Ashbury has lately monopolized so much public attention in this country and America, let us make honourable mention of him here. Mr. Ashbury's pluck and enterprise are undeniable—he has deserved well of his country, and all that sort of thing—but we wish he would not write and speak (after dinner) as though the gaze of the whole civilized world were upon him. It is possible to have too much even of Mr. Ashbury. It is quite possible that he has "done more to cement the friendship between the countries of England and America than has any private gentleman hitherto done," but we doubt it—and we are not thinking of the late Mr. Peabody, either.

There never was a more fatuous idea. National alliances are not cemented in this way. Now although it would be unfair to the American people to accept the *Spirit of the Times* as an exponent of their feeling regarding the ever-memorable ocean match between the *Dauntless* and the *Cambria*, we must not forget that Mr. George Wilkes's journal represents a somewhat powerful section of the yachting community across the Atlantic. When Mr. Ashbury came home, he made a speech, and this is how the *Spirit* dealt with his oratorical effort: "He is much given to speech-making and letter writing, and a flow of ideas and fancies, a great deal faster than the winds which propel his yacht, almost invariably run away with him. He is largely indebted to his imagination for his facts and his memory for his arguments." This is pretty well as a Yankee comment on the English belief in Mr. Ashbury's friendly cement of the two countries.

The Yankees have two conspicuous causes of complaint against Mr. Ashbury. They declare that he has misrepresented the American success of the *Cambria*, and that he seeks an unfair advantage in challenging for the cups won by the *America* in 1851. Hear him on both charges: "I admit your yachts of about equal tonnage to the *Cambria* (such as the *Palmer*, *Phantom*, *Tidal Wave*, *Idler*, *etc.*) would generally in a light wind, up to a seven or eight knot breeze, beat the *Cambria*, but outside Sandy Hook in a stiff breeze, I consider the *Cambria* would beat any yacht in America of about her tonnage." He further says—"As regards the '51 cup, my challenge for it was vessel against vessel of about equal tonnage, but the N. Y. C. ruled by, I think 18 to 1, that it should be an open race. I entered not as approving or endorsing their opinion, but for sport, and with the slightest possibility of winning. I have again carefully read the deed of trust under which the cup is held and I am confirmed in my opinion, that I or any duly qualified yachtsman can compete for that cup against one vessel, and not the fleet; and it will be for those owning fast vessels such as those now building, the *Sappho*, *Dauntless*, *America*, *Fleetwing*, *Tidal Wave*, *Phantom*, *Palmer*, *Idler*, *etc.*, to organize a series of races to demonstrate which should have the honour of alone representing the club, and to prevent if possible, the cup returning to England." Mr. Ashbury proposes to throw down the gauntlet to the Yankees with the *Livonia*, a schooner of 280 tons recently launched from Ratsey's yard. Opinions—all of them premature—appear pretty equally divided, as to the model, but from all that we hear she is likely to add to the fame of the builder, and eclipse that of the *Cambria*. An unfriendly critic describes her as a hybrid sort of cross between the *Sappho*

and *Cambria*. Just by way of infusing a little common sense into the ever-vexed question of the merits of American and English yachts, let us recollect the broad distinction between the two fleets. The American yacht is *per se* a racing machine; in building an English yacht, while every effort is made to secure speed, accommodation below, and that of the snuggest and most complete description is never sacrificed. It cannot be said of English yachts as has been said of the American, that "they are all vessels with low hulls, long sharp bows, extremely taunt spars, and rigging and gear so light, one began to wonder if it could ever hold on; that the hulls are shallow, and the accommodation below" not worth mentioning.

Already the papers begin to bristle with fixtures for the ensuing season. The ball of the Royal Thames Yacht Club will take place on the 2nd of May. The opening cruise of the New Thames will be on May 13th; the commodore to hoist his flag on board his yacht *Nettle* off Gravesend at noon. The Prince of Wales Club has fixed the 22nd of next month for the opening day; yachts to assemble at Erith, and proceed to Gravesend. The Ranelagh begins the season on the 6th of May; the rendezvous is North Woolwich, and the opening cruise will be to Gravesend. May 30th is the date fixed for the first match in connection with this club. The Temple Club has decided upon the 21st of June for the opening match. We are glad to note that a more or less abundance of funds distinguishes all the clubs, including the Royal Mersey (whose commodore will hoist his flag on the 28th or 29th of June) and the Royal Alfred, about both of which provincial associations we hear capital accounts.

Our own snug little island no longer monopolizes all the skilled amateur and professional rowing in the world, as it practically did in the slow days before a poor Northumbrian pitman conceived the idea of the present wager outrigger. No glance at this part of aquatics—to borrow a word from the sporting journals—would be complete, unless it took in Canada, the United States, and Australia. Harry Clasper's outrigger is now as well known to the graduates of Harvard and Yale, to the sturdy ironworkers of Pittsburgh, U. S., and to the hardy Canadians, as it is to the coal-smirched thousands who cheer a well-fought "skiff" race from the High Level to Scotswood Suspension Bridge, or the more motley multitude that hurrahs hoarse encouragement to dark and light blue when one or the other is "a length ahead at Barnes!" This a rare honour for the work of poor Harry's shrewd head and deft hands to have achieved. Almost as far back as we can clearly remember, they were racing in Clasper's outriggers, and at this present writing, eight Cantabs are training for the race (which will be decided a few hours after

these words are in type) in a boat from the *atelier*,—it shall not be called a shop!—of John Clasper, the inventor's youngest son. And then, marvellous to relate, even the Yankees have been unable to improve upon the old pitman's "notion!" The outrigger of the veteran's Yesterday is that of his sons To-day: To-morrow must take care of itself. The topic which in a good many minds conflicts with the latest news from Paris, is the forthcoming "'Varsity" race. Predictions of events that have happened are only diverting when they happen to be false. The majority of the subscribers to the *Nautical Magazine* are not unlikely to be made acquainted with the result of the boat race about the time when they have cut these leaves. Nevertheless, writing as we do about a week prior to the race, we "venture," as Mr. Gladstone would say, to express an opinion, whether that be borne out by results or not. The Cambridge crew is better than last year's, by chalks; but as was the case last year the weakness is in the middle of the boat. They row in beautiful time; the style is good, but there is a want of what north-countrymen call "pudding" about it, which will tell on the day. They neither get back nor forward—certainly not forward—far enough to suit us, and if they should beat Oxford—which crew we have just seen, and greatly admire, well——! They have two points in their favour, an admirable stroke, and a "ship" swift and "sweet" beyond aught that was ever turned out of a builder's yard. The daily journals are regaling their readers with towing-path legends,—"it is their nature to." Some of these are too exhaustive. For instance, the loss to the boat in consequence of the absence of Mr. Strachan is bewailed, and the fact of that young gentleman being "in residence" suggestively announced. We are glad to know that he is in residence; but our joy is tinged with sorrow when we learn that his present place of abode is somewhere in New Zealand.

The Tyne is at last going to hold a regatta, worthy of the name and fame of the coaly river. There is no lack of money, and will, therefore be no lack of sport. It will be requisite for the committee of management to exercise great care in drawing up the conditions of their amateur races. The broad distinction between a professional and an amateur which at present obtains on the Tyne, would not do on the Thames; and on the other hand, the sharp line which the Thames draws between "tradesmen" and amateurs, would hardly meet the views of the radical Tynesiders. If Thames and Tyne amateurs are to meet on common ground, the question of qualification must be so clearly adjusted, as to prevent those bickerings and heart-burnings which, given the least vagueness in the conditions, would be safe to occur. At a meeting of the members of the Dublin

University Boat Club, held a few weeks since, the principal speaker (president, secretary, or treasurer,) indulged in a crow over the D. U. B. C.'s past successes. "The senior pair and four had won no fewer than twelve races in England, Ireland, and Scotland,"—so far, well, but the following, an unlovely glorification of pot-hunting had far better have been left unsaid—"representing over £600 in cups, making an aggregate of twenty-two races and £927 worth of prizes won in the year 1869—1870." Our counsel to these Dublin "bhoys" is to talk not thus of the money value of the races they have won. In spite of ourselves we connect those gold and silver cups—prospectively—with the golden balls round the corner. Yet let them come to Henley again and give us "the best of batings, and it's ourselves will like yees all the better far it."

The professional rowing world is quiet. No event of magnitude has stirred its calm since Renforth and Kelley defeated—run away rather—from that pair of respectable mediocrities, Winship and Taylor. It is too late in the day, or we might re-tell the story of that memorable match. Sufficient to say that it arose out of a quarrel between Renforth and Taylor during the race with the St. John's crew in Canada, as to the respective merits of the two boats they had brought from England—a Dunston (Renforth's fancy) and a Jowett (Taylor's). The feud, unhealed on the return to Newcastle, took the shape of a challenge on the part of Renforth to find another man and row any pair in the world over the Tyne champion course for £200 a-side. Taylor accepted the challenge, and Renforth named Kelley. For the first time since the world began, Thames and Tyne fought Tyne, and the alliance won. We see there is the prospect of another International Match, between the St. John's crew and the English champion professional four. This is not all. The Australians are again anxious to try their oarsmen with the best in the old country. This time however, not in a single sculling match only, as on the occasion when Chambers defeated Green, but in a match with fours, and probably a single sculling match into the bargain. The crew would probably comprise W. and R. Hickey, Rush, and Culone; and the champion sculler, either Rush or W. Hickey. An enthusiastic "native" writing on the subject says that, "Green could always beat Kelley when they were training together." So he could *for a mile;* but after a mile Kelley could do as he pleased with the Australian. Talking about Kelley, recals a characteristic challenge which he has just issued. He "and an amateur, whose united ages amount to 82 years, will row any other professional and amateur, whose united ages are the same, etc." Who is this amateur? We prophecy Mr. Charles Bush.

THE LIFEBOAT WORK IN 1870.

AGAIN has the National Lifeboat Institution been enabled to place before a crowded annual meeting of its supporters, held at the London Tavern on the 14th March, a satisfactory account of its work on the coasts of the United Kingdom during the past year. The President of the Society, The Duke of Northumberland, occupied the chair. There were also present, amongst others, The Earl of Devon; Thomas Baring, Esq., M.P., F.R.S.; The Hon. Dudley Fortescue, M.P.; Thomas Chapman, Esq., F.R.S., V.P.; Sir Edward Perrott, Bart.; Major-General Moore; Admiral Richards, F.R.S., Hydrographer of the Admiralty; The Earl Percy, M.P.; Captain Mangles; W. H. Harton, Esq.; Sir James Tyler; Admiral McHardy; Colonel Fitz-Roy Clayton; Admiral Sir William Hall, K.C.B.; The Earl of Courtown; Sir William Clayton, Bart.; Rev. E. Howlett, M.A.; Admiral of the Fleet, Sir George Sartorius, K.C.B.; Captain R. Robertson, R.N.; Admiral Evans; Captain De St. Croix; Francis Lean, Esq., R.N.; Captain Howes, R.N.; Dr. Hamilton, R.N.; Lord Garlies, M.P.; The Right Hon. Sir Robert Peel, Bart., M.P.; Captain The Hon. F. Maude, R.N.; Colonel Palmer; Dr. Ray; Captain Sir Frederick Arrow, Deputy Master of the Trinity House; and many others.

After some brief remarks from the Chairman—Mr. Lewis, the Secretary of the Society, reported that the Committee of the Institution tendered their warm thanks to all those who, by their donations and annual subscriptions, have enabled them successfully to prosecute the important national duty which they had undertaken, and they desired to express their gratitude for the Divine blessing which had rested on their labours.

It was true that, in reference to the funds, a considerable diminution had occurred in the contributions of the year. The Committee, however, felt sure that that fact need not be attributed to any falling off in the sympathy and interest of the public in the work of saving lives from shipwreck; it was rather to be accounted for by the urgent demand for aid to the numberless victims of the fearful struggle which, during the latter months of the year, was raging between two neighbouring nations on the continent of Europe.

The transactions of the Institution during the past year may be thus summarized;—

Fourteen new lifeboats had been placed on the coast, and stationed at the following places :—

ENGLAND.		SCOTLAND.	
Durham	Seaham.	Banffshire	Buckie.
Lincolnshire ...	Chapel.		Banff.
Norfolk	Palling.	Forfar	Buddonness.
Suffolk	Gorleston.		
	Pakefield.	IRELAND.	
	Kessingland.		
	Thorpeness.	Co. Londonderry ...	Greencastle.
	Aldborough.		
Kent	Kingsdowne.		
Devonshire	Morte Bay.		

New transporting-carriages and boat-houses had likewise been provided for several of the above boats.

The Institution had now two hundred and twenty-eight lifeboats on the coasts of the United Kingdom and the Channel Islands. During the past year these boats had rescued five hundred and thirteen persons from a watery grave, nearly all of whom were saved under circumstances which would have precluded their rescue by any ordinary description of boat.

The Committee were thankful to say that although many of those services were of a most difficult and dangerous character, yet that they were performed without serious accident to any of the lifeboats, and without the loss of a single man amongst those by whom the boats were worked.

Although the shipwrecks during the past year were, on the whole, neither so numerous nor so distressing as usual, yet the fearful catastrophe of the foundering of H.M.S. *Captain*, with 500 persons on board, in the Bay of Biscay, during a gale of wind, sent a thrill of agony throughout the land, paralleled only by the wreck of the *Royal George*, which occurred nearly a century ago.

The following brief account illustrates the able and determined courage displayed by the warriors in the lifeboat cause :—

"In the early part of the year a strong gale from the S.E., with a tremendous sea, was everywhere raging on the shore at Montrose, on the east coast of Scotland, when a partially dismasted schooner, which turned out to be the *Dania*, of Aeroeskiöbing, in Denmark, was observed to be at anchor in Bervie Bay, about twelve miles north of Montrose, in a very dangerous position. The rocket apparatus from the nearest coastguard station was soon on the spot, but the vessel being too far from the shore to be reached by it, a telegram was at once sent to Montrose for the lifeboat and a steam-tug to come to the aid of the schooner and crew. As soon as practicable, the lifeboat *Mincing Lane* was launched, manned by the well-known and skilful Ferryden fishermen, and was

towed to the harbour's mouth, when it was found that the sea on the bar was too heavy to admit of the steamer being taken through it. After some consultation the coxswain and crew of the lifeboat determined at all risks to cross the bar, if possible, and perform the service without other aid than their own strong arms and wills; and off they went, followed by the anxious gaze and hopes of the spectators on shore. The seas on the bar are said to have been terrific; yet as each wave broke heavily over the boat, one throwing her up almost perpendicularly, she nevertheless steadily surmounted them; and when over the heavy lines of surf on the bar, her oars were taken in and sails were set, and in an hour more she had reached the distressed ship. Owing to the heavy sea, it was still a work of no slight difficulty to get her crew on board, who, standing on the stern, had to avail themselves of the brief moments when the boat was raised high on the summit of a wave, and thus one by one they jumped into her, and all got safely on board. It had been thought that the lifeboat would then have had to run to Stonehaven, ten miles farther north, with the rescued men, but fortunately the wind had veered more to the east, and she was enabled to return with them to Montrose; to the no slight joy and relief of those who, with anxious and wistful eyes, had been watching for her return. When the character of this service is considered, viz., the specially dangerous seas which during shoreward blowing gales of wind, break wildly on the bars of all rivers on so exposed a coast, and the long distance of twelve miles on a lee-shore which had to be traversed, it will be readily conceived that it would be difficult to speak in too high terms of the noble courage and hardihood of the brave fellows by whom it was performed."

On the other hand, the number of lives lost by shipwrecks on our coasts during the year 1870, was stated by the returns made to the Board of Trade to be 791; in spite of the best regulations and the most vigilant instruments of safety. A winter can hardly be expected to pass without the loss of many valuable lives on and around our shores, when we remember the circumstances under which many ships are lost, often during the dark hours of the night; such as by collision with each other, by being overwhelmed in mid-ocean, by being driven ashore amidst unapproachable rocks, or by striking on outlying banks on parts of the coast far distant from any Lifeboat or Rocket Apparatus Station.

There can, however, be no doubt, as the Committee had had to state on previous occasions, that a large, if not an alarming, number of the lives lost on our coast must be put down to the incapacity of masters and the unseaworthiness of the ships themselves; were these two great causes of mischief removed, it could not be doubted that a large diminution of the lives on an average lost would take place.

In addition to contributing to the rescue of 784 lives during the past year, the Institution had assisted in saving property of the value of many thousand pounds.

No less than twenty-one ships had been saved from destruction

by the life-boats, and in other cases the boats had been signalled off to vessels in distress, and had sometimes remained for hours together by them, thereby encouraging their crews to renewed efforts and skill to contend successfully with the tempest.

These life-boat services had of course varied much in their peculiarities; but the same fixed and determined gallantry had characterised them all—a noble contention with the elements for the succour of shipwrecked crews.

The committee wished again to call attention to the continued efforts of the Board of Trade in maintaining and extending the rocket apparatus on the coasts of the United Kingdom, which contributed every year, under the zealous management of the officers and men of the coastguard service, to the rescue of hundreds of persons from shipwreck at places where, for the most part, life-boats could not be made available.

The number of lives saved during the forty-seven years from the establishment of the Institution in 1824, to the end of the year 1870, either by its life-boats or special exertions for which it had granted rewards, was 19,864.

This large number, close upon twenty thousand persons, represented the prevention of an incalculable amount of suffering, not only to the persons immediately concerned, but to their families and friends. Neither should it be forgotten that those saved have been British seamen who, in pursuit of their perilous calling, contribute so largely to our national greatness and prosperity.

During the past year 11 silver medals, 14 votes of thanks inscribed on vellum, and £2,394 had been granted for saving the lives of 784 persons by life-boats, shore and fishing-boats, and other means, on the coasts and outlying banks of the United Kingdom.

These cases of rewards continued to receive the careful and anxious consideration of the committee.

The committee had received the prompt and cordial co-operation of the Lords Commissioners of the Admiralty, Captain G. O. Willes, R.N., C.B., and of the officers and men of the coastguard service, to whom the best thanks of the Institution were cordially rendered.

Since the formation of the society, it has expended on life-boat establishments, and other means for saving life from shipwreck, £269,000, and voted 90 gold and 822 silver medals for saving life, besides pecuniary rewards to the amount of £35,389.

The committee desired once more to tender their best thanks for the valuable co-operation afforded them by the local branch committees and honorary secretaries, which constitute so important a

portion of the machinery of the Institution for the supervision of its several life-boat establishments.

The total amount of receipts during the year 1870 had been £25,711 16*s.* 4*d.*; and of that sum £4280 4*s.* 3*d.* were special gifts to defray the cost of the following ten life-boats:—

	£	*s.*	*d.*
Aldborough—Mrs. Hounsfield	700	0	0
Chapel—Lady B.	500	0	0
Kessingland—"Bolton" Life-boat Fund	500	0	0
Montrose, No. 2.—"The Roman Govenor of Caer Hûn"	400	0	0
Morte Bay—Some Bristol Shipmasters in the African Trade (on Account)	120	0	0
Palling—"British Workman" Life-boat Fund ...	620	0	0
Salcombe—Richard Durant, Esq., (Additional) ...	160	0	0
Seaham—The Misses Carter	420	0	0
St. David's—The Earl of Dartmouth and his Tenantry (Additional)	360	4	0
Troon—Mrs. Sinclair	500	0	0

Legacies of various amounts had been bequeathed to the Institution, during the past twelve months.

During the past year £10,076 10*s.* 10*d.* were expended on additional life-boats, transporting-carriages, boat-houses, and necessary gear; £8,440 6*s.* 7*d.* on the expenses of repairs, painting, refitting, etc.; and £6,904 14*s.* 2*d.* in rewards for services to shipwrecked crews, coxswains' salaries, and quarterly practice of the life-boats' crews; making altogether, including liabilities amounting to £918 18*s* 3*d.* on life-boat stations in course of formation, and other expenses, a total of £28,747 10*s.* 4*d.*

The Institution succoured the shipwrecked sailor in time of peace or war, without reference to his nationality, and brought him safely to England's hospitable shores. In these warlike times, no society added a brighter page to the philanthropy of the age in which we live than the National Life-boat Institution, which appealed to all for sympathy and support.

The report having been moved, and unanimously adopted, resolutions in furtherance of the Institution were proposed and seconded by the Earl of Devon; Sir Robert Peel, Bart., M.P.; the Earl of Courtown; Admiral Sir George Sartorius, K.C.B.; the Earl Percy, M.P.; the Lord Garlies, M.P.; Sir John Maxwell, Bart.; Admiral Evans; Thomas Chapman, Esq., F.R.S., V.P; Rev. E Hewlett, M.A.; and Sir Edward Perrott, Bart., and the proceedings terminated.

SOCIETIES,

MEETINGS, ETC.

ROYAL INSTITUTION—On Friday, 17th February, a paper by Mr. James N. Douglass, engineer to the Trinity House, was read, on "The Wolf Rock Lighthouse." Mr. Douglass stated that the rock is situated about nine miles south-west of the Land's end, is 17 feet above low water, and is covered 2 feet at high water. The depth of water close to the rock is about 20 fathoms on all sides, except towards the south-east, where a shoal extends for a considerable distance, having only 4½ to 5 fathoms on it at low water, at a distance of a cable's length from the Wolf. At a distance of one mile from the rock the depth of water on this reef is about 14 fathoms, but in every other direction around the depth is not less than 34 fathoms. Situated as the Wolf Rock is, in deep water, and exposed to the full force of the Atlantic Ocean, a terrific sea falls upon it. In the year 1795, a beacon was erected on the rock consisting of a pole of wrought iron, sunk into the rock, and supported by six wrought-iron stays; the mast and stays being secured in the rock with lead. This beacon was soon swept away by the violence of the sea. During the years 1836 to 1840, the Trinity House erected a cast-iron beacon, 12 feet diameter at the base, and 22 feet high, filled with solid masonry, and surmounted by a mast and ball. This undertaking occupied five years, but the actual number of hours worked on the rock was only 302½, or 30¼ working days of ten hours each. This beacon cost £11,298. Three masts were carried away at different times by the violence of the sea. In 1860, the Trinity House resolved to undertake the erection of a lighthouse on the rock. The late Mr. James Walker furnished a design and estimate, and Mr. Douglass was appointed to carry out the work as resident engineer. On the preliminary survey of the rock, the latter gentleman had to be hauled off the rock through the surf on to the vessel in attendance, by a line fastened round his waist, the sea having got up while he was on the rock, and the increased swell preventing a boat approaching. This mode of embarking was frequently resorted to afterwards for getting the workmen off. In the autumn of 1861 arrangements were completed for commencing operations at the rock in the following spring. On the 17th March, the working party got upon the rock, and began to cut out the foundation pit. The insecurity of the foot-hold, and the constant breaking of the surf over it, rendered great

precaution necessary for the safety of the workmen. Heavy iron stanchions were sunk into the rock around the site for the foundation, and each man worked with a safety-rope lying near him, one end of which was attached to the nearest stanchion. An experienced man was always stationed on the summit as "crow," to look out for the sea, who would give warning of such waves as were likely to sweep the rock, when the men would hold on, head to the sea, while it washed over them; picks, hammers, and jumpers, some exceeding 20 lbs. in weight, were frequently found to have been washed away, when the waves had passed and were followed by a lull. The danger was further increased by frequent blastings of the rock with gunpowder; the only shelter that could be obtained for protection from the showers of falling pieces of rock with each blast, was by crowding all hands together under a temporary pent-house hastily formed around the iron beacon each time we landed. Three or four lucky individuals, more nimble than the rest, usually contrived to scramble through a man-hole into the upper part of the cone of the iron beacon.

The form of the tower is somewhat similar to Smeaton's celebrated Eddystone, but is of much larger dimensions; it differs but little from those of the Bishop, Smalls, and Hanois. The stepped outline of base was first adopted by Mr. Walker for the Menai Lighthouse in the year 1838. This stepping affords additional weight at the base of the tower, besides affording protection to the horizontal joints of the masonry; and the vertical face of each step has a tendency to check the upward flow of heavy seas on the tower. Its exact height is 116 feet $4\frac{3}{4}$ inches, its diameter at the base 41 feet 8 inches, and near the top, at the springing of the curve of the Cavetto under the lantern gallery, the diameter is 17 feet. For a height of 39 feet $4\frac{1}{2}$ inches from the base, the work is solid, with the exception of a space forming a tank for fresh water. At the level of the entrance door the walls are 7 feet $9\frac{1}{2}$ inches thick, whence they gradually decrease throughout the whole height of the shaft to 2 feet 3 inches at the thinnest part near the top.

Each face stone is dovetailed both vertically and horizontally. A raised dovetailed band 3 inches in height, is cut on the top bed and one end joint of each stone; a corresponding dovetailed recess is cut in the bottom bed and end joint of the adjoining stones, with just sufficient clearance for the raised band to enter it freely in setting; immediately the cement has hardened, the stone is so firmly secured to the adjoining stones as to be nearly equal in strength to solid granite. This system of dovetailing also affords great protection to both horizontal and vertical joints against the wash of the sea

when the work is first set. In addition to the security afforded by the dovetailing, each stone of the first and second courses was secured to the rock by strong bolts of yellow metal, and each face stone of the third to twentieth courses inclusive was secured to the course below in the same manner. For the inside stones galvanized steel bolts were used. All the holes for the bolts were bored in the workyard; and so accurately was this executed, that no instance occurred where the lower part of a hole was found to be out of position for properly inserting and wedging up the bolt at the rock.

The general internal arrangements of the tower are as follows. In the lower room, which is approached by a gun-metal ladder from the outside are stowed the ropes, life-buoys, and other appliances for landing at the rock: the second room is used for the stowage of coals, firewood, etc.; the third room, called the store room, is fitted with a crane for hoisting the coals, water, oil, provisions, etc., from the rock, and in it are stowed stores and provisions; in the fourth, or oil room, is stowed the oil for the light. The fifth, or living room, is fitted with a convenient cooking-range, etc.; the sixth, or bed room, is fitted with five bed-berths, etc. The seventh, or service room, is fitted with a stove for keeping up the temperature of the lantern during cold weather, and closets for storing everything necessary for the service of the light; the windows of this room are specially arranged for admitting air to the lantern, and for regulating the ventilation in all states of the weather. The supply of air is admitted by a valve at the upper part of the window so as to pass above the head of the light-keeper on duty, and upwards through an iron grating surrounding the lantern floor. The doors, windows, and storm-shutters are constructed of gun-metal.

The lantern and lighting apparatus are very fine examples of modern progress in lighthouse science. The lantern is so constructed as to intercept the minimum of light in its passage on to the sea. The lighting apparatus is dioptric of the first order, and the light exhibited consists of alternate flashes of red and white at half-minute intervals. With the able assistance of Dr. Tyndall and Mr. James Chance, a most brilliant effect is produced. The illuminating power of each beam sent from the apparatus is estimated at 31,500 English candles or units of light.

A fog-bell weighing five cwt. is fixed on the lantern gallery; it is struck by two hammers worked by machinery fixed in the pedestal of the illuminating apparatus, but independent of that for rotating the latter. For the purpose of giving the signal a distinctive character for the station, the machinery is arranged for striking

the bell three blows in quick succession, at intervals of fifteen seconds.

The total cost of the undertaking, including lantern, illuminating apparatus, cost of workyard, vessels, and all incidental expenses, may be taken at £62,726. This cost, considering the exceptional difficulties of the work, compares favourably with any similar work yet executed. It is a matter of great satisfaction that, notwithstanding the exceptional dangers of the undertaking, the whole of the work has been brought to a successful termination without loss of life or limb to any person employed. These operations, attended by numerous dangers and difficulties, continued for eight years. Mr. James N. Douglas, on being appointed as engineer to the Trinity House on the death of Mr. James Walker, was succeeded at the Wolf by his brother, Mr. William Douglass.

During a heavy storm in 1865, twenty-four stones, each weighing some tons, were carried away. A barrack schooner for the accommodation of the working party was moored three quarters of a mile from the rock as long as there was any chance of doing work, but if there were no immediate prospect of suitable weather the vessel went into Penzance. The landing boat was designed and constructed expressly for the work; she is built diagonally, of two thicknesses of elm plank, without timbers or floors, and is provided with a deck and landing mast forward. The deck and gunwale forward are covered with rough rope matting, for the purpose of affording a good foothold in jumping from or into the boat. Each workman is provided with a cork lifebelt, which he is compelled to wear while landing or embarking from the rock; and it was frequently necessary for the safety of the men, that they should wear these belts during the whole of the time that they were engaged upon the rock.

On the 19th July, 1869, the last stone of the tower was laid by Sir Frederick Arrow, the Deputy-master of the Trinity House. To this date there had been twenty-one landings and one hundred and ninety-four and a half hours of work on the rock, making a total for the eight working seasons of two hundred and sixty-six landings, and eight hundred and nine and a half hours, being only one hundred and one working days, of ten hours each, for the erection of the tower. The exhibition of the light was advertised for the 1st of January, 1870; but Christmas approached, and no opportunity had occurred for some time for communicating with the workmen in the tower, except by signal. On Christmas morning the opportunity so anxiously looked for arrived, when Messrs. James and William Douglass and three light-keepers proceeded in the

steam-tender and succeeded in effecting a landing; but before the effects of the light-keepers were fairly ashore, and an inspection could be made of the works in the tower, the sea had increased so much that the landing boat could no longer approach the rock It therefore became necessary, with a cold north-east wind blowing, to be hauled one at a time through the surf to the boat, which was preferable to the prospect of a lodging for an indefinite period in the lighthouse.

Since the completion of the tower, the heaviest seas that have been experienced were on the 11th September, 1869, during a violent gale from the westward, when large quantities of water went over the tower; but the residents state that although the shock was distinctly felt with each wave-stroke, scarcely any tremor was perceptible.

The light was exhibited on the 1st January, 1870, and has since been continued with regularity every night from sunset to sunrise.

GEOGRAPHICAL.—The seventh meeting of the present session was held on Monday evening, the 27th of February, Major-General Sir Henry C. Rawlinson, K.C.B., Vice-President, in the chair The paper read was, on "The Parallel Terraces, or Benches, of the River Valleys of British Columbia," by Mr. M. B. Begbie, Chief Justice of the Colony. The paper or report of Judge Begbie originated in a request made by the Rev. W. Robinson, through our Colonial Minister, to the Govenor of British Columbia, for exact information regarding these hitherto unexplained natural phenomena. According to the paper, the terraces existed for hundreds of miles along the sloping mountainous sides of the Frazer and Thompson river-valleys: how far they extended upwards, towards the Rocky Mountains, he was unable to say. They presented the appearance of a number of steps of large dimensions, ascending by very irregular gradations up the slopes, the opposite sides of the valleys exhibiting, whenever they have not been washed away or broken down by landslips, steps nearly exactly corresponding. Their formation showed that they were deposited from fresh water, being composed of fine loam at the surface, coarse gravel beneath, mixed with water-worn pebbles and sometimes larger blocks of stone. Although they correspond on the two sides of a valley in a given locality, this correspondence is very far from extending over the whole country; *i.e.* the upper terraces lie at a very much greater altitude (even as high as 1400 to 1900 feet) in some parts than in others, and the number of successive steps varies from one or two in some places to sixteen in others. Judge

Begbie was inclined to attribute their formation to the time when the whole interior basin of British Columbia was occupied by a vast chain of fresh-water lakes larger than that from Lake Superior to Lake Ontario, through the bottom of which the mountains were afterwards protruded, during the elevation of the whole country, by volcanic upheaval, leaving remnants of lacustrine deposit on their slopes in the shape of these terraces. Dr. Cheadle, who read the paper to the meeting, accompanied it with some observations of his own, made during his journey through the country with Lord Milton. He stated that the terraces did not reach so far as the upper waters of the Frazer, at 3500 feet, where he made observations, and he differed from Judge Begbie in his explanation of their origin, believing them to have been caused, during a very long period, by the successive damming up of narrow gorges of the rivers and the consequent spreading out of the upper waters into lakes; these processes going forward locally over the country would account for the different height and varied number of the benches in the various districts. The Rev. Mr. Robinson also spoke, stating that he believed the parallel roads of Glen Roy, in Scotland, to be corresponding formations, and suggesting that a rising of the waters to those altitudes might, after all, be the true explanation.

The eighth meeting was held on Monday evening, the 13th of March, Major-General Sir C. Henry Rawlinson, K.C.B., Vice-President, in the Chair.

The paper read was, on "Mr. Baines's Explorations of the Gold-Fields of South Africa," by Dr. R. J. Mann, and was founded on the voluminous journals, itineraries, astronomical observations, etc., sent by Mr. Thomas Baines, who had been employed, since the end of 1868, in making a general survey of the gold-yielding country lying between the Limpopo and Zambesi rivers. Leaving the Limpopo on its north-western bend, near the Makloutse and Shaspa rivers, he traversed, with his companions, the range of highlands separating the basins of the Zambesi and Limpopo, in a north-easterly direction, for 300 miles, negotiating with the powerful Matabele chiefs, fixing geographical positions, investigating the mineralogy, and sketching, with his well-known artistic skill, the scenery and people. His furthest point to the north was 17° 30′ south latitude, and in one part of his route he was within 120 miles of the Zambesi. On the route, the heads of a great number of streams were struck, flowing on the one side into the Zambesi, and on the other towards the Limpopo or Indian Ocean, the high land (averaging about 3,000 feet) forming the

watershed in this part of Africa. The country was healthy, but rather barren and arid, especially on the western slope of the watershed. The chief of the Matabele came to an amicable agreement regarding the working of the gold, which was found very widely distributed over the region, but only in quartz reefs, not in alluvial washing.

Many additional particulars regarding the country were given, after the reading of the paper, by Sir John Swinburne, who travelled over most of the same ground, and partly in company with Baines. He said the dry uplands were totally unfit for European settlement; but the well-watered northern and eastern slopes were fertile, and adapted for all kinds of tropical produce. The rich, well-wooded country on the eastern side, rugged with precipitous hills and deep valleys, was inhabited by a superior negro tribe, called *Mashonas*, totally distinct from the invading Matabele of the opposite (western) side of the uplands. Whilst the Matabele—a section of Caffres—follow no arts but those of war, and go nearly naked, the Mashonas are well clothed and practice the art of smelting and working iron in great perfection. He exhibited a specimen of gold, weighing twenty-seven ounces, extracted by his men from the quartz reefs.

Mr. Galton spoke of the great additions made by Mr. Baines, in this journey, to our typographical knowledge of Africa; and Mr. Dunlop stated that quartz had now been found in the country yielding eight to ten ounces of gold to the ton, and that the country was a suitable field for British enterprise.

THE ROYAL SOCIETY SOIREE.—Few of the Soireés of the President of the Royal Society are uninteresting to a sailor, whether of the Royal Navy or merchant marine; the models of ships and appliances for shipping purposes are always among the most observed of the various interesting objects exhibited, and often a motley group—when considered in relation to their varied pursuits—may be seen around the model of an ironclad or a patent method for lowering boats, listening with all attention to the explanation given by the exhibitor. Here a diplomatist with anxious and care-lined face, there a soldier, here a savant deeply versed in the mysteries of the vegetable kingdom, there a foreign decoré (we think all foreigners are *decorés*), here an English duke, there a Japanese Envoy, all striving to understand what is being told them, while a few sailors looking over their shoulders apparently take the whole thing in at a glance.

The Soireé of the 11th, which is the last but one of the venerable

president, Sir Edward Sabine, was not so rich a nautical display as we have seen before, the only two objects being Admiral Inglefield's steering apparatus and Commander Harvey's sea torpedo.

Admiral Inglefield's apparatus consists of an hydraulic cylinder, to be placed on the keel of the ship, with a piston and rod, very much after the manner of the ordinary steam cylinder. Into this the water will be admitted in the ship through a Kingston valve. To the piston rod of this cylinder is attached a plunger pump of smaller size, thus giving an accumulated force in the pump of say 100 times the pressure in the working cylinder. The water is conveyed from a chamber surrounding the pump by a pipe to an hydraulic ram attached to the end of the lever by a ratchet-brace, the ratchet wheel of which is keyed fast to the steam-shaft of the propeller. There is a valve-box attached to the ram cylinder which is actuated by a pin in the ratchet-lever to which is connected a rod working the valve, and thus causing a continuous action of the ram as long as the water pressure is permitted to act. When the screw is started into motion the ratchet-wheel runs away from the pawl, and leaves it behind in its revolutions, and the pawl is lifted out of the way and secured by a pin specially provided for the purpose. The joints in the hydraulic pipes are exceedingly well made, upon a patented principle. The two ends are merely placed together and secured by a nut, packed with an indiarubber ring, which pressed upon by the water packs the joint as close and as tight as in the case of the leather packing in an hydraulic ram gland. These joints are parts of the highest merit, as one of the great difficulties to be overcome in the application of the hydrostatic machine has been that of securing good connections in fitting the apparatus so low in the hull, and in making perfect the orifices where the pipes have to pass through bulkheads. The value of such power, always ready as soon as the Kingston valve is opened, for any work, steering, turning turrets or screw shafts, raising guns, or, in ships provided with the proper wells, raising the screw bodily, is not to be overrated. Admiral Inglefield and the manufacturers may be complimented upon this excellent piece of engineering.

Commander Harvey's torpedo we mentioned in our last number, in connection with a paper by Commander W. Dawson, R.N., read before the Royal United Service Institution. It may be briefly described as a box about four feet long, sharply pointed at both ends, about a foot wide and a foot and a half deep, the explosive material being of course within the box, fired by means of a plunger and detonating powder, the plunger being acted on by either of two projecting arms, one rising like the handle of a plough from the top,

the other projecting at right angles from one end. To prevent accidents and its being fired before the required moment, a small pin passes through the plunger and is there stopped; to the pin is attached a small line and to the torpedo is attached a cork buoy. The torpedo is slung from both ends, the pendants from one end being much shorter than the other, so that instead of being towed broadside on, it is towed at an angle, which, when going fast through the water, causes it to grow well out on the quarter. When intended for use the small swift steamer towing it steers for the object of attack, and on nearing it slackens speed, this causes the torpedo to sink, and then breaking the stop withdraws the safety pin and steaming ahead suddenly on one side of the ship attacked, the torpedo rises under her bottom, and one of the arms striking acts on the plunger, and the torpedo is fired. We should think some practice would be required to enable the person in command of the torpedo vessel to hit his object, and some amount of nerve when acting on an enemy's vessel.

We cannot omit to mention some very beautiful photographs of the Solar Eclipse, also Lord Lindsay's twelve-inch equatorial telescope with its photographic feed apparatus, by Browning.

At the Institution of Civil Engineers, on the 14th of March, a paper was read on "Phonic Coast Fog Signals," by Mr. A. Beazley, M. Inst. C.E. The author commenced by referring to the small amount of attention this important subject had hitherto received, and to the absence of systematic research and experiment. He then observed that it was by some supposed that great power and long range of sound were essential to fog-signals, inasmuch as it was said fogs usually occurred in comparatively calm weather. This he shewed was not the case so far as regards the British coasts, instances being given of the extensive prevalence of fogs at different parts of the coast, when the strongest winds were from seaward. But even where fogs were not usually attended by high winds, the necessity of power and range in fog-signals was in no way diminished; for a heavy snow-storm, or thick driving sleet and rain, which often accompanied a gale of wind, were quite as blinding and bewildering as the densest fog. Reference was made to the memorial addressed in 1863, by a Committee of the British Association to the President of the Board of Trade, with a view to induce him to institute a connected series of experiments to the effect of fog upon various sounds; and it was shown that the laws which governed the action of fogs in deadening sound were at present so imperfectly understood, that such a thorough and scientific

enquiry was much to be desired, and was, in fact, essential to any real addition to the knowledge of the subject; without which, all investigation of isolated cases were little better than a vague groping in the dark. It was also pointed out that experiments during clear weather could not be accepted as affording satisfactory evidence of the value of any signal during fog. A suggestion had been made whether water might not be employed as a medium for the transmission of fog-signals. The experiments of M. Colladon on the Lake of Geneva in 1826 were referred to, as well as the recommendations made in 1851 by Mr. Babbage to the United States lighthouse board, and Professor Hennessy's views on the same subject.

It was stated that the instruments in use for fog-signals were gongs, bells, guns, whistles, and trumpets—the two latter sounded either by steam or by condensed air, and a detailed description was given of these several appliances, and of the experiments that had been tried to ascertain their efficacy.

In conclusion it was remarked that upon a review of the various fog-signals which had been mentioned, it was found that the whistle and the trumpet stood out prominently as regarded power and manageableness. Guns, besides their heavy working expenses, had the disadvantage of requiring a longer interval between the signals, and of entailing continuous work upon the attendant. It appeared, therefore, that it was to the improvement and the augmentation of power of the two former, that a more efficient instrument must at present be chiefly looked for. Whatever might be the fog-signal adopted in practice, power of sound and certainty of action were indispensable conditions. Better, it had been said, no signal at all, than one that could not be relied upon; and, undoubtedly, if the mariner were led to expect a signal at a certain place, and at a sufficient range to ensure time to act upon its warning, it ought to be so heard with unfailing certainty. Among existing signals there were some which, in ordinary fog and moderate weather, would fulfil these requirements; but it was doubtful how far they would act to windward against a heavy gale. The howling of the wind, the groaning and creaking of the hull and spars, the shock and roar and thunder of the sea, the drenching, blinding spray, the fierce blast, the thick mist—these were the antagonists against which the fog-signal would have to try its powers; and powerful indeed must be its voice if it afforded in time a friendly warning.

There was another point with respect to fog-signals, in connection with a lighthouse, which ought not to be overlooked; namely, the importance of making the character of the sounds, and

their duration and intervals, correspond with the character of the light. The fixed light might be denoted by continuous sound, or better by a quick succession of sounds; the revolving and the flashing light by corresponding blasts; and coloured beams alternately with white light, by a lower and a higher note alternating in a similar manner.

One difficulty in the way of employing at rock lighthouses any fog-signal but a bell, or such other instrument as could be sounded by the application of simple clockwork, was the unsuitableness of such buildings for the reception and working of a steam or caloric engine, and the severe labour which would be entailed upon the keepers by the use of powerful machinery worked by hand. But the author still entertained the opinion, which he formed sixteen years ago, that the vast dynamical power afforded by the rise and fall of the tide would yet be utilized and applied to the compression of air for the purposes of fog-signals at such stations.

INSTITUTION OF NAVAL ARCHITECTS.—In our next number we hope to be enabled to furnish our readers with the resumés of the papers announced to be read at the meetings of this institution on the 30th and 31st March and the 1st April. The programme is most attractive to those interested in Naval Architecture, and we are glad to recognise in the following list several well-known names as authors of papers.

"*The Improved Compound Engines, as fitted on board H.M.S. Briton.*" By G. B. RENNIE, Esq., M. Inst. C.E., Member.

"*Steel as applied to Shipbuilding.*" By J. B. HOWELL, Esq., Associate.

"*A New Method of Testing Metals.*" By LEWIS OLRICK, Esq.

"*A Plan for Conveying Railway Trains across the Straits of Dover.*" By EVAN LEIGH, Esq., Engineer, Associate.

"*Certain Strains to which Ships are subject.*" By E. J. REED, Esq., C.B., Member and Vice-President.

"*The Relative Influence of Breadth of Beam and Height of Freeboard, in Lengthening out the Curves of Stability.*" By NATHANIEL BARNABY, Esq., President of the Council of Construction to the Admiralty, Member of Council.

"*Calculations of the Stability of Ships, and some points of interest connected therewith.*" By WILLIAM HENRY WHITE, Esq., Associate, and WILLIAM JOHN, Esq., Associate.

"*The Efficiency of Jet Propellers.*" By M. B. BRIN, Director of Naval Construction, Ministry of Marine, Florence.

"*A New Method of Mounting, Lowering, Raising, and Turning Turrets in Iron-clad Ships.*" By Rear-Admiral INGLEFIELD, C.B., F.R.S.

"*The Measurement of Yachts.*" By HENRY LIGGINS, Esq., Associate.

"*The Measurement of Yachts, and Allowance of Time in Competitive Sailing.*" By CHARLES H. HASWELL, Esq., Civil and Marine Engineer, Associate.

"*Completing the Launching of Ships which have stopped on their Launching Slips.*" By WILLIAM BRAHAM ROBINSON, Esq., Master Shipwright and Engineer, H.M. Dockyard, Portsmouth, Member of Council.

"*The Position of the Masts in Merchant Ships.*" By WILLIAM SYMINGTON, Esq., Associate.

"*The Working Expenses of Steamers of Small Size.*" By A. F. YARROW, Esq.

"*The Commercial Economy and Performance of several Types of Merchant Steamers.*" By WALTER C. BERGIUS, Esq.

"*A Vessel in Motion and what becomes of the Water she Disturbs.*" By HENRY RANSFORD, Esq., Associate.

"*The Depolarization of Iron Ships.*" By CHARLES F. HENWOOD, Esq., Associate.

"*Some Particulars of the Iron Sailing Ship, 'Richard Cobden,'*" By JOHN GRANTHAM, Esq., Member of Council.

"*The Correction of Compasses in Iron Ships.*" By THOMAS BRASSEY, Esq., M.P., Associate.

"*Sheathing Iron Ships.*" By HOWARD NINNIS, Esq., Associate.

"*Further Experiences of the Applicability of Zinc for Sheathing Iron Ships.*" By C. F. T. YOUNG, Esq., Associate.

"*The Steering of Ships.*" By EVAN LEIGH, Esq., Associate.

"*A Pneumatic Sounding Machine.*" By WALTER C. BERGIUS, Esq.

IRISH FISHERIES.—The great success which has attended the present fleet of 200 vessels, representing a money value at Kinsale of upwards of £60,000, is inducing a great many people interested in the east coast of England fisheries to turn their attention to Ireland, at a period of the year when little employment exists on their own coasts, and as large numbers of boats are preparing to engage in the Kinsale fisheries, it is fully anticipated that the fishing fleet for the ensuing season will number upwards of 300 boats.—*Food Journal.*

MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
17	Cape of Good Hope—Roman Rock Lighthouse.	Alteration of colour.
18	Japan — Simoda Harbour — Rock Island.	Establishment of a light, and discontinuance of temporary light.
19	Java Sea—Sourabaya Strait.	Establishment of a light-vessel at north entrance.
20	North Sea—Texel Entrance—Falga Light.	Alteration in colour of part.
	England—East Coast—Filey Bay—Filey Brig Buoy.	Intended Alteration.
21	Red Sea—Perim Island.	Shoal off north-west side.
22	North Sea—Elbe River.	Replacement of buoys and lights.
23	Sweden — Kattegat, Sound, Baltic, and Gulf of Bothnia.	Proposed establishment of lights.
24	South Australia—St. Vincent Gulf —Cape Jervis.	Establishment of a light.

(All bearings are Magnetic.)

17.—*Cape of Good Hope—Roman Rock Lighthouse* has been painted in broad horizontal bands of *red and white*, to distinguish it when seen against the background of sand.

18.—*Japan—Simoda Harbour—Rock Island.*—A *fixed* light of the first order, showing *white* to seaward, but *red* inshore between the bearings N.W. and N. ¾ E. from the lighthouse, 164 feet above the sea and visible 20 miles, is now exhibited from a new lighthouse in lat. 34° 34′ 20″ N., long. 138° 57′ 10″ E., and the temporary light has been discontinued. The red portion of the light covers all the dangers between Rock Island and the shore, and its eastern edge leads into Simoda Harbour.

19.—*Java Sea—Sourabaya Strait.*—A light vessel has been placed in 5 fathoms water off the north entrance 5¾ miles N.E. by E. (easterly) from Panka Point, or in lat. 6° 52′ S., long. 112° 38½′ E. The light is a *fixed white* light of the sixth order, 28 feet above the sea, and should be seen 10 miles. In case the light cannot be exhibited, a lantern will be hoisted and a gong sounded during the night.

20.—*North Sea—Texel Entrance—Falga Light.*—The light is now *green* when seen from between the bearings N. by E. and E. by S., and *red* (as before) from the other points of the compass. In entering the Sculpe Gat, keep the lights at Kykduin and Dirkoomduin in line as long as the Falga light appears green, but as soon as it changes to red bring the Kykduin light gradually open of the other.

England—East Coast—Filey Bay.—In the course of the summer a ***black bell*** buoy, ***with staff and globe***, will be placed off the extremity of Filey Brig reef, in the position now occupied by the Filey Brig buoy.

21.—*Red Sea—Perim Island.*—Shoal water extends from the island on the north-west side, which should not be approached within half a mile.

22.—*North Sea—Elbe River.*—The lights and buoys that had been removed in consequence of the late war, have been, or will be, re-established.

23.—*Sweden—Kattegat—Skripvereklippen.*—An alternating *red* and *white* light, interrupted by eclipses, will be exhibited, lat. 57° 6′ 20″ N., long. 12° 13′ 30″ E.

Sweden—Sound—Hveen Island.—A *flashing white* light, with short eclipses, will be exhibited from the north-west point of this island, in lat. 55° 55′ 10″ N., long. 12° 40′ 30″ E.

Sweden—Bothnia Gulf—Skags Point.—A light will be exhibited from a rock off this point, in lat. 63° 11′ 50″ N., long. 19° 2′ 40″ E.

The above lights are intended to be exhibited in the autumn.

Sweden—Baltic—Oland Island—Kappel Point.—A *flashing* light will be exhibited on this point, lat. 56° 49′ 20″ N., long. 16° 50′ 40″ E.

Sweden—Bothnia Gulf—Rodkaller Rock.—A light will be exhibited on this rock, in lat. 65° 19′ 20″ N., long. 22° 23′ 10″ E.

The above lights are intended to be exhibited next year. Further notice will be given respecting them.

Sweden—Bothnia Gulf—Holmö Gadd Lighthouse.—Guns have been furnished to this lighthouse, to answer fog signals. Two guns in quick succession will be fired in answer to any vessel firing a gun.

24.—*South Australia—St. Vincent Gulf—Cape Jervis.*—A ***fixed white*** light, visible between the bearings N.N.E. ¼ E. and S. ¼ E. from a distance of 13 miles, will be exhibited on or about the 1st May, 1871, in lat. 35° 37′ S., long. 138° 7′ 30″ E.

A shoal, with 11 feet water on it, is reported in the Gulf of Siam, lying due north 5 or 6 miles from Kusrovie Rocks.

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, IN MARCH, 1871.

No.	Scale.		s.	d.
998	m = 0·23	Gulf of Siam: Pulo Kapas to Cape Patani	2	0
89	m = 2·3	Tagus River entrance, with views, and Lisbon Harbour	2	6
2504	m = 1·95	Australia: Portland Bay	1	6
1905	m = 2·0	,, Great Sandy Strait, southern entrance	1	6

x 2

HYDROGRAPHIC.

[The following particulars are extracted from information published by the Admiralty.]

ST. LAWRENCE—CANSO HARBOUR.—Information has been received that in order to facilitate the navigation into Canso harbour by the northern entrance, two beacons thirty feet high, with triangular heads painted white, are being erected on the southern shore of Canso harbour.

The southern beacon will be on Lanigans hill, with the Roman Catholic church bearing N.W. by W. westerly.

The northern beacon will be on the eastern side of Grave islet at high-water mark, and will bear N. ½ E. from the beacon on Lanigans hill.

Directions.—To enter Canso harbour by the north-west entrance, being outside the Net rocks, bring the Roman Catholic church-steeple at Canso to bear S. ½ W., when it will be seen over Cutler island, midway between the house on the island and its western end.

Steer S. ½ W. for this mark, and it will lead nearly midway between the Bald and Whitman rocks, and when the red clay cliff of Glasgow head to the southward of Canso is seen through the channel between Cutler and Piscatiqui islands bearing S. by E. ½ E., steer for it, keeping in mid-channel until Grave islet beacon comes on with Lanigans beacon bearing S. ½ W.; then run with these beacons in line, and when Cranberry lighthouse appears in one with Fort point on Grassy island, trail to the westward into the harbour.

GUT OF CANSO.—The red buoy marking the Cerberus rock at the southern entrance to the Gut of Canso, is moored in fifteen fathoms about half a cable S,S.W. of the rock.

WEST INDIES—CURACOA ISLAND.—The following remarks are published for the information of navigators bound to Santa Ana harbour, Curacoa island, and not acquainted with the currents in its neighbourhood.

It is customary for vessels after passing point Canon, the east point of Curaçoa, and unable to reach the port in daylight, to lie-to with the light on little Curacoa bearing east, standing off and on in order to be in a favourable position for entering the port on the following morning; this light lies S.E. ¾ E. distant five miles from Canon point.

The prevailing current when strong sets directly towards Canon point, dividing north and south in the direction of the land, but on the south coast of the island one and a half miles to the westward of the point, at a place known as Hala Canoa, an eddy current is formed setting back E.N.E. along the land to Canon point; this is consequently a dangerous locality for vessels, the coast being low and rocky, with a lagoon inside, and therefore difficult to be seen at night.

Within the last ten years no less than six vessels have got on shore within two cables of the same place, besides others that have been wrecked lower down the coast.

Vessels from the northward should, after passing little Curacoa, run to the westward until abreast of Santa Barbara or Tafelberg, and heave-to with their heads to the south-east, when the danger alluded to will be avoided.

The regulations with regard to vessels not entering the harbour of Santa Ana after sunset are rigidly enforced.

NEWFOUNDLAND.—NORTH-EAST COAST.—The following remarks on the north-east coast of Newfoundland, in the neighbourhood of Fogo island, have been compiled from the surveys and remarks of Staff-Commander J. H. Kerr, R.N., Admiralty Surveyor.

Fogo Harbour lies east of a bold rocky peninsula which forms the north-west extremity of Fogo island; the intervening coast is broken and rocky, with dangers extending off a distance of one cable, and lying in the fairway to the eastern entrance of the harbour.

On the south of the peninsula is Brimstone head, a high perpendicular bluff.

There are two principal channels into the harbour, the eastern having 11 feet, and the western 24 feet, and secure anchorage may be found, in 3 to 7 fathoms, mud.

The Eastern Entrance is between Rags and Lighthouse island; northward to the former, at a cable distance, is the Rags rock, and off the north point of Lighthouse island is Simms rock; both are under water, but break in a moderate sea. Nanny rock, with 4 fathoms over it, lies 2 cables north-east of Barnes island; it breaks in a heavy sea.

The Western Entrance is between Boatswain island and the cliffs of Fogo head; it is but half a cable wide, and narrowed by a rock which extends half-way across from Boatswain island, while a rock with 5 fathoms lies $1\frac{1}{2}$ cables west of the West entrance, and half a cable from the shore. Fogo is a town of considerable importance, being the depôt for the surrounding fishing districts.

Current.—A current running from the north-west splits about 2 miles off Fogo head, the main branch sets along the north shore of Fogo island, and amongst the rocks and islands around it, from half to 1½ knots; it is much influenced by the wind, being accelerated by northerly and retarded by southerly winds, while before easterly gales it sometimes runs to the north-west. This current, after passing Round head, takes the direction of the coast, it is influenced by the tidal stream, the ebb accelerating and the flood retarding it, but only occasionally at spring tides stopping its southerly course entirely.

South Coast of Fogo Island.—*The Coast* from cape Fogo to Seldom-come-by harbour, runs W. ½ N. 7 miles; it is bold and rocky, and indended by three coves, namely, Cape, Kippin, and Wild coves; they afford no shelter.

Seldom-come-by Harbour is the first safe anchorage north of Greens pond, from which it is distant 50 miles; the entrance is three-quarters of a mile wide. Shoal water extends 1½ cables off Burnt point, but with this exception there are no dangers. Having advanced up the bay so as to have the inner harbour on the west side open, anchorage will be found in 6 fathoms, mud, over a space a quarter of a mile in diameter. The inner harbour is a cable wide by 3 cables long, with a depth of 12 feet. There is a considerable village around the shores of the harbour and bay, but no supplies can be obtained except water.

Stag-Harbour Tickle.—The channel southward of Fogo island, between it and the main land, is divided by the Indian islands and their adjacent islets; the northern channel between these islands and Fogo, in Stag-harbour Tickle, the southern Sir Charles Hamilton sound. The former, though narrow and intricate, is preferred by coasters.

Indian Island Harbour lies between the east and west Indian islands; its entrance is 2½ miles N.W. ½ W. of little Grandfather island; the harbour is a mile long, S.E. by E. and N.W. by W. and a quarter of a mile wide; summer anchorage will be found for small vessels in 2 fathoms, mud.

Rocky Bay.—The entrance to Rocky bay is six miles wide between Rocky point and Grass islands, but is broken into four channels by White, Green, and Noggin islands; between Green and Noggin islands the passage is foul, with 2½ fathoms over a bottom strewed with boulders. Between Noggin and Grass islands, and also between Green and White islands, the channels are clear.

Safe anchorage will be found in all parts of the bay on ground generally of mud.

Tides.—The ebb at Clark point runs two knots at springs with a very weak flood for about three hours; at neaps there is no flood stream.

East Coast—Catalina Harbour.—*Lowe Rock.*—A rock with twelve feet has been found on the southern side of Catalina harbour, lying a little over a cable, N.N.W. ½ W., from the northern point of S.E. cove, with Goodland point bearing N.E.

GENERAL.

Admiralty Changes. — It is now no news to state that Mr. Childers is no longer First Lord of the Admiralty, and that Mr. Goschen has succeeded him in that office; that Mr. Baxter has ceased to be Financial Secretary of the same Board, and that Mr. G. Shaw Lefevre has taken his place.

Much stress has been laid by the public journals on the incongruity of the first named appointment, and we think without reason. With regard to experience and adaptability, we cannot see that Mr. Goschen differs much from his predecessors; neither the Duke of Somerset, nor Sir John Pakington had any experience to back them when they took office, and yet there is not a word against either having been efficient men. It may also be said that the only one who for many years was qualified by service to guide the Naval state was the late Duke of Northumberland, and yet we do not remember that his administration of the department was exceptionally good. It may appear rather ridiculous to say so, but it is not supposed that a First Lord of the Admiralty should know anything about the sea; the late First Lord had some ideas on the subject, but on the principle that a little knowledge is a dangerous thing, it is thought by some that he would have been better fitted for his post had he not thought and believed he knew something of the business he was to preside over, and centred all the responsibility on himself. But all First Lords on their appointment seem doomed to be objects for the wit of the period. Sir J. Pakington was a very good county magistrate, but what knew he about ships? and yet, from the course that gentleman pursued and had marked out, he won the admiration and gratitude of all who had the welfare of the service at heart; and had he not been removed, there is no doubt he would have reformed and regenerated the whole Navy, for while consulting Naval men on Naval affairs, he showed

rare discrimination in separating personal interests from the interests of the service at large, and had strength of mind and stability of purpose to go steadily forward—yet he was *only* a good county magistrate. Again, the Duke of Somerset, who, if we remember rightly, Mr. Punch condescended to teach seamanship in the basins of the Trafalgar Square fountains, evinced no want of knowledge of business; and it is generally allowed his appointments, promotions, etc., were fair, and considering the transitionary state of the Navy, his dockyard and building arrangements were good in general.

Mr. Childers, if he did not undergo so much of the "baptism of fire" as his predecessors, has not been spared in connection with his taking command of the Channel fleet, but his works have yet to be proved; he has flown at the sun, and dropped when only halfway. For ourselves we think that he did not attempt too much, but that he was too sudden. Few will assert that reforms—and great ones—were not needed at Somerset House, and few will assert that reforms were not needed in the Navy; but it was the suddenness, and the personal hardship, which seemed in some cases very much like injustice, that brought odium on the movement: had it been extended over us as many years as it has months both suddenness and injustice would have been avoided. Nevertheless, we do not forget that there are many officers, worn out in the service of their country, now comfortably retired, who will remember Mr. Childers with gratitude for his retirement scheme; although on the other hand many feel that in being cut off from all hope of advancement or preferment in the prime of life, and from no fault of their own—in spite of regulations already provided which made the scheme virtually retrospective—they were treated harshly and unjustly.

Mr. Goschen has become First Lord at a period of no little difficulty and embarrassment, and it will need wisdom, firmness, perseverance, and discretion to take up the tangled skein of Admiralty administration as left by Mr. Childers; it is a great work, and when it is accomplished the Navy itself will require much attention. Much is expected and much is needed, and young and inexperienced as the new First Lord may be, and although he may be "at sea in a bowl," we hope he will find some good men and true to take him in tow, keeping his own paddles going at the same time. His clear statement and apparent mastery of details when bringing the Navy Estimates before the House gives fair promise of a successful administration on his part of the Office of Lord High Admiral.

MARINE SURVEYS AND SURVEYORS.—It was with no little satisfaction we observed that Sir James Elphinstone had called the attention of the House of Commons to the imperfect harbour accommodation on the coasts of India, to the insufficiency of lights, and the apparent absence of an active and effective marine department; and although we read that after a few observations the matter then dropped, we cannot but hope, considering the great importance of the subject, that Sir James's remarks may cause the authorities to look into the matter.

When the East India Company resigned the care of the coasts which they had elaborately surveyed, to the Imperial Government, it was no reason why there was to be an end to all examination or re-examination to keep the charts correct; but although we have had surveying vessels on almost all other parts of the world, we do not remember that one has ever been detailed for the coasts of our great Indian possessions, and it is remarkable how few new lights have been established on those coasts during the last twenty years, as compared with those set up in other parts of the world.

It is with no political animus that we remark on the declension of that important part of our navy, the Surveying Service. A reference to the Navy List of the present day and that of a few years ago as regards the number of officers and men employed in that branch of the service, shows a lamentable falling off. It cannot be reasoned that like Alexander, who had to look for "other worlds to conquer," that we have no more coasts to survey, even our own coasts require constant re-examination, and it is difficult to keep pace with the continued alterations that are going on, and the same alterations are taking place in other parts of the world that are being continually visited by our ships. Many places accurately surveyed not ten years ago now require re-examination, how much more then places that were surveyed thirty to fifty years ago.

The expense of surveying ships may be urged as an excuse for not employing them; but are not a certain number of men voted for the Navy? and would a part of that number be less valuable to the Navy in case of war from their being detached for such service? We emphatically say they would not, and we would be almost prepared to say they would increase in value from the very nature of the work they had been employed on. At the commencement of the Russian War the demand for surveyors was very great, the Baltic and Black Sea fleets had their quota allotted to them, and Sevastopol, Kinburn, Sweaborg, and Bomarsund told of their usefulness. Were we now unfortunately to go to war—how many

actual surveyors could the Admiralty lay their hands on to meet the want which would undoubtedly exist, probably in a greater degree? We believe they could almost be counted on one's fingers. Surveyors (or what they would be more fitly termed, Nautical Engineers), are not heaven-born, nor can they be made in a day, and a sudden want of them would be severely felt; yet instead of fostering a corps whose usefulness is undoubted, and whose necessity in war as well as peace is unquestioned, we see year by year the scientific vote (or the part of it applicable for surveying) gradually diminishing as though it were intended to let it die out. We do not scruple to characterise such a policy on the part of any administration as short-sighted, ill-timed, and parsimonious.

The Royal Observatory at Greenwich may be considered cosmopolitan rather than national; still less can it be considered as appertaining to the Royal Naval service rather than to the mercantile marine; both are equally dependent on it, both are equally interested in its welfare. It is also an institution of which we are nationally proud, for of no other observatory in the world can it be said that a continuous observation of the heavenly bodies since the year 1676 has been steadily recorded. So quietly and unostentatiously has this great work been going on, that beyond seeing old Flamstead House as one passes up and down the river, or, as a navigator, rating the chronometer by the time ball, or referring to that great result of the observations, the Nautical Almanac, few care to inquire into the inner life of that somewhat mysterious building, but rather imagine that the nation's employeès therein lead a quiet life, a happy medium between literary ease and scientific investigation. It will however be a matter of surprise to many to hear, that so far from this being the case, there are scarcely any harder worked men under the Crown, than those employed at the Observatory, and moreover that the salaries of some of the staff, scientific and educated men, would not stand comparison with that of a butler or a well-to-do mechanic. To foreigners this state of things is inexplicable, it would seem as though science were at a discount in England, and when we consider the vast sums expended on less worthy objects, we may well ask the question, why should these things be? We had hoped that this national reproach was about to cease, as an intimation appeared in the Navy estimates of a proposed improvement in the salaries, but we hear that at the last moment, their Lordships of the Treasury have "not approved." We hope this measure of justice is only deferred, and that before the Navy Estimates are brought forward, their Lordships will take

the trouble of comparing the salaries of these gentlemen with some of their own third-class clerks, of whom the greatest attainments required, may be, to copy a letter correctly.

We may mention incidentally, that the son of Mr. Glaisher, F.R.S., superintendent of the magnetical and meteorological department of the Royal Observatory, Mr. James Whitbread Lee Glaisher, has succeeded in attaining the honourable position of second wrangler in the Tripos Examination at Cambridge this year.

H. M. S. Glatton.—On the 8th of March, the first of another type of war ship was floated out of the dock at Chatham. The *Glatton* was designed for coast defence and is the first of the *Monitor* class built in this country, although widely different in size and strength from any hitherto built. Her dimensions are as follows:—length, 263½ft.; length between perpendiculars, 245ft.; extreme breadth, 54ft.; draught of water, 19ft,; tonnage, 2700; horse power (nominal) 500. The *Glatton* is armour-plated along her whole length with 12in. iron above the water line and 10in. below, the whole being backed with 20 inches thickness of teak, within which are the skin platings 1in. thick, laid on the usual iron frames 10in. deep and 2ft. apart. The height of the deck above the water, is only 3ft. but this freeboard is increased to 9½ft. immediately around the turret by a fort or chamber intended to protect the lower part of the moveable turret within from being injured or jammed by shot or shell. This breastwork is of 12in. iron with 15in. wood backing. The turret itself rises 7ft. above the breastwork and is 31ft. in external diameter, it is built of 15in. wood, covered with 12in. plates, which increases to 14in. immediately around the ports, also an iron skin lining of ⅛in. iron. The deck is of 8in. iron and 6in. of oak. The armament of the *Glatton* will consist of two 25-ton 600 pounders, and the turret in which they are placed will be worked by rack and pinion gear. The propelling power is by double screws of four blades, and she will on ordinary occasions carry 250 tons of coal, but this stowage accommodation can be increased to nearly double in case of necessity. The speed she is calculated to attain is between nine and ten knots.

The Loss of the Captain,—A letter to the *Times* by Admiral the Hon. H. J. Rous on the above subject must not be passed over in silence, not merely from the fact of its being from the pen of an Admiral and an authority, but, because the loss of the ship, is considered from a seaman's point of view and not a builder's. We are

not disposed to criticise the gallant Admiral's statements, for we think the question has received enough dry discussion, but we quote the letter for the benefit of our friends abroad, because of the writer's straightforward way of looking at the subject, and his very vigorous expression of opinion, which in connection with this particular subject are somewhat refreshing.

Speaking of the unfortunate ship, he says, "She was notoriously overmasted—twenty-two inches deeper in the water than the estimated calculation; consequently, she required delicate handling and fine seamanship. During a dirty looking night, with a falling barometer, the Admiral, instead of ordering his squadron to send down topgallant yards, to treble reef the topsails, and to run under the topsail and foresail to keep the ship under command, allowed the officers to carry sail as they pleased. The *Captain* was under double reefed topsails, with the topsail yards braced up beyond the angle of inference with the lower yards (the grossest fault a seaman can commit). A preliminary squall catches the ship at eleven o'clock, but the officer of the watch, instead of rounding in his topsail yards, to secure the spars, to facilitate their fall on the caps when they let go the halyards, appeared to be helpless. When the fatal squall struck her at twelve o'clock, instead of the topsail sheets and halyards being clear, and the weather clewlines well manned to clew the yards down if they hung aloft, which was certain to be the case, because they were jammed against the lee rigging, not one single precaution was taken. The watch on deck bolted below without being relieved, and the ship, having very little way on her owing to the baffling winds and probably bad steerage, had lost that power of resistance which a ship commands when she is running fast, thereby having hold of the water. This accounts for her better behaviour on the 29th May. As the topsail yards were nearly fore and aft, and nobody wise enough to let go a lee fore or main topsail sheet, it is not to be wondered at that she capsized. It generally happens that when a terrible catastrophe occurs some good arises in the shape of warning to inexperienced officers. In this instance evil begets evil.

"A Court-martial is of course ordered to try the survivors, and to ascertain whether the *Captain* was lost by negligence or other default. The Court sat three days investigating the merits of the build of the ship, which was not within their jurisdiction. They were summoned to decide—not how the ship was built, but how the ship was lost. Only three questions were necessary:—

"1. Why were no preparations made to shorten sail to meet the threatening squall?

"2. Why were men not stationed by the lee topsail sheets and halyards, according to the custom of every ship of war in respectable discipline, which is, to station men by the sheets and halyards of the first sail to be reduced, even in the finest weather?

"3. Why were the watch on deck allowed to go below before they were relieved, and the deck deserted in the face of the enemy?

"The verdict was—'Lost by the strength of the wind and the heave of the sea.' *A truism.* It would have been more consonant to common sense—'Lost by the officer of the watch not knowing how to shorten sail or to keep his men on deck.' The truth is that the boiler has emasculated seamanship. No man can serve two masters—he will hold to the tea-kettle and despise the canvas. You can no more rear a seaman in a steamer than on the Bridgewater Canal, and in ten years' time the British *seaman* will be a rare bird among the sailors in the Royal Navy."

Life Saving Collar.—A patent has been taken out for a small but very useful invention, not yet made known to the public; and when we state that it is simple in construction, useful, ornamental, compact, lasting, and inexpensive, some curiosity may be felt as to the nature of an article that combines so many qualities. We know not under what Greek derived name it may—like Ozokerit—be dandled before the public to excite speculation before the real thing is made known, but we will simply call it a "Life Collar," as at once giving a significance, as the life belt does, of itself. It is simply a collar, intended to support a person in the water to prevent him or her being drowned. It is made of a patented mixture of India-rubber and paraffin and is capable of being inflated by the breath through a small flexible tube attached to it. The collar is slipped over the head in a flexible state, and when required for use is inflated, and by the simple contrivance of a small moveable piece of tubing being slipped over the valve, the air is prevented from escaping; the more the collar is expanded the tighter it fits round the neck so that it is impossible it can shift its positiou or come off. Whether a person can swim or not it will be useful, but to those that cannot, we believe it will be indispensable; to those that venture on the ice, not only will it be a safeguard against being drowned but also one against cold, forming a comfortable boa, which the keenest wind cannot penetrate. It is so far ornamental, that with a silk or cotton case it can be worn as a necktie with a ring slipped over it. As to compactness it will lie perfectly flat in a common envelope, and a box two feet square would contain enough for a crew of one of our

largest men of war. Of its lasting properties, the admixture of paraffin prevents the india-rubber perishing as it usually does, and lastly, the cost—irrespective of the covering for ornament, which may be considered a superfluity—will be two or three shillings. We predict for this little article an extensive sale.

SEAMEN'S PRAYERS.—We have received from Commander W. Dawson, R.N., some pocket cards of Seamen's prayers, published by Messrs. Griffin, of Portsea, under the sanction of several Naval Chaplains, with a view to promote habits of private prayer on ship-board, and with an appropriate introduction by the Bishop of Dover. Naval officers have bought 23,000 copies, at the rate of half-a-crown per hundred, during the last four months, and circulated them amongst men-of-war's men with such good effect, as to lead to a special edition for the "Merchant Navy," which has just been issued. Already a shipowner has ordered 2000 copies, and a merchant captain has given two guineas for its free circulation. It is hoped that other shipowners and sea officers, and the friends of the mercantile marine generally, may furnish copies to merchant seamen.*

We cannot sufficiently praise Commander Dawson's earnest and well-directed efforts to improve the social condition of our merchant seamen. To all thinking minds the low *morale* and the degenerated *physique* of the majority of our mercantile sailors is distressing in the extreme, and it is with peculiar satisfaction that we hear manly voices lifted up against the abuses which exist, and practical remedies suggested. From our heart we wish them God speed, and will use whatever power we possess to aid such praiseworthy endeavours.

SHIP CHANNEL BETWEEN INDIA AND CEYLON.—On March 28th, a crowded meeting of the East India Association was held at the Westminster Palace Hotel, when Sir James Elphinstone, M.P., delivered an address on the proposed plan of cutting a channel for ships between India and Ceylon. A number of gentlemen interested in Indian matters were present. Sir J. Elphinstone said this question was first brought under his notice in 1842, when in command of a vessel of the Royal Navy on the Indian station. Since that time trade at Ceylon had been wonderfully developed, and passenger trade to such an extent that 86,000 passengers passed down in the direction he spoke of last year. The present channel, called the Paumben, being shaped like a snake, was not suited to ships

* Copies may be obtained in London from Messrs. Imray and Son, Minories.

of the present time, because long ships could not easily go through a crooked channel. The coast being faced by a line of rocks, with sandbanks outside, it was proposed to cut from 250 to 300 yards through the sandbanks, and through Cape Comorin, which would give access to a harbour of 16 square miles, with an anchorage of from 24ft. to 36ft., and perfectly smooth. The estimated cost of the proposed work was £90,000, and the channel could be kept clear at a small annual cost. One of the benefits arising from this would be that vessels could coal in the harbour or at jetties outside. A saving of 750 miles would be effected on the double journey, which meant something like 4 per cent. on ship expenses. In considering the question in reference to the Suez Canal, they must recollect that the whole of their East India trade had been revolutionized, so that for the future it must be a steam trade. The execution of the work would bring ships into Panks Bay, and hence the way was clear for them to Kamtjai; and he might observe, in passing, that the harbour of Galle was a wretched one, full of rocks. It was quite impossible for private individuals to force this matter upon the Government, and he should suggest that those present should interest the Chambers of Commerce in England in the matter, especially as it was a matter which would so vitally affect the cotton trade in India. After some discussion, it was resolved to bring the matter before the Government and the Chambers of Commerce of England.

ROYAL NAVAL DOCK AT MALTA.—The new dock at Malta is now completed and has been opened with some ceremony. From the fact of its having been commenced during the administration of the Duke of Somerset as First Lord of the Admiralty, it has been named the "Somerset Dock." Immediately on its being declared open, H.M.S. *Caledonia*, of upwards of 4,000 tons was floated into it. The following are the dimensions of the dock:

Length of copings	468 feet.
Length of floor	430 feet.
Width between copings	104 feet.
Width at entrance	80 feet.
Depth on sill and floor	34 feet.

The entrance to this dock is 270 feet in length.

WE understand that proposals have been made to the Admiralty for raising the unfortunate *Captain*, and that some correspondence has taken place on the subject, and also that the difficulty in the way is the inability of the Admiralty to waive the rights of the

Crown to the ship. If however, as we suppose, a Company would have to be formed for the purpose, and shares taken as a commercial speculation, we cannot help congratulating the public on the impediment, for a more visionary idea has not been advanced for a long time. True he is a rash man who in these days ventures to assert that anything is not feasible, but we may safely give our opinion of the improbable, and this scheme of raising the *Captain* seems to us to be in that category. We do not consider it simply as an engineering question, it is one in which the sailor would have as much to say as the engineer, and any venturous capitalist who feels inclined or tempted to join in the speculation, had better first consult the sailor and act by his advice.

NEW LIGHTHOUSE AT ENTRANCE OF BRISTOL CHANNEL.—In order to facilitate the navigation of the southern entrance of the Bristol Channel, it has been decided by the Trinity House to set up a new light-house on Hartland Point, on the north coast of Devon. The numerous wrecks which have occurred in Bideford Bay and the adjacent neighbonrhood, indicate a strong necessity for a powerful coast light in the vicinity. The light on Lundy Island is a good and useful light in clear weather, but its great elevation (540ft. above the sea level) makes it often useless, the light being frequently obscured by thick atmosphere. Something more reliable than a "cloud capp'd tower" is wanted to guide the mariner on that coast, particularly the foreigner bound for any of the thriving ports of the Bristol Channel; and the bold headland of Hartland being the natural landfall for the Channel for vessels from the south, seems to offer special advantages for the establishment of a really useful light. It is probable that a site of greater *local* utility might have been chosen, but for the benefit of the general up and down navigation we think the proposed lighthouse will be eminently serviceable. The new lighthouse and its buildings are to be built on a rocky spur jutting out below the very high extremity of the point, and the elevation of the light will be about 120ft. above high water. A powerful fog signal worked by a caloric engine will also be placed there.

CAPT. SELFRIDGE, of the United States Darien Surveying Expedition is said to have discovered a route for a canal near the mouth of the Atrato river, with no eminence greater than three hundred feet between the two oceans.

THE

NAUTICAL MAGAZINE.

NEW SERIES.

MAY, 1871.

OUR UNPROTECTED HARBOURS AND COAST DEFENCES.

The motion of Mr. Graves as to the necessity for making additional provision for the defence of our commercial harbours was one which commended itself to the approval of all who are interested in the development and safety of commerce. The importance of the subject must be manifest to all, when it is considered that on a sudden outbreak of war our great ports of trade would be perfectly at the mercy of any daring fellow, who, with a good ship under him, a dare-devil crew, and the prospect of "loot," should make a dash into any one of them; and after loading his vessel, and, perhaps, two or three others with booty, escape before we could summon a force to resist him. Imagine the consternation and dismay which such a visitor would spread, and the pillage and destruction that would ensue. The motion was also well-timed, because the efforts of our naval administration for many years past have been directed to the formation of a fleet of large and heavily armed ironclads; that fleet now exists, and although we believe the magnitude of these ships is, and will prove to be, a great mistake, we have got them and must make the best of them. But we have now breathing time to fill in and "point" our great wall of defence, and, by examining the weak positions before it is too late, to strengthen them; in point of fact, to effect an insurance on our uninsured property. The gentleman who brought the motion forward, it must be said, did justice to the subject, as he seldom fails to do with regard to any nautical matter which he takes up,

and by placing before the House a carefully considered statement of the case, and bringing to bear numerous important facts, he insured the attentive consideration of his hearers. Having raised an animated discussion, in the course of which the newly created First Lord of the Admiralty virtually acknowledged the motion to be true in principle and also that the Government were taking steps for the consideration of that inner line of defence, the motion was withdrawn.

The protection of our harbours and the defence of our coasts may be in great measure effectively performed by the same means, we allude to the use of gun-boats and other cruising vessels, in contra-distinction to floating batteries only intended to be moved from one part of a harbour or river to another.

So numerous are our undefended harbours, that to meet the necessity of effectually protecting them all, at one and the same time, would open the eyes of any Chancellor of Exchequer, but we are of opinion that a judicious distribution of small vessels round our coasts, and an efficient service of rail and telegraph round the coast line, are the means suggested by common sense, for our coast and harbour defence. To know instantaneously of a coming danger, and to be able to communicate the intelligence to the neighbourhood on each side of the threatened port or spot and to be able to rapidly concentrate a force to repel it both by land and water, we believe, are the great defensive desiderata in time of threatened attack.

We have already adverted in former numbers to this great want of the present day, and in recording the launch of two of our mosquito fleet, expressed our regret that there were not a hundred of them, and we hope that the Government are now fully alive to the necessity. But there is great reason to be cautious as to the form and build to be adopted as a model for such vessels, and it is to be hoped that before the scientific commission now sitting to enquire into the form and stability of iron ships separates, they will be requested to turn their attention to the subject, so that no false step may be taken, and the most suitable design and construction may be adopted. As regards the material of construction it should be remembered that the great requirements of such vessels, viz., great speed, small draught of water, and capability to carry a heavy gun are incompatible with very heavy armour plating, and we would rather sacrifice the power to resist shot and trust to the smallness of the target presented, we would prefer fast readily handled craft, to sluggish, heavily weighted, and thick plated vessels. Against this proposition we know will be advanced the great accuracy with which a shot can now be thrown, and if only one takes effect, the

gun-boat must sink; to this we would urge the question of averages, and that taking aim at a target that cannot retaliate, is a very different thing when that target is firing in return; besides, whether we had ironclads, or wooden, or composite gun-boats, they could always "hunt in couples" and be ready in a case of emergency to assist each other.

Much stress is laid on the value of our large ships to prevent the approach of an enemy's fleet into the Channel and from the North Sea, but we cannot rely on our having one antagonist only to contend against, and should be prepared for any combined attack that may be made upon us.

Our insular position requires a defensive rather than an aggressive warfare and protection to our vast commerce as the very sinew of war itself, so that to watch a Baltic fleet and one at Brest, and convoy our merchantmen, would give continual occupation to a large Navy in itself, especially when we consider the short time even the most efficient of our large ironclads can keep at sea. In the old war time, a black-listed ship has been known not to drop anchor for a twelvemonth, so if we have gained power in steam we have lost the power of keeping long at sea; the want of coal cannot be dispensed with, and engines will be subject to accidents. Our enemies doubtless labour under the same disadvantage, but we are supposing ourselves to be the blockaders as we have ever been.

Our coast defence then must not depend on our six-thousand-ton ships but on six-hundred-ton dispatch vessels and smaller gun-boats, and the presence of three or four hundred such, with the power to concentrate a squadron of them within a dozen hours, would be a greater safeguard to our shores than the whole of our ponderous ironclads assembled at anchor at any of the few ports that will contain them.

If we are true to ourselves and maintain an intelligent staff of observers and a number of dispatch vessels, no large body of men or great number of vessels could be massed in any enemy's ports for the purpose of invading our shores without our being forewarned, and being forewarned is to be forearmed. We may perhaps best explain the subject by an illustration. Say that numerous troops with all their equipments are assembled in the neighbourhood of Brest and Cherbourg, the two great naval arsenals of France, that their destination is our own shores, and that every exertion is being made with steamships for their conveyance. We will allow the troops to embark and the ships to start under favourable conditions. To us early intimation is of vital importance, and the speed of our dispatch vessels is what we should

be dependent on for it; the progress of the French fleet would necessarily have to be slow in order that they should keep together. On the first intimation on our coast the telegraph would vibrate with the intelligence all round our shores, the gun-boats would be in readiness at every cove, creek, and nook in the kingdom, would sally out probably in detachments towards the course of the enemy, and engage them at long shots as they came within range. This guerilla warfare would soon tell upon the cumbrous vessels of the enemy, whose endeavours to drive away or run after the small annoyers would be unavailing, and we do not hesitate to say that even if our fleet of large ironclads did not appear upon the scene at all, the gun and dispatch vessels alone would prevent the landing.

We have not adverted to that great feature of future naval warfare, the use of the torpedo and torpedo vessels; it is impossible to foresee for a single year what will be the effect and to what extent they will be brought in use; but that one or two should be stationary in every large commercial port is evident, and where torpedoes are to be laid in channels a competent person should be attached to each vessel, capable of fixing the position of each torpedo, and plotting its position on a chart, so that while to the enemy it would be a danger it would not be so to a friend, who could be safely piloted through by the persons who laid them.

We need scarcely point out that with the establishment of gun-boats around our coasts, the necessity would arise of speedily putting them in requisition if required; and here our coast-guard and Naval Reserve are the natural resources for the purpose, these should be told off and yearly exercised without previous notice in getting to sea and manouvring, so that even in time of peace we should always be on the alert. A small permanent staff to take care of the vessels, guns, and engines would of course be requisite, but as there would be no rigging and no wear and tear, the expense attending a large fleet of them after the first cost would be little more than the annual deterioration. Preserved provisions in tins, mess utensils, bedding, and all requirements—with the exception perhaps of powder which should be near—should be kept on board, so that a crew could step on board and the vessel steam out without any delay.

What the intentions of Government may be in regard to this coast defence, we of course are not aware, but we earnestly desire to see a little more activity in the building of gun-boats, convinced as we are of their desirability, and indeed absolute necessity. In the meantime the subject cannot be too well ventilated in order to elicit opinions from those most qualified to form them on this all important subject.

MERCHANT SHIPPING LEGISLATION.—IV. *(Continued.)* INQUIRIES INTO WRECKS AND MISCONDUCT AT SEA.

From the former part of this article it will be seen that we fully accept the fact that rotten, overladen, and otherwise unseaworthy ships are sent to sea from ports in "this our United Kingdom;" that we also accept the fact, that such ships are sometimes knowingly sent to sea, and that loss of life is too often the result. We have explained that owing to the very unsatisfactory state of the law, a seaman not unfrequently and not unwillingly elects to suffer incarceration in jail rather than to work a passage in a ship on board of which in his ignorance of her actual state, he has legally bound himself to go to sea. The British seaman has with all his characteristic disregard of danger, come to look upon the prison and the jailer under certain circumstances, not only as safer and kinder, but as better and more trustworthy, than the ship and her owner. It is true that in jail the seaman may have to undergo the inconvenient but muscle-developing routine of hard labour at a "wheel,"—to which if things go on as they are he will not altogether remain unaccustomed,—and that he may have to undergo this routine daily for four or perhaps six weeks, the monotony being only varied, perhaps, by the less arduous occupation of arranging or separating the fibres of hemp or oakum. If during his incarceration he find the periods of labour wearisome in their exact recurrence, he will also soon discover and appreciate the fact, that intervals of rest, food, and uninterrupted sleep in a dry berth, are equally exact. Weighing all things in "what he is pleased to term his mind," the certainty of a wet berth on board the wretched ship he has left; the equal certainty of hard work at the pump or aloft; the prospect of irregular periods of rest, or of regular periods of unrest; the chance or almost certainty of a personal introduction to "Davy Jones" and his locker, or of but just escaping that introduction by what the seaman calls "the skin of his teeth;"—weighing all these things, he accepts, if not with thankfulness, at least without hesitation, and in preference, a term of gratuitous board and lodging at the expense of the British taxpayer. A miserable minority of British shipowners have succeeded in maintaining in the nineteenth century the accuracy of Dr. Johnson's comparison between a ship and a prison,—a comparison in favour of the latter. He said, "No man will be a sailor who has contrivance enough to get himself into a jail, for being in a ship is being in a jail with

the chance of being drowned." And at another time, "A man in a jail has more room, better food, and commonly better company."

In addition to the fact just referred to, that some unseaworthy and overladen ships are knowingly sent to sea, we have been at pains to prove conclusively, that ships are also at times bought, equipped, manned, and loaded with deliberation, for the express purpose of being thrown away at sea, without regard to loss of life, and with regard solely to the recovering of insurance. We think we have brought out clearly the fact, that whilst in the majority of cases, ships are intended to swim, and to bring profit to their owners in an honourable and creditable manner; in some cases so far as the owner is concerned, the sinking of his ship is just as acceptable as the keeping of her afloat, and in others the ships are specially intended to be sunk, so as to bring profit in a dishonourable and discreditable way.

We trust we have shewn that shipwrecks and marine disasters, so far from always being what is irreverently and generally termed the "act of God," are frequently nothing less than the result of the culpable negligence, or direct and premeditated misdeed of man. Shipwrecks, so far from arising from unknown and unintelligible and unpreventible causes, are but too often the result of direct villainies, which can and ought to be punished with as little sentimentality, and as vigorously as any other and more common act of swindling, fraud, or murder.

In casting about for a remedy which shall prevent overladen and unseaworthy ships from proceeding to sea, and shall prevent ships from being sent to sea to be lost, we have shewn how the human mind is ever recurring to inspection and compulsory surveys, and load lines and certificates. The pass word in such cases ever is "Prevention is better than cure," and the measure of prevention advocated is always some unwarrantable measure of interference with fair trade. Such interference must inevitably cripple the honest trader,—which in the case of shipowners is an immense majority;—and if once begun, must be continued until commerce is fettered and crippled, and perhaps strangled.

That prevention is better than cure, is as true as the fact that prevention, so far as marine disasters can be prevented, need not, if properly applied, interfere with honest trade at all.

We are now about to consider the remedies for the present state of things, and in doing so we must determine exactly what results we do not want to bring about, no less carefully than what results we really do wish to achieve. The entire absence of any consideration of the first of these important points, always has and always

will lead away the zealous, but often too impulsive and short-sighted reformer. It is no more necessary to burn down a city in order to stop the ravages of an epidemic, than it is to destroy trade in order to prevent a few black sheep among shipowners from making money by casting away ships and destroying human life.

Let us then determine what we do not want to do, as well as what we want to do.

1. We do not want to hinder or hamper fair trade.
2. We do not desire to profess to do, and seem to do, more than we can do, or what we cannot do.
3. We do not want to attempt by improper and expensive and unconstitutional means, anything that we can do effectively by proper means.
4. We do not want to remove from the dishonest and the culpably negligent, the consequences and responsibility of their acts.

1. Let us assume that some system has been devised whereby every ship shall be inspected, and whereby the inspection is aimed at preventing unseaworthy ships from going to sea, and ships from going to sea to be lost. Any system of the sort to be of use must of course be complete. It is of no use to attempt by inspection the prevention of loss of life from the casting away of ships, unless the system is carried out to its fullest extent. A system that works only partially and in one direction, will merely divert the energies of the dishonest into another and to them a safer channel. We have shewn in the case of the *Severn*, that the ship was sound and seaworthy in every respect, and that the ship was nevertheless thrown away, because firstly, she was over-insured, and secondly, because certain boxes supposed to contain cargo, really contained rubbish. Any system of inspection to be valuable must be thorough, extending not only to the *bona fides* of the ship, but to her value and insurance, and the *bona fides* of the cargo. Let us then imagine a system of wholesale and thorough inspection in full operation.

Under such a state of things the owner and everyone serving in his interests would strive to prevent delay, because every delay means loss of profit. Every repair, every alteration, every addition at an inconvenient time is the cause of delay. The shipowner would therefore naturally enough not expose the defects of his ship at inconvenient times, on the contrary he would strive to hide them to prevent delays. We should have an army of inspectors at work on one side whose duty it would be to spy out defects and deficiencies real or imaginary; and the interests of the shipowners at work on the other side. A ship on coming into port would proceed to discharge her cargo. Now perhaps one of the most dangerous

things to use under certain conditions are steam winches and their chains and independent boilers, so before discharging cargo an inspector must inspect and certify that the steam winches and boilers and chains are sufficient. If he is in any doubt he must have them tested. A part could be tested on board but the chains must be taken ashore to a testing machine. He must also take steps for seeing that the inspected articles and no others are used. If the system of paternal or rather maternal interference is to be carried out, these things must be tested every voyage, as they may be damaged, or repaired, or replaced during the ship's absence. Having got the cargo out, the hull of the ship must next be surveyed to ascertain first, whether it is sound, and secondly, whether it is fit for the cargo about to be put in, which will certainly differ from that just taken out. Having surveyed the hull of the ship (in dry dock if necessary), and having had out and surveyed all her apparel and tackle, boats, chain cables, anchors, ropes, sails, etc., and having got such repairs and additions as the inspector thinks fit, and having further thoroughly examined her engines and boilers by the means of engineer inspectors, the next thing to determine is the load-line. This must be done with due regard to the nature and duration of the voyage, the time of the year, and the nature of the cargo, for it would be manifestly unjust to limit a ship's carrying capacity by her capacity at the worst time of year and with one (the most weighty) description of cargo. Having ascertained that the ship, etc., are apparently in good order, and having determined the load-line for the voyage, the next thing to be done is to see to the stowage of the cargo.

We must bear in mind that an ill-stowed cargo is fraught with more danger to the ship and the lives of her crew than a well-stowed heavy cargo. Here come into play the services of another set of officers, viz., Stevedores; but before the cargo is put on board, and in order to prevent the whole system of inspection from breaking down, the contents of every package must be ascertained by examination, for we have shewn that fraud is most profitable when practised on a good ship by the shipment of rubbish in boxes, bales, etc., with a fair exterior, instead of cargo: we must also bear in mind that explosive material shipped under a false name is doubly dangerous because unsuspected.

Having ascertained the nature of the cargo and having seen it stowed, the next thing is to ascertain the competency and sufficiency of the crew: it would be idle to take all the trouble of survey and inspection, and then to send the ship to sea with an insufficient or incompetent crew. We must then by a separate staff examine

the charts and instruments, and test the accuracy of the chronometers, etc.

The next and last thing is to fix values for the limitation of insurance. Here a separate and independent staff is required, and at last the ship gets to sea.

It may be said that the above rapid sketch is overdrawn, and represents difficulties that would not arise in practice. Our answer is that the sketch is underdrawn if anything, since it omits to notice many difficulties of detail. These difficulties, really more grave than many pointed out, the practised eye of a business man will at once discover, such as the settlement of disputes raised by questions of fact or of opinion and prejudice between the inspector and the owner, shipper, and master. But let us suppose that the whole business has been got through and that the ship is fairly at sea, what has really been done? We shall have done exactly what we wished to avoid, viz., we shall have hampered trade, we shall have caused innumerable delays and difficulties which have raised the price of goods by increasing the cost of transport, we shall have superintended and directed the owner's work for him,—but

2. Have we really done what we seemed to do and professed to do? have we lessened the chance of loss?

This depends upon circumstances. If the ship is the property of one of the respectable members of the great and respectable body of shipowners, we have not done by our interference what we have seemed and professed to do; because the ship and her apparel, tackle, cargo, and crew would have been at least as good, as well-stowed, and as efficient without our interference as with it. In this case which we may take as representing ninety or ninety-five per cent. of actual voyages we shall have done no good, we shall not have done what we seemed to do, but further than this we may have done positive harm, for we may and probably shall have deputed the work to a less efficient set of men than the practical and practised officers and employés of the owners, whose services and experience are compulsorily dispensed with. But suppose on the other hand we have been working on a case in which the ship might have been in the opinion of the inspectors unseaworthy, then anyhow, the advocates of the system will say, she would have been condemned or have been repaired; or suppose her equipments were in the opinion of the inspectors inefficient, we should at any rate have had them replaced; or suppose her cargo would in the opinion of the inspectors have been too heavy or improperly stowed, we should have got that put right, that is to say we should have got it stowed in accordance with the views of the inspector, which may or may not

be right; but in assuming all this, in assuming that everything done by direction of the inspector is right, we assume three improbable things, viz., 1. Infallibility of the inspector's opinion and judgment, 2. Honesty on the inspector's part far in excess of the honesty of the trader, 3. A performance of the inspector's duty more efficient than the performance of the duty of a man specially accustomed to the work. A failure in any of these respects and the system breaks down.

We must not forget that one of the evils of a system of wholesale inspection would be that the inspector would become a policeman of the most odious description, and the system under which he acts would be an inquisition in its worst forms. It is possible that some ardent advocates of the inspection theory and principles can believe in the perfect and spotless competency and honesty of all such inspectors; but if such a belief is possible, then indeed it is marvellous how they can also disbelieve in the honesty of a shipowner, or how they can believe in dishonesty at all.

If the whole system we have been considering were not carried out thoroughly and honestly in every particular we shall in acting on it only partially, have been seeming and professing to do what as a matter of fact we have not been doing; but supposing the system to have been carried into effect thoroughly, we should still have been seeming and professing to do more than we have been doing. All that the system in its utmost perfection (a perfection which in practice it could by no means attain) would be able to do, would be the providing certain things and possibly ensuring a certain state of things before the commencement of a voyage; but it could by no means guarantee that that state of things, and those things would be maintained and used properly or even used at all. The only real chance then of bringing the practice of such a system to a par with its profession, would be to send an unimpeachable and irresponsible Government Inspector to sea in each ship. But even then such a system would not prevent the most serious loss of life, for as pointed out above, that loss now happens in passenger ships which are already doubly inspected, and commanded by officers of the greatest experience. Nor must we for a moment forget that loss of life happens in ships bound to this country as much as in ships bound from this country, and that the former ships would not be reached by the system we have been exposing.

3. Assuming however that with all the difficulties, expenses, inconsistencies, and delays we have pointed out above, we have really prevented some rotten and overladen ship from going to sea from this country and have prevented the chance of a ship from

going to sea with a fraudulent cargo from this country, have we achieved our result in the best manner? Have our means been constitutional and unexceptional. This can scarcely be so for the following reasons:

(a) Where there has been no desire on the part of a shipowner to send an unseaworthy ship to sea, we shall have harassed him as much as if he were one of the dishonest, and we shall have harassed him to no purpose.

(b) We shall have inspected ninety or ninety-five per cent. of ships and cargoes and crews that did not need inspection.

(c) We shall have set aside the skilled services of the owners' practical servants, in favour of the services of irresponsible and perhaps less competent, certainly not more competent, inspectors.

(d) We shall have kept from some useful and productive labour a whole army of inspectors.

(e) We shall have increased the cost of transit.

(f) We shall have saddled the British taxpayer with the salaries of the inspectors, etc., amounting to upwards of £750,000 a year.

(g) We shall have placed the British shipowner at a great disadvantage as compared with foreign shipowners, and above and beyond all we shall have effected exactly what we did not and do not want to do; viz.,

4. We shall have removed all responsibility from the owner and his servants, which would otherwise have attached to them for culpable or negligent conduct.

As regards this removal of responsibility, we must not forget as pointed out in the early part of this paper, that to absolve a man from responsibility is not as a rule, in the ordinary course of business and daily life, deemed to be the best way to make him careful. The one link that serves more than any other to bind society together, is responsibility for personal acts whether of omission or commission. Let us suppose that the directors of railway companies, the owners of mines, and of factories, and of ships, the owners of horses, and employers of labour generally, were by law to be held irresponsible for damaging and destroying members of the public or their own servants, provided that certain forms of inspection are gone through, and provided that certain regulations are complied with; would such entire removal of personal responsibility be likely to increase their personal desire for the safety of lives, or would it not rather have precisely the opposite tendency?

But it may be said that we are assuming too much in assuming that the system of inspection relieves the owner of responsibility. Our reply is that as a matter of fact it does relieve the owner, and

that if it were not to grant that relief it would be monstrously unjust to him. As a matter of fact we may mention one or two cases coming within our own knowledge. On the 3rd November, 1860, the boilers of the *Tonning* blew up, and five men and three boys disappeared altogether, five more were landed dead or dying, and five badly scalded. Out of thirty people on board seventeen only escaped alive. Now here was a case in which the boilers had been inspected by the Government Surveyors, and had been passed and certified as proper and as fitted with proper safety valves and appliances; but the inspecting and certifying did not guarantee and never can guarantee that the boilers, etc., if efficient, will be efficiently used. In this case the Coroner laid it down as law, that as the steamer had been surveyed and had obtained a certificate the owner was not responsible.

Let us take another case. An old boiler not coming under Government survey was inspected at the request of the owner by a practical man, and pronounced by him to be safe and sound. It burst six months afterwards with fatal results to life and serious results to property. At the Coroner's inquest the owners were committed for manslaughter, and took their trial at the Winter Assizes at Liverpool. The Judge however ruled that inasmuch as the prisoners had caused their boilers to be inspected, they had deputed their responsibility, freed themselves from blame, and must be acquitted.

We believe both of the above decisions, though perhaps logical, to be quite contrary to law, but they serve to shew how as a matter of fact inspection lessens responsibility. If this wholesale inspection should ever become compulsory in the United Kingdom as it is in the United States, it must be attended with freedom from responsibility; and in that case, so far from the advocates of wholesale inspection effecting a saving of life they will increase the amount of loss. This then is another result we do *not* want to achieve.

What we want to do is—

1. To prevent as far as possible ships known to be unseaworthy from going to sea.

a. To do this we want to give seamen fair play, and a fair and efficient survey when they allege that a ship is unseaworthy; and

b. To afford fair and reasonable facilities for investigating all allegations of unseaworthiness.

2. To punish offenders.

To attempt more than is above indicated will be to attempt too much. To do what is above indicated will be to do all that can be done, and will not expose us to the charge of professing and

seeming to do more than we do in fact; nor of interfering in any way with the concerns of honest traders.

We must now see how far the proposed bill of the Board of Trade goes in the matter.

First, as regards unseaworthy ships we are rejoiced to find that the bill does not contemplate the wholesale survey of every ship afloat, nor the marking of a load-line on ships.

The memorandum of Mr. Farrer on the Bill says, "This Clause (234) is new and important. It is intended to meet the case of ships which, by reason of their age or otherwise, are so defective in their hulls as to be dangerous to life. It provides that, upon complaint to the Board of Trade that any ship is in such condition, the Board may direct one of their Surveyors to survey the ship; and if he finds that she is not seaworthy may prevent her from going to sea. If the owner feels himself aggrieved he may appeal to any local Court of Admiralty, which shall have power to order a fresh survey."

Now we think that this is a very good clause as far as it goes, but we do not think it goes far enough. It is not easy to understand why the provision should not apply to masts, boats, boilers, etc., as well as to the hull. With this extended application it appears to us that the Bill would go far enough as regards ships notoriously dangerous. It is in effect similar to the clause applicable to dangerous houses and buildings ashore.

And as regards complaints by seamen of unseaworthiness, Mr. Farrer points out that Section 412 of the Bill gives power to seamen to get a survey of unseaworthy ships. Mr. Farrer states that "This section (412) is new. It frequently happens that seamen after joining the ship desert or leave the ship at some port of call on the ground of unseaworthiness, and are taken before the magistrates on a charge of desertion. In these cases the seaman cannot give evidence, and the justices have no means of procuring a competent and impartial report. It is by this section provided that the justices shall employ a competent and impartial surveyor to report on the condition of the ship, such surveyor to be either one of the Board of Trade surveyors, or a person appointed for the purpose by the Board of Trade, or if there is no such person, by the justices themselves. The costs to be determined by the justices and to follow the result." We are glad to see that this employment of an impartial surveyor is to be made compulsory, for at present the justices, who are sometimes personally interested, take no pains to employ an impartial surveyor, or any surveyor at all.

As regards the broad question of punishment of offenders, or

rather the broad question of the bringing of offenders to justice, we are sorry to see that no adequate provision is made. We are not disposed to blame the Right Honourable Gentleman at the head of the Board of Trade for this omission. Our regret is rather founded on the fact that other departments have not made sufficient progress with the work in hand to enable the legislature to take up the subject of establishing an office of public prosecutor. The bringing of offenders to justice is a large question connected with the office of a ministry of justice, and is altogether above and beyond any partial question that may arise as regards Merchant Shipping Legislation, and we must rest for the present in the hope, not without reasonable grounds of being fulfilled, that before long public prosecutors will not be unknown, and that by their aid many crimes will be brought forward and punished, that now owing to the absence of any such officers go unpunished to the encouragement of evil doers and to the wonder of others.

In the meantime we should like to see if it be possible and wise some declaratory enactment to the effect, that it is the duty of every British shipowner to send his ship to sea in a seaworthy condition in hull, equipments, and machinery. A very general belief exists amongst a certain class of shipowners, that as between the owners and masters and crew, the owners are not legally bound to keep their ships seaworthy, and are not legally responsible for loss of life among their crews, arising from unseaworthiness, or disrepair, or inefficiency of ship or equipments, or of negligent or improper navigation. When death or personal injury arises from unseaworthiness, etc., we have, however, on the contrary, reason to believe that persons injured and the relatives of persons killed, really can recover in such a case; but the fact that they never, or if ever, very seldom try to recover, shews that some declaration of principle or that some simplification of legal procedure is necessary. If possible and if it can be done without lessening the force of common law, it would no doubt have a very beneficial action if the new code declared positively, and in plain words that "every British ship shall be seaworthy in hull, machinery, and equipments." This simple declaration would as many believe be of more value than a host of inspectors. It would as we have shewn, be in direct opposition to the existing practice and opinions of some shipowners, but it is difficult to understand how any member could be found to rise in his place in Parliament and object to it on behalf of the shipping interest. Some attempt in the direction we have indicated, but only so far as equipments are concerned is made in Clause 409 of the Bill, and this clause affords a fair example of the

difficulties of attempting details. Under that clause as it now stands, it is very doubtful whether a sailing ship would not be deemed to be efficiently equipped without a single pump on board, because pumps are not specially mentioned as applicable to sailing ships. It is of course intended that ships shall be built provided with the equipments named in that section, in addition to the ordinary and proper equipments of all ships; but the section does not say so in express words, and by mentioning some equipments and not others may give rise to doubt among coroners and juries, and may be taken advantage of by the minority of owners to whom we have more than once referred.

As regards overloading, a clause is inserted in this bill providing that the draught of every ship may be marked and recorded before she leaves for sea. Mr. Farrer points out that "a provision is added to the effect that the master shall, on going to sea enter the draught of water in the official log-book, and produce such entry whenever required." The underwriters will thus have the means of throwing up their liability whenever they find that a ship is laden beyond what they deem to be her proper depth. This, coupled with the provision for survey when seamen object to proceed to sea on the ground of unseaworthiness, will have more effect in preventing overloading than anything attempted in the way of compulsory load-line. To our mind the President of the Board of Trade is acting wisely in rejecting Mr. Plimsoll's Bill, and all measures involving compulsory wholesale inspection; and Mr. Plimsoll is acting equally wisely in keeping the subject of loss of life at sea before the public. The evil is a crying evil, and those who wish it remedied will do well to keep it crying lustily. The remedies proposed by the advocates of inspection are altogether and outrageously wrong; still until something is done we hope they will not cease their clamours. The President of the Board of Trade stands between the most powerful and the most persevering interest in the world, "the shipping interest," on the one hand, and the public barely represented and often seriously misrepresented on the other hand, to see justice done to seamen and passengers; and it is to be hoped that, although the proposals of Mr. Plimsoll will no doubt effectually prevent the adoption of his measure, the spirit with which he is actuated may remain active and may enlist the services of others in a good cause. Instead of an independent and imperfect measure, we hope to see the Government measure made perfect, and proper means really established for condemning a rotten ship in port, as easily and effectively and with as little compunction and as little annoyance to respectable neighbours,

as a rotten house in the slums of Westminster or a pestilential cellar in St. Giles's is now condemned by the district surveyor on shore.

From the tenor of this article it will be seen that our greatest fear is that by crowding the statute book with minute regulations and details we are and have been lessening responsibility, and removing from owners and masters the fines and other punishments that ought to visit them for acts of negligence and culpability. Much thought is not required on the part of any one to enable him to decide whether legislation of this sort is not likely to tend towards the increase of loss of life, rather than towards its decrease. But as the effort of thinking the matter out is too great for some persons, they may take the facts as they find them, which prove that loss of life from marine disasters is on the increase, and has been on the increase ever since the government has attempted to deal with the evil by crowding the statutes with details; that the greatest loss of life does, as a matter of fact, as we have already pointed out, happen in ships at present surveyed and certified, and that culpable negligence or gross misconduct resulting in loss of life, instead of being punished as it ought to be by imprisonment, is now, as a rule, only visited by the suspension of the certificate of the officer or officers of the ship, for periods varying from three months upwards, whilst the owner goes scot free. To understand exactly how the law since 1851 does work, we have only to look at the slight punishment (suspension or cancellation of certificates), or entire absence of punishment following serious offences, and to compare these with the operation of the common law before 1851. The elaborate Wreck Register of the Board of Trade will give us the particulars in detail of cases since 1854, and to illustrate the consequences attendant on culpable negligence before that time we will proceed to reproduce the remarks of the judges who tried the case of a ship wrecked in 1850. It is due to Mr. William Stirling Lacon to state, that he first brought the following Scottish judgment to our notice, and obtained its recent publication. It is also due to Mr. Lacon that we should here acknowledge the kindly courtesy with which he readily granted leave for us to make what use we please of his labours. We can make no better use since we have his permission, than to reprint the speeches of the judges in the *Nautical Magazine*. We entreat our readers not to miss a word of the speeches of the Lord Justice Clerk and Lord Wood. To those of our readers who are nautical men just entering on their duties, this case may serve as a grave warning, and to other readers who like ourselves are desirous of seeing some really useful measure of reform in our statute book, the case will help us to the conclusion that our legislature have meddled

and muddled enough in the direction of details; and that the time and opportunity for some wholesale, wholesome, and vigorous line of policy,—a policy that shall restore and assist the action of the common law rather than cripple it,—has now arrived.

Case referred to.

"Culpable Homicide—Culpable Neglect of Duty and Loss of Life. Held 1st, that these were substantially one charge whenever an accident happened which occasioned loss of life; 2nd, direction to jury that when the Crown had proved an accident by loss of life in a vessel under panel's command, it lay on them to prove their innocence of all blame."

The Lord Justice Clerk, in charging the jury, observed "that, as had been remarked in many cases, there really was no difference between the crime of culpable homicide and culpable and reckless neglect of duty, which resulted in the loss of life, and the jury must, therefore, under their charge, consider the case as one of culpable homicide. Intention to do wrong was not part of the crime of culpable homicide; if intention was proved under such a charge, it would amount to murder. The crime of culpable homicide was committed whenever a person unintentionally committed an act whereby the life of another was lost, or where he failed to perform his duty, when charged with the preservation of life, without having a sufficient excuse for such neglect, and life was lost in consequence; and it was the wish of the Court to express this the more strongly, as they were of opinion that the introduction of two charges, amounting in law to the same offence, under circumstances such as those which had been proved in the course of this investigation, was inexpedient, as tending to distract and confuse the minds of the jury."

The principles of law, the Court was bound to lay down to the jury, had been much considered in recent cases, particularly that of Paton and McNab, November, 1845, Brown, vol. ii., p. 515, and it consisted in this: "That any person placed in a situation in which his acts may affect the safety of others must take all precautions to guard against the risk to them arising from what he is doing." That would also be the principle adopted and enforced by the Court in the cases referred to by the counsel for the panel, though, no doubt, exceptional expressions might be found in almost every case, occasioned by the peculiarity of the facts proved at the trial. The jury must take into consideration the whole indictment, as forming one substantive charge: and on the proof which had been adduced they would consider whether it was sufficient to establish the charge which had been preferred against the panels respectively.

It was unnecessary that the panels should be guilty, to the same extent, of culpable neglect of duty which occasioned loss of life. There might be innumerable degrees of guilt under such a charge, occasioned not merely by the amount of recklessness displayed, but by the duty and responsibility which the party had undertaken. The principle however being, as before stated, that a party charged with care of life was bound to exercise to the utmost extent all the caution and care within his power, such an occurrence as that before the jury, where a vessel was shown to have been sailing for a long distance unusually near shore, and at length, immediately after seeing Portpatrick Harbour Light, continuing the same course, until the vessel was struck on a well-known rock, on a calm and comparatively a clear night, threw on those on whom her management depended the *onus* of showing respectively that they had done everything within their power to prevent the occurrence of such a catastrophe.

No doubt the guilt might arise from totally different circumstances; that of the captain from improperly leaving his vessel in charge of the second mate; whilst that of the mate might arise from the manner in which he exercised the trust reposed in him; but though the circumstances which tended to establish the charge might be totally different, that would not affect the question, as to whether both could be convicted under the indictment.

It was not a relevant defence for the captain to say, that the mate had navigated the vessel in a more careless and reckless manner than usual, if he, the captain, was not justified in committing her to the care of the mate at all. On the other hand, it would be equally no defence to the mate to say, that the captain having improperly committed the vessel to his care, he had so completely neglected the charge he had undertaken, as after repeated warnings, to run on shore by a course of reckless navigation, whereby the vessel was wrecked and large loss of life was occasioned. The jury would consider the facts under reference to the libel, and see whether or no there was charged against the panels neglect of duty of that species which has been proved as affecting each, as it would not do to convict them on belief that there was some other duty, not charged in the libel, which had been neglected by either or both of them, the observance of which might have averted the catastrophe.

The duty of the party entrusted with the care of life must necessarily vary according to circumstances, and the capability of ordinary endurance for its discharge; thus it would not be contended that a person in command of a ship sailing to a distant port, through open seas, was bound to exercise, or could by possibility exercise, the same amount of endurance and watchfulness in the management of the vessel, which the captain on a short course, and especially on a coasting voyage, would be bound to exercise, any more than it would be contended that there was no difference in the amount of watchfulness required by the captain in a vessel at sea, whether the weather was calm or tempestuous.

The responsibility of each voyage was much affected by the character of the voyage itself, the weather in which it was performed, and the ordinary physical capacity of a healthy man to perform the duties he undertook to discharge. It was a common remark, that persons circumstanced as the Captain was, would be sure to take every known precaution to avert danger from himself, and it had been strongly urged by his counsel that he had done nothing on the occasion of the accident different from what was done according to the practice of all captains on that navigation. If, however, the jury were of opinion that there was culpable neglect of duty in what he did, that it was not necessary to retire to rest at the period in question, and that there was culpable neglect of duty in leaving his post, it was no answer in law for him to say, that others had been in the practice of committing the like wrong. Nothing could be more mischievous than such a doctrine, as it was the occasion of almost all like accidents. Men became accustomed to perils, and daily became more and more daring and rash in the exercise of their avocations; and it was surely no answer, when at length the danger which had been so often run, resulted in the death of some fifty beings, to urge that hundreds daily before had been in danger by a course of like reckless conduct. It was much to be feared that captains often ran close to the shore to avoid currents and tides in order to save time; and having escaped disasters on repeated occasions by such courses, they became over confident, and at length adopt a course which at first they would have thought it insane to attempt. That was the great occasion of accidents of all kinds; but the leading principle to be adopted in judging of such cases,

was not how near the coast a captain might venture without danger, but how far off he ought to keep in order to avoid all risk whatsoever; and, as before mentioned, it was incumbent on the captain to show that he had not authorized a course to be followed, within which there was any risk, as also, that he had not improperly delegated his charge to the mate, before, in law, the jury would be entitled to acquit him of blame for the accident which had occurred.

It was in evidence that there was no division of labour or trust by the employers, between the captain and the mate, and, more especially, there was none between captain and second mate. There was thus a delegation of duty by the captain to an inferior officer which, if unwarranted in itself, could not be justified by any instructions in the service. This took place on a voyage, which on ordinary occasions, did not exceed fifteen hours, and which on the occasion in question commenced at Liverpool at four o'clock in the afternoon of a beautiful summer day, when the vessel was steered down the Mersey by the river pilot, thus for that portion of the voyage lessening the captain's responsibility. Could it be said then, that the captain was not bound to have started fresh from Liverpool, so as to have enabled him to remain on watch during so short and easy a voyage. It was quite different, as before stated, from the case of captains out at sea. It was not pretended that the captain's duties required him to superintend the loading of the vessel, and this still further left him without excuse on the score of physical inability to maintain the watch throughout the night.

It had been urged that the course kept by the ship from the Mull of Galloway northwards, on the night of the accident, was pretty much the same as that observed usually by steamers trading between Liverpool and Glasgow. No doubt companies were anxious to make quick voyages for the sake of profit, and captains were anxious to please their employers by performing the passage as quickly as possible. The evidence as to this was somewhat contradictory (which his Lordship read), but the fair import of the whole appeared to be, that they were much nearer the coast during the whole course than usual.

If the jury thought such was the case, it bore upon the captain in two ways; first, in respect of having sanctioned a course so near the shore, as he was shown to have been on deck long after passing the Mull of Galloway. And, second, in having committed, under such circumstances, the charge of the vessel to another. It had been said, that there was nothing more than error in judgment attributable to him. That he did err in judgment, as before mentioned, was undoubted, had his conduct been intentional to produce the disaster which occurred, his crime would have been that of murder. The question was, did he, charged with the care of a vessel containing so many passengers, culpably leave her to the care of another, by whose mismanagement the wreck was occasioned.

Honesty of intention, and anxiety to serve the interests of his employers, did not form a justification even for directing or sanctioning a course so near in shore. His primary duty, and one which no commands from the Company could absolve him from, although it might render them guilty in respect of having issued them, in case of their directing so unsafe a passage, was to preserve the lives of the passengers who sailed in the ship, and on the whole matter the jury would have to say as regarded the captain, whether or not he had been guilty of the culpable and reckless neglect of duty charged, either by directing or sanctioning an unsafe course, or by having unnecessarily and culpably delegated his duty to the mate.

As before mentioned, the Crown having proved the accident to have occurred under his command, it fell on him to prove that he was entirely innocent in both respects. If the jury thought he was culpable in *any* degree in respect of the matters charged in the indictment, they were bound to find him guilty, leaving the question of punishment for the determination of the Court, who would consider the amount of guilt.

As regarded the case of the mate, the case that had been principally made for him as to the deflection of the binnacle compass, entirely failed. It was proved beyond doubt that the land was visible the whole way from the Mull of Galloway northwards. It was in vain then to talk of a deflection of the compass on a coast so well known as Wigtonshire, and the jury would consider whether or not it was consistent with innocence that he did not keep further out at sea, when the land within sight was a rocky shore, more especially after receiving warnings from the seamen who were on watch, and who admonished him of the fact, and more especially after passing so close to Portpatrick Harbour, the light of which was seen and recognised. Had he called the captain when he perceived himself so near the shore, and had the latter sanctioned the course which the mate was then following, the mate might have been as much relieved as the steersman, who obeyed his (the second mate's) orders. Nothing of the kind, however, was shown to have been done by him, and the jury would say, having regard to the doctrines of law laid down in the case of the captain, whether the mate could be entirely innocent of the neglect of duty charged, so as to enable them to acquit him.

His Lordship also remarked, in reference to the case of the boats, that although the Court thought that there was not enough to warrant the jury in convicting in respect of neglect of duty as to them, yet the facts proved, and the lamentable results which had happened from the state in which the boats were at the time of the accident, and their original construction was most important, as showing the consequences of inefficient boats in case of accidents. Should it be found on any future occasion that life was lost in consequence of inability to launch or navigate the boats, arising from such impediments as the coverings which had been spoken to in this case, or any other device resorted to for the purpose of economy, either of the boats themselves or the vessel to which they belonged, grave criminal responsibility would arise, as well to the captain, who neglected to use all appliances in his power to keep them in proper order, or to the proprietor who should fail to have supplied sufficient boats in the first instance, or refused proper allowance to have them maintained.

"The jury, by a majority, found the captain guilty of culpable but not reckless neglect of duty, and unanimously found the panel (the second mate) guilty of culpable and reckless neglect of duty, as libelled."

Lord Wood remarked; "The ship left Liverpool on the 17th of the month of June, a fine vessel, one of the finest in the trade, a vessel fully equipped for the voyage, having on board at the time a valuable cargo, and no less than 200 people, consisting of crew and passengers, and she was a vessel with a steam engine of great power, and capable of being propelled at the rate of 14 or 15 knots an hour. When such a vessel, with such a cargo, and with so many persons on board, left the port of Liverpool, it appears to me that every man who had any charge in the navigation of her should have left it with the thought indelibly impressed on his mind that no vigilance, no care, and no anxiety, which he could bestow in the navigating of the vessel to her port of destination should be awanting.

"Your Lordship emphatically stated that it was the paramount duty of every one navigating such vessels to consider first the safety of the ship and passengers. The contrary course appears to have been followed here. The captain chose a coasting course, apparently trying what peril the vessel could be put into, and yet bring her to her port of destination, instead of his thinking only how he could carry her there in safety. And carried she might have been, for it was a clear course—a known course, it was an accustomed voyage, and she was under the charge of those who knew every part of the voyage. Now, my lords, in these circumstances, the jury has found, by a majority, the master guilty of culpable neglect of duty as libelled, and they have unanimously found the second mate guilty as libelled. The second mate has been found guilty of culpable and reckless neglect of duty in navigating this vessel, by which neglect the vessel was wrecked, and that melancholy loss of life charged in the indictment, occasioned. I am sorry to say that I feel it impossible, with such a verdict, in such a case, to propose any other sentence than one of seven years' transportation. Any other sentence would be an inadequate one, and would neither satisfy the law, nor the great interests at stake. But we are enabled, and I am most happy, by the verdict, to make a distinction in the amount of punishment between the mate and the master, because the jury in his case have found him only guilty of culpable neglect of duty, and not of reckless, as well as culpable, neglect of duty, and certainly it is a very material difference in the verdict with regard to him. If the verdict had included in it recklessness on his part, of course there could have been no other sentence than one of transportation; but I feel, as every one must feel, that in dealing with the case of a person such as the master of this vessel, no sentence which the law could pronounce would make any impression, unless it was one that would bear severely on him. In these circumstances, making every allowance for the distinction which the verdict admits of in the case of the parties, and by every consideration which I have been able to bring to mind, and I have every desire to make such a distinction in the case as is consistent with the ends of justice, I have, after much consideration, come to the conclusion that the sentence may be mitigated to one of imprisonment, although it must be one of time, and such a sentence, as those in charge of such vessels must feel that, for the very slightest neglect of duty, which is followed by such disastrous results as occurred in this case, and even far less, they must answer to the law. I, therefore, propose a sentence of imprisonment for eighteen calendar months."

It will be interesting to follow and record the action if any hereafter taken in a recent case of collision between a barque and a fishing boat, off the Lizard. The collision was attended with the loss of seven lives.

Under the Merchant Shipping Act of 1854, Sec. 292, the barque, if she was, as stated in the Mercantile Navy List, a ship of 844 tons register, was required to carry either five boats of 1730 cubic feet or four boats of 1888 cubic feet. The penalty for not carrying these boats, or for not replacing any of them accidentally lost or injured, or for not keeping them at all times fit and ready for use, is, if the master is in fault, a penalty not exceeding £50; and if the owner is in fault a penalty not exceeding £100.

Besides these obligations and penalties there is another obligation and penalty under the Merchant Shipping Act, 1862, Sec. 33. By that section it is provided that in all cases of collision, the person in charge of such ship is to render such assistance to the crew and passengers of the other ship as may be possible *without danger to his own ship*:—and if this assistance is not rendered and no reasonable excuse for the failure is shewn, the collision "shall in the absence of proof to the contrary" be deemed to have been caused by the "wrongful act, neglect, or default" of the person failing to render it —and his certificate may be cancelled by Board of Trade inquiry.

Still further is another obligation and another penalty. This further obligation is to observe the steering rules; and if damage to person or property arises from non-observance of the steering and sailing rules, then unless there were special circumstances justifying a departure from them (to be determined by a proper court), the penalty on the person in charge of the ship is that he shall be deemed to have been guilty of wilful default.

In addition to these statutory penalties in cases of collision, the owner of the ship proved to be in fault is liable to an action at law by the relatives of the deceased, and for any damage done to the other ship, and the master or some officer of the ship proved to be in fault would if in Scotland be liable to be punished for culpable homicide or culpable neglect of duty, and in England is probably liable to punishment for manslaughter.

There has been a Board of Trade inquiry into this collision, and the certificates of the master and mate of the barque have both been suspended for twelve months.

It appears from the report of the Magistrate and Assessors that the barque was bound from Falmouth to Liverpool. That between nine and ten p.m. she fell in with a fleet of fishing boats.

At ten p.m. the master went below, leaving the chief mate and an unlicensed man acting as pilot on watch.

Lights were seen in every direction round the ship showing that the greatest caution was necessary.

At eleven p.m., a light from a fishing lugger was seen ahead and reported to the mate of the barque. Three flash lights were subsequently shewn from the fishing lugger. Just as the third flash was seen, the mate sung out to "luff" and then "haul up," but it was too late to avoid the collision. The ship was going six knots, and the lugger was cut in two. Ropes and a life buoy were thrown from the ship, but only one of the lugger's crew was saved, and he was not saved by any effort from the ship, but was found clinging to the ship's head gear with his leg broken.

The master, who came on deck immediately after the collision, gave no orders to put the helm down or back the sails, nor was any boat lowered or other effort made to save life, beyond hauling up the main sail and lowering the upper sails. But the ship continued on her voyage to Liverpool.

There was abundant warning of the ship's approach to the boat that was run down, but the mate made no effort to avoid the casualty till too late.

The court held him in default, and suspended his certificate for twelve months.

As regards the master, instead of heaving his ship to and lowering a boat, which might have been done "without danger to his own ship and crew," he confined his efforts to shortening some sail, and proceeded on his voyage. For omission to render such assistance as was practicable, the court held the master in default, and suspended his certificate for twelve months.

The Board of Trade inquiry may end the matter, as it has in other cases, or the matter may end when the owners of the one ship pay for the other ship and for the lives lost, or, owing to the interest taken in these cases now that they are being ventilated, the matter may not end until the Attorney-General has had an opportunity of taking the case into court on behalf of Her Majesty's Government, with a view to recovering the penalties incurred for not keeping the boats of the barque at all times fit and ready for use, and with a view to punishing the parties through whose default the collision and loss of life happened, by arraigning them for manslaughter. When life is lost from the careless driving of a vehicle in our streets, the driver is charged with manslaughter. It is not easy to understand why a man in charge of a ship that drives over another, causing the loss of seven lives, should be treated differently from the driver of the vehicle.

The provision in the Merchant Shipping Acts for inquiry has, to our mind, been the one bright redeeming feature in recent legislation; but even that provision, important as it is, and good as it is, had better be repealed at once, and absolutely, unless its continuance is so arranged as to assist, and not to supersede a course of action, similar to that taken in the former case. In both these cases we have purposely abstained from giving the names either of the ships or of the masters and officers, as we do not think that the quotation at the head of our paper is at all applicable to them.

In our next article we propose to touch on the following subjects, viz.: Crimping, provisions, health and accommodation of seamen, and settlement of wages.

JAMES KENNEDY.

A Tale of the War Time.

By JAMES B. KENNEDY, Lieutenant, R.N.R.

Chapter III.

It was in this ship (the name of which I have not given as the son of the captain is now an officer of high rank and holding a responsible position) while lying moored in a harbour,—which shall also be nameless,—my father being captain's coxswain, the captain fell in love with a young lady, whose father would not allow her to have any thing to say to him. He therefore persuaded the young lady to agree to elope with him, and for the purpose of effecting her escape, a small Jacob's ladder was made on board out of deep sea lead line. One day after we had "cleared hawse" and "passed the messenger" all ready for unmooring ship, for we had heard we were under orders to sail the next day, the captain sent for my father to his cabin and told him to have his galley ready alongside by six bells (eleven o'clock), to have the oars muffled and the crew dressed in blue. My father was rather puzzled at receiving these orders; had it been near an enemy's port he would have supposed that either a cutting out expedition or an examination of the contents of the enemy's harbour was meditated, but as no orders were given to arm the boat's crew, he could only guess from the Jacob's ladder being made that it was not war, but love that he was to be engaged in the cause of. However, so accustomed was my father to obey, that to look into the why or the wherefore scarcely ever entered into his head. My father noticed the captain in earnest conversation with the first lieutenant, but always in an undertone; as they turned in their walk, my father heard the first lieutenant say, "You may depend upon it, sir, that everything shall be ready," and the first lieutenant rubbed his hands together in a peculiar manner he had when he was much pleased, and went below.

At six bells my father reported the boat ready to the officer of the watch, who told him to report it to the captain himself, which he did. "All right, Kennedy," said the captain. "Is the Jacob's ladder in?" "Yes, sir, and twenty fathoms of white line and a ball of spunyarn, as you ordered." "Very well," replied the captain, "now take that lantern and my boat cloak and tell the steward to give you the basket." In a few minutes the captain was in the boat and

they shoved off. As they neared the shore they were directed to pull slowly and not to splash with their oars, and rounding a rocky point into a small cove, the boat was beached on the sand. "Now, lads," said the captain, "I may as well tell you that I am going to take a lady off with me, and if I am successful I will give each of you a guinea. Robinson and Craig you remain with the boat and see you keep her afloat, the other four follow me, light the lantern and put it in the bag, and bring the Jacob's ladder and other things," and he jumped out of the boat and ran up a zig-zag path in the cliff.

On reaching the top of the cliff he told the man with the lantern to remain there and to keep his weather eye open, and when he heard three distinct whistles from his dog-whistle, he was to show the light. After passing over a small heath covered with furze, they crossed a road and then over a hedge where they stopped, and with their knives cut the lower parts of the bushes and passed a piece of spunyarn round the portion cut; a white handkerchief was tied to the spunyarn to mark its position: they then approached a rather large looking house which was very conspicuous from the ship.

The night was rather dark and the house was situated in the midst of a shrubbery, closed in by a wooden fence. Having arrived under this fence on one side of the house under a thick over-hanging tree, which threw them completely into the shade, my father and a man named Jameison (who from being six feet three in his stockings was known as "Long Jemmy") were told to go round one side of the fence to see that the coast was clear, but by no means to go into the road that passed in front of the house, and if all was quiet, my father was to leave Jameison under the hedge by the road to keep watch and come and report to him, and Jameison was to make the best of his way to the boat when he heard the three whistles, or if he saw anything suspicious he was to whistle once. The fence was just high enough for my father to see over, and the two went round carefully peeping into the grounds through the shrubs until they reached the opposite side to that on which they had left the captain, when they suddenly stopped on hearing a movement among the shrubs, "I can't see anything, Jemmy," whispered my father, "but I am sure I heard something moving." "So did I," said Long Jemmy, straining his neck over the fence, and his eyes to their utmost. "What shall we do," said my father. "I'll throw a stone," said Jemmy, "and if it is any one watching, we shall have plenty of time to give warning and get away, so he took a stone and threw in the direction in which they had heard

the noise, there was no doubt then but that they were right, for not only did they hear the movement, but they could see a figure rise from the ground and, as it appeared, retreat towards the house in a stooping posture, "There's only one," said Long Jemmy, "and if I could only get hold of him, I'll take care to keep him quiet enough, if I choke him; I can vault this fence easily, so here goes," he took a few steps back, ran at the fence and over he went, but to the surprise of my father his head and shoulders were still to be seen: "Kennedy," said Jemmy, "I'm hanged." "I think you are," said my father, interrupting him, and trying to look over, but could see nothing but Long Jemmy's back. "Give us your knife open, quick," said Jemmy, and my father slung it over to him by the lanyard, and a moment after there was a loud tear and splash, "hush," said Jemmy, "I'm all right," and he crept away in among the shrubs: in a few minutes he returned and told my father to go towards the road until he found a better place for his exit than he had for his entry and which he found at the corner by the road.

"What was it," said my father, as Jemmy got safely over, "but what the devil have you been doing," added he, as he saw Jemmy's shirt like a V turned upside down on his back. "Why," said Jemmy, "when I made the jump, as I came down some hooks caught the tail of my pea jacket and hung me like a sheep's carcase in a butcher's shop, I tried to unbutton it but couldn't, they was so plaguy tight, and when you gave me your knife I put my hand behind and gave the jacket a small cut when it ripped right up, and down I went plump into a wet ditch, a berth I didn't bargain for, howsomever I gets up, and thinking to circumwent the enemy, I struck off a little to the right and got sight on him, and getting a big tree between us I kept them in one and crept towards him, and when I gets to the tree I looks round and there I sees," here he began to laugh, and my father was afraid he would be heard, and gave him a dig in the ribs that took his breath away and stopped his laughing. "What was it, you long fool," said my father. "Why," said Jemmy, almost giving way again, "a young Jackamorass at single anchor by the heels and cruizing round his anchor."

My father then returned to the captain and reported that all was quiet; the captain had not been idle, for he had removed three of the planks of the fence which left a sufficient space for a person to get through easily, the planks were laid across the wet ditch to form a bridge, and the Jacob's ladder was rolled up and stopped.

Just after my father rejoined the captain they heard one bell (half-past twelve) strike on board the ship, and immediately after

a light appeared at a window abreast them. "All right," said the captain, "you two follow me and make no noise, Kennedy, you take the ladder." Half way towards the house he told the other man to stop, and my father and the captain went up to the house under the window at which they had seen a light; the captain then gave a low whistle, and my father heard a sound like a window going slowly up, which indeed it was, for a head came out and a voice from the head which trembled as it said, "I'm all ready, William." "That's right my darling, look sharp," said the captain. "Here she comes, sir," whispered my father, "hand over fist," but instead of the young lady it was a valise, which was unbent and the line that sent it down bent on to the Jacob's ladder, which was slowly hauled up; after a little time the head again appeared, and the voice said tremblingly, "Oh, William, I'm so afraid, I cannot get down." "I'll come and help you, my love, don't be alarmed, steady the ladder, Kennedy," said he. "Aye, aye, sir," said my father, and up the captain ran, but just as he got to the window the lower part of the ladder began to slacken, it came quicker and quicker, then came a sudden jerk and the captain was on the broad of his back on the ground. The young lady had made the line which held the top of the Jacob's ladder fast to the bedpost, which held it until the weight of the captain became almost direct, but being on castors, the bedstead began to move, and with accelerated speed, until it reached the window where it was brought up, and the sudden jerk threw the captain off; there was a faint scream and the window was suddenly shut. "Are you hurt, sir," said my father, but there was no answer. Just then the man who was left half way, having heard the noise, came up and making a kind of hammock with the cloak, they lifted the captain up and carried him away. Just as they got him through the fence, a window was thrown open and a voice, decidedly not the young lady's, called out, "Who's there, if you don't stand still I'll fire." "Fire away and be blowed," whispered my father, "go on, Bill, steer for the white handkerchief," which they fortunately hit, and laying the captain down they gave a one, two, three, and haul, and out came the portion of the hedge; they then carefully lifted the captain over, and laying him down again, had another good haul at the spunyarn which filled up the gap, so that it could not be seen, they hurried across the road and to the heath among the furze bushes just as they heard voices in the shrubbery they had left: the man at the top of the cliff seeing them coming went to meet them, and thinking they were carrying the lady said, "Bring her along, boys, but where's the captain?" "Hold your confounded tongue," said my father, "and lend a

hand;" with some difficulty, for the clay cliff was very slippery, they got to the boat and placing the captain in the stern sheets, shoved off.

When at some distance from the shore they stopped, and my father asked for the lantern to examine the captain, but the man had left it on the cliff, he however sat him up, and a groan told my father that he was not dead, so searching the basket the steward had put in the boat, he found a bottle of brandy, and believing that to be a cure for all evils, he poured about half a tumbler down the captain's throat. It evidently had some effect, for the captain began to gasp for breath and then laid his head down on the boat cushion that had been placed under it. "What have you done with Long Jemmy," said one of the men. "Long Jemmy!" said my father, "is'nt he in?" "I thought I missed something, he must run his chance, for we cannot go back with the captain in this state, so give way on board," and they did give way. The first lieutenant was on the gangway, a whip was on the main yard and a chair slung to hoist the young lady in, but it hoisted the captain in instead, and the surgeon was sent for, who soon said that there was no danger, the captain had, in falling, struck his head on the sill of the window below, which had cut it and stunned him, and my father had innocently caused a continuance of his insensibility by administering the brandy.

When the hubbub was over, my father went and reported to the first lieutenant all that had happened, and also that they had left Jameison on shore. At that the first lieutenant pulled a long face and said, "Very well, Kennedy, it cannot be helped, but you must shove off again and look for Jameison, and you must look sharp, as we unmoor at four o'clock." My father went off and pulled into a spot some distance to the right of the cove, and then pulled slowly along, skirting the shore, stopping occasionally to whistle three times, all was quiet at the house on passing, and at some distance to the left, when off a point of rocks, on stopping to whistle, a voice answered, "all right, pull in here," and in another minute they had Long Jemmy in the boat and were pulling back to the ship.

Jemmy had kept watch, as ordered, undisturbed until he heard the challenge from the window, and thinking something was going wrong, crept back round the fence, and was passing the spot where he had left the captain, when a man jumped through the fence, and calling out, "here's one of the thieves, sir," caught one side of the tail of Jemmy's pea jacket as Jemmy started to run past, the portion by the collar untorn snapped and peeled the sleeve off, leaving Jemmy free and his would-be captor on his back, but he was up in

a moment, and joined by another, went in full pursuit, but Jemmy had got the start, and his long legs stood him in good stead, he soon distanced his pursuers, and then suddenly stopping and crouching under a furze bush allowed them to pass, and then quietly walked back past the house, and finding the boat gone, he went on a little distance and then lay down until he saw the boat.

Jemmy had no doubt distracted the attention of the party who had been following the captain, and enabled him to get away.

My father got back to the ship just as the hands were turned up to unmoor ship, and by daylight the ship was sailing out of the harbour.

My father never heard more of the young lady, but although not successful, each of the crew got his guinea and my father two. I have often heard him say, that if asked his choice to go on a cutting out expedition of a young lady or an enemy's ship, he would prefer the latter—perhaps if the cutting out the young lady had been on his own account he would have been of a contrary opinion.

Jameison kept his half jacket as a trophy, and the captain gave him a new whole one.

Chapter IV.

My father's journal of the year 1797, the year of the mutinies at Spithead and the Nore, was not given to me, but I have every reason to believe it was regularly kept, and that he destroyed it, how far therefore, he was implicated in either I have no means of knowing. In the beginning of the year 1798, he was in the *Clyde*, 38-gun frigate, and in April was one of the inshore squadron off Brest. On this harassing duty of watching the enemy's fleet, they were frequently under the fire of the forts, the shots from which generally went over them, but all their inducements of standing close in, failed to bring the enemy out—which was tantalizing in the extreme.

On the 13th January, 1799, while blowing very hard, a brig was observed lying to under storm stay sails: they ran down to her, fired a gun and hoisted French colours, and the brig hoisted the American ensign; they hailed her and enquired where she was from, the answer was Plymouth, but Captain Cunningham not being satisfied made her come under the lee, boarded her, and discovered her to be a French privateer of fourteen guns; the weather being thick and hazy she had not time to make sail to

effect her escape before she was under the guns of the frigate, but the captain of the privateer sent all his men below, hoping to deceive the *Clyde*, not thinking they would attempt to board him as it was blowing so hard. The prize had the crew of an English merchant brig on board which she had captured the day before, who were as much astonished as pleased at their sudden release. The prize was manned and, with another captured two days before, taken into Plymouth.

On the 4th May, when at anchor with the squadron in Quiberon bay, several vessels were observed stealing along shore, and the commodore made the signal for the *Clyde* to weigh anchor and chase, which she did; but on the approach of the *Clyde* all the vessels ran on shore, the *Clyde* then stood as close in as the depth of water would permit, tacked, hove to, and hoisted out her boats, for the purpose of sending them in to destroy the vessels. As soon as the French became aware of their intention, the forts brought some guns to bear and opened a brisk fire on the boats as they approached, my father was in one, and said the shot were dropping like hail around them, one passed so close over him that he bobbed his head down, but all the damage it did was to carry away the mizen yard: they succeeded in setting fire to the whole of the vessels and returned to the ship without the loss of a man.

As an exemplification of the simple truth and modesty with which my father recorded his adventures in his journal, I have extracted verbatim his account of the well known action between his ship, the *Clyde*, and the French 36-gun frigate *Vestale*. After the date 16th August, 1799, it runs: "Several days passed without "anything particular happening till the 20th of the month, when in "the morning we saw two large ships and gave chase to them, the "weather fine. They both looked very dubious, but at length, they "finding that we came up with them and had a mind to fight them, "both made sail on different tacks; we chased the largest and after "some time, came up with her and fired a gun at her, and at the "same time hoisted English colours; she soon returned the salute "and hoisted French colours: then a smart engagement commenced "and lasted two hours and forty minutes, after which time she "struck to the *Clyde*. Her name was *La Vestale*, a French frigate of "thirty-eight guns: we had four men desperately wounded, and one "of them died under the operation of cutting off his leg at the thigh. "We began to change men and to put the ships in a condition fit to "go to England: the French ship had twelve men killed and twenty-"five wounded, she was a perfect wreck, but we put her to rights "a little before night and made sail for England. The next day

"another man died of his wounds. We got our prize to rights, masts "fished and sails shifted, and took her in tow. On the 23rd a third "man died of his wounds. On the 25th, weather clear, saw three "men-of-war to windward, supposed them to be French, but not "finding ourselves in a condition to engage did not speak them, but "still kept on. Monday, 28th, came to anchor in Plymouth Sound, "our prize went up the harbour."

I need scarcely say that in his family, my father was more free in his account of the engagement than he was on paper in his journal. The *Clyde* had been off Rochefort and had worked off shore, when in the early morning they observed the two ships to leeward, and the hands were turned up to make sail; soon the ship was under studding sails, lower and aloft, and my father in describing the excitement on board often burst out with the old song—

"Eight bells had struck and the starboard watch was cal-led,
And the larboard watch they went to their hammocks down below.
Before seven bells, the case it was quite alter-ed,
And broad upon our lee beam we spied a lof-ty foe.

"Up hammocks and down chests,
Oh, the boatswain he piped next,
And the drummer he was called, at quarters for to beat.
We stowed our hammocks well
Before we struck the bell.
And we bore down upon her with a full flowing sheet,
And we bore down upon her with a full flowing she-e-et.

"For four hours we did engage
Like bold Britons in a rage,"
etc., etc., etc.

and although they were not engaged for four hours it was "not child's play" while they were about it.

It was not until between five and six bells in the forenoon (half-past ten to eleven) that the strange sail were made out to be enemy's frigates, and the question was whether, having the weather gage, our captain would attack two of them? but there was not much time for doubt, for Captain Cunningham who had gone up on the fore yard with his long glass, resting it on the collar of the fore stay and taking a long and steady look, suddenly called out to the first lieutenant, "It's all right, Kerr, we can manage both, beat to quarters," a half murmured cheer ran fore and aft as the drummer beat to quarters, and all were at their stations. The doctor and his mate expecting plenty to do, got all their implements out in the

cockpit, and the young doctor's mate, anxious it may be supposed for a job, with his coat off would every now and then push his head up from under the fearnought screen and calling out to my father, who was captain of a main deck gun, "Weel, Kennedy, my braw lad, and when are ye gaun to begin," and my father would answer, "Very soon now, sir; if we overhaul them as we are doing now, you will soon have plenty of work."

It was evident, either that the enemy were going to fight and that together, or that they did not make us out, but when we got within about a couple of miles of them we saw a signal go up on board one of them and then they bore up, made sail and went off on different courses, on seeing what they were up to, there was a feeling of great disappointment, and the captain stamped with rage, but shaped the *Clyde's* course at once for the largest: at half-past one the colours were hoisted and a bow gun fired, on which the Frenchman rounded to, hoisted her colours, and fired a broadside. After that, my father remembered but little, the excitement and work during an action admits of no time for thought, anything that occurs in the immediate neighbourhood of his own gun may be hastily noticed, but it does not extend beyond the second gun on either side, thus soon after the action commenced, a shot came through the side near my father's gun, which took the leg clean off one of the men who was at the train tackle of the next gun, and my father told one of the men to help to carry the wounded man below, and as he was about to do so, a splinter struck him in the arm and shattered it at the elbow, such are the strange accidents in a fight.

My father said that he thought the action had only just commenced when the order was given to "cease firing," and to his astonishment he found they had been at it for two hours, and that the French frigate had struck her colours.

My father was one who was sent to transfer the prisoners, and conveyed the captain (his name was Pierre Gaspard) from his own ship to the *Clyde*. Captain Cunningham received him on the quarter deck, and shook hands with him as cordially as if he had been an old friend instead of a late enemy. The French captain was a brave man, for he had ordered the other frigate, the *Sagesse*, to part company that he might fight the English frigate single handed; it was supposed that he had mistaken the *Clyde* for another and smaller vessel and that she, having the weather gage, would decline the action with the two.

The *Vestale* did not strike her colours until her masts and rigging were cut to pieces, and the hull riddled in all directions; she had a dozen men killed and twice that number wounded.

My father was one of the prize crew, and all had to work hard, night and day, to make the ship seaworthy, the seamen at the rigging and sails and the carpenters stopping shot holes, and, as recorded in the extract of his journal, the two ships arrived safely in Plymouth Sound.

(To be Continued.)

MARINE STEAM ENGINES.

HINTS TO MASTERS AND MATES. No. I.

In the present case it is not intended to give a history of the steam engine, nor is it intended to give the names of those great men to whom the world is indebted for the conception, improvements, adaptation and development of this great civilizer of the human race, this now indispensable machine; nor is even our intention to give so much as the rules by which the construction and proportion of the various parts of engines and boilers are regulated, our aim is now to state, in a short and simple manner, free from technicalities and technical obscurities that which may be found useful to nautical men and others who are not engineers by profession or education, but who may still be in some way or other connected with engines and steamships. The best and readiest way will be to take each part of the boiler and engine separately, and to point out its main construction, and to explain the uses for which it is designed, and where necessary the best ways of working it; we begin with the boiler.

The *Boiler* is the generator and reservoir of the force or power, which works and controls the engines, and may as well be taken in hand first. It contains the water, to which heat is applied for the production or generation of steam, and is of various forms and construction, according to the position it is to occupy in the ship, the nature and duration of the services in which the ship is to be employed, the size of the ship and the fuel to be consumed in the furnaces. Those who are intrusted with the design of the boilers and machinery must decide what boiler shall be used. Special boilers are used for special services and special classes of ships, but the boiler found to work best as a common servant is the tubular boiler, and that is the description of boiler most in use.

Shell. The shell is, as the name implies, the outside portion or the

case of the boiler. It is in many cases of a nearly rectangular and rectilinear form, that is to say, its sides form almost right angles, and are almost flat. Some shells have an hemispherical or round top; the shells of other boilers are circular (which is the best form and that generally used when a high pressure is required) with flat ends. The shell of a boiler is made of wrought iron plates from about three-eighths to about one inch thick, and the parts are fastened together with rivets; the holes to receive the rivets are punched or drilled, which is better, in the plates. The rivetting ought to be done in such a manner as not to crack the plates. It is also very important that the holes should be punched or drilled in a direct line, and be made equally distant from each other, and that the holes in any two plates to be joined together should be alike in size and place, so that when one plate is laid on the other, previous to rivetting, the holes in the one plate may be fair with the holes in the other; if they are not fair they are "blind" or partially "blind" as boilermakers term it. To make the joints along the edges or corners of a boiler, the plates must be bent or angle iron must be used; when the flat sides or end plates of the shell of a square boiler are not bent so as to be united with the bottom or top of the shell or *vice versa*, angle iron is used for the purpose, when this is done holes are made in the angle iron corresponding with those in the plates, and the two are rivetted together in the same manner as two plates are rivetted. Some makers prefer using angle iron, others avoid it if possible. In many cases no doubt the plates bent so as to form a joint, afford the best and cheapest method, for there is a saving of the angle iron and nearly its weight, and of the workmanship on it; there is also a saving of one row of rivets, consequently there is one seam the less to leak, and leaky seams and rivets are highly injurious to boilers, more particularly in the bottom of the shell where a leak cannot generally be got at to be put right after the boiler is once fixed on board the ship. In such a case the boiler must be lifted, and this entails great expense, requires great care, and consumes much time; care should therefore be taken in rivetting all parts of the boiler properly, and in having the rivets of the proper size and length, of good and suitable iron, and heated to the proper temperature. When finished, the rivets should fill the rivet holes and a sound and sufficient head should be left. If these things are not attended to, the result will be that when a strain is applied leaks will take place, the plates will be easily separated, and the outside of the plates will become corroded when the water and steam get to them.

Furnaces. The furnaces contain the fire, they are inside the shell and may to a certain extent be said to form part of it, although they

do not form part of what is generally understood as the shell. The size and number of the furnaces to a great extent depend on the size of the shell, but it is well to have good sized furnaces, so as to give a large fire-grate surface, and therefore a large heating surface. The power of the boiler, that is to say its capability to generate or produce steam, depends much on the size of the furnaces and of the accompanying grate surface. The iron of which furnaces are made ought to be of the very best quality. The crowns and sides being subject to the immediate action of the fire, are when made of the best iron apt to buckle and crack, and if not made of the best iron are sure to do so; although as a rule it is desirable to have large furnaces, they ought not to be made large at the expense of the water spaces, for if the water spaces are too narrow, the furnace plates will certainly get buckled and cracked, and difficulty will be experienced in removing incrustation from them and the adjacent plates. About one square foot of fire-grate surface to about twenty or twenty-five square feet of heating surface will be found to give good results.

Water Spaces. The inside of a pail or bucket is the water space of the pail, or the space that holds the water, and so the water spaces of a boiler are the spaces holding water in it, such as the space between the side of one furnace and the side of the next furnace, or between the side of one furnace and the side of the shell of the boiler, or between the plates of the combustion chamber and the shell of the boiler, etc. From about six to seven inches will be found to be sufficient water space in most cases, but the space may with advantage be slightly increased between the bottom of the ash pit and the bottom of the shell of the boiler, so as to facilitate the removal of the mud and deposit, etc.

Ash Pits. The ash pit is that portion of the furnace which is below the fire-grate surface and contained within the shell of the boiler, except in the case of dry bottom boilers; the ash pit ought to be of good depth so as to allow sufficient air to get at the fire through the spaces between the fire bars; unless this is the case, too slow and very imperfect combustion will be the result, and this imperfect combustion will be accompanied by waste of fuel.

Combustion Chamber. The combustion chamber is the chamber through which the gases and flames pass before entering the tubes; it is situated at the end of the furnace or furnaces opposite to the furnace doors. The plates which form this chamber ought to be of good quality, as they are subject to the direct impact of heat and flame. The height of the combustion chamber is regulated by the size of the tube plate. It should have an area at its bottom of

about one and a half of the area of the tube ends, and it will then in most cases be found to answer well.

Tubes and Heating Surface. The flame after leaving the combustion chamber passes through the tubes into the up-take. The flame therefore passes through the length of the boiler twice, viz., once from the front to the combustion chamber at the back, and again from the combustion chamber through the tubes to the up-take in front of the boiler. The tubes are generally made of wrought iron, although sometimes of brass, which is more expensive but lasts longer. Brass is objected to by some engineers, from the injurious galvanic effects it is said to produce when placed in conjunction with iron. The tubes heat the water by which they are entirely surrounded, the heat and flame passing through them. The tubes are generally about three inches in diameter, and are placed above the furnaces, and ought to be sufficiently far from the furnace crowns, to admit of a man or at least a boy getting into the boiler between them and the crowns of the furnaces; they are generally placed so that there is a slope downwards towards the back end of the furnaces.

The slope varies, but about one inch to every foot in length will be found to answer well. If the heating surface of the tubes and plates taken together be from about twenty to twenty-five square feet for every square foot of fire-grate surface, and the boiler be in other respects well constructed, a satisfactory result ought to be obtained. As has been explained, the heat and flame generally pass through the tubes, but sometimes this is reversed, and the water is in the tubes, and the heat passes round them and outside of them.

Tube Plates.—The tube plates are made of thicker plates than those forming the shell of the boiler, and are generally of iron, although in some cases the back one is made of copper, and is considered by some to answer better than iron. Holes are bored in the tube plates of the same diameter as the tubes, or very slightly larger; the tubes, after being cut a little longer than the distance between the outside faces of the tube plates, are put into holes and expanded or drifted out, so as to fill the holes in a perfectly steam-tight manner. There are various ways of doing this, all of which methods have some supposed advantage or disadvantage, one maker prefers to adopt one plan, while another of equal merit adopts another; in which ever way it is done great care and judgment must be exercised, otherwise the tubes will get split and cracked at the ends.

Up-take.—The up-take is that portion of the boiler which leads to

the funnel, the smoke and heat passing up through it after they have passed through the tubes. The up-take passes through the steam space in the upper part of the boiler, and the heat which has not been absorbed in its passage through the tubes, therefore serves to dry the steam in the steam spaces, and if there is a superheater, superheats it more or less in accordance with the quantity of heat still left to be absorbed, and the construction of the superheater. Of course the less the quantity of heat passing into the funnel the more perfect is the absorption of the heat by the water which surrounds the tubes, and the other heating surfaces with which the heat and flame come into contact, and the less is the waste of fuel.

Superheater.—The superheater is placed in the up-take, is of various constructions, and serves to give more heat to, or to superheat, the steam on its passage from the boiler to the engines. The superheating of steam depends, more or less, on the amount of heat available for superheating, and the construction of the superheater. Various opinions exist as to the advantage of superheating, and it has been to some an expensive experiment; but there can be little doubt that where the superheater is simple and well-constructed, and judiciously managed, good results may be obtained. It has been ascertained that if the steam is superheated much over 300°, the effect is injurious to the packing in the stuffing-boxes, and to the working parts of the engines that come in contact with the steam. They should be so constructed as to have a sufficient number of doors, that they may be thoroughly examined, and should have a drip-pipe or cock to drain off all the condensed steam, etc.

Steam-space.—The steam-space is that portion of the boiler, above the water-level, where the steam accumulates. The steam-space, therefore, forms a reservoir for supplying the engines with steam, and ought to be of sufficient capacity to meet the demand of the engines, and in proportion to the other parts of the boiler. When the steam-space is too little, priming will be the result. About one-fourth of the total capacity of the boiler has been found to answer well as a steam-space.

Manhole doors.—The openings of the manhole doors ought to be of sufficient size to allow an ordinary sized man to get into the boiler so as to clean or repair it; there is always one in the upper part of the boiler, and one or two generally over the furnaces or water spaces between the furnaces, although the latter are often only large enough to admit a boy, The doors generally fit, and ought to fit inside the boiler, and are secured with cross bars called dogs, and bolts and nuts, having gaskets with white or red lead

between the gasket and the door, and between the shell of the boiler and the gasket. All manhole doors ought to be strengthened by a wrought iron ring, and upon no consideration ought cast-iron to be used for such purposes, and the doors ought to be made of wrought iron.

Mudhole doors.—The openings of the mudhole doors ought to be placed so that the mud and scale can be easily removed; there are generally two or three according to the size of the boiler, and are generally placed at the front of the boiler near the bottom. The size of the mudhole door is generally regulated by the size of the water space and form of ash pit, one or two at the back end of the boiler are found to be very useful when cleaning and repairing takes place. The mudhole doors are secured in the same way as the manhole doors, and when the openings are large ought to be strengthened by rings similar to those at the manhole door openings. All doors should be made of wrought iron.

YACHTING AND ROWING.

Since Mr. Ashbury *will* insist on playing the part of an international yachtsman, we must, even at the "risk of" being included in the list of his thick-and-thin admirers, give him an occasional line in our log. This has been a busy month. The University Boat Race has been lost and won—right gallantly. Canada and England have signed articles to row another four-oared match again, at the other side of the Atlantic, and last, though by no means least, the schooner yacht *Livonia* has slipped safely from the stocks. Times were when such a circumstance as this would have merely excited "the rustic cackle of the bourg" wherein it occurred, but we and the Yankees have changed all that. When a wealthy British commoner is penetrated with those feelings of patriotism, which very properly actuate the late owner of the *Cambria*, it is simply fair that the launching of his newest nautical toy should be circumstantially noticed by the press—should excuse solid pages of learned criticism in country gentlemen's newspapers, and even bring forth a solemn "report" in the leading journal itself. And indeed after all the *Livonia* is something more than a mere toy. She has been built to avenge Bunker's Hill—or in other words to wrest the cup which our clever cousins won from us in 1851, with the aid of the sailing

machine *America*. A cup at present held against all comers, under certain stringent, and Mr. Ashbury is disposed to think somewhat prohibitory, conditions by the New York Yacht Club. So much for what may be termed the popular view of the new vessel. There is another and to the public a scarcely less interesting view, one also of the first importance to the entire yachting community, we mean that which has special reference to her build. The *New York Herald*, scarcely a dispassionate witness by the way, asserts that the *Livonia* is nearly a copy of the *Sappho;* but this is not the case. Mr. Ratsey, the builder, has succeeded, all practical men who have seen the vessel avow, in turning out a yacht which embodies all the good points of an ordinary English racing yacht, and of an ordinary American keel racing yacht. The peculiar merit which the Americans claim for the *Sappho* is certainly not of Yankee origin. As a writer in a well-informed weekly journal has shown, the midship section of the *Livonia*—the particular portion of the design alleged to have been copied from the *Sappho*—was "embodied in the *Espiegle* (one of our sixteen-gun brigs, designed years ago by the School of Naval Architecture), and the well-known cutter *Christabel*, and a clever little ten-ton craft (the *Magic*) built on the Mersey." He furthermore revives a circumstance that our American relatives would do well to remember in their anxiety to claim the *brains* of the *Livonia* to themselves. The *Sappho* which returned to America was no more like the yacht of that name which was beaten in the race with the *Cambria* and others round the Wight, than an after dinner speech in England from Commodore Bennett is like "a communication" from that gentleman in his own paper, the *New York Herald*. The "smartness" of the Americans is proverbial. When Mr. Fish was beaten in 1868, he set to work to alter the *Sappho*, and so thoroughly did he accomplish his task, that in 1870 she experienced no difficulty whatever in literally "walking away" from the *Cambria*—a vessel just about half her size. Let there be no confusion of terms. If, speaking on behalf of the owner of the *Livonia*, we are to answer to the charge of copying the *Sappho*, let us know which particular *Sappho* is meant; she of 1868, the failure—or she of two years after, the success? But to revert to the *Livonia*.

The writer in the *Field* (whom we take to be Mr. Dixon Kemp, Mr. Ashbury's *Compagnon du Voyage* in the memorable match between the *Cambria* and *Dauntless*) has entered so thoroughly into the task allotted him, there is nothing left for us but to follow here and there his lead. We question whether a vessel was ever described with such painstaking care before. Like the enthusiastic actor who was deputed to perform "Othello," he has blacked himself all over for

the part. To begin with, the *Livonia* was launched on Thursday, the 6th ult., from the yard of Mr. M. Ratsey, Cowes. The immersed portion of the rectangular form described by her extreme dimensions is much more cut away than was ever attempted in a large vessel in this country before. The part immersed is a combination of the high buoyancy and low gravity principles, and, shrewdly observes Mr. Kemp, "it remains to be proved how far it will be successful." In carrying out his ideas so as to modify the *Sappho* model, the builder has managed to keep the tonnage down more than 100 tons below the "original," than which the *Livonia* is 2 ft. 6 in. less in beam and 2 ft. less in length over all. The loss of structural stability by her lesser beam is more apparent than real, as she carries her bearings further fore and aft than the *Sappho*. Moreover she has a greater dead rise and is thus able to carry her weights where they are of most value. By having less beam she gains in fineness of water lines. Her length of load line is the same as the *Sappho's* and she has much less freeboard and lower bulwarks than either the *Sappho* or any English yacht of approximate tonnage. The tonnage of the *Sappho* is 394, that of the *Livonia* 280. She has no square topsail but a spinnaker. The foresail is smaller in proportion to the mainsail than usual. She has been built in the strongest manner, and her floor timbers are of iron, her internal fittings are simple, and she has less accommodation below than most English yachts. Such is the picture in little, reduced from a sketch (drawn by no unfriendly hand the reader may be assured), of a vessel whose future career will be scanned as keenly on one side of the Atlantic as the other—a vessel that is destined, Mr. Ashbury is not alone in hoping and believing, "to lick creation." It will afford *us* considerable pleasure at any rate, to have to chronicle her triumphs.

Although New York yachtsmen are persuaded that the American cup is pretty certain to remain at the other side of the Atlantic, so long as vessels of the *Enchantress* and *Dreadnought* type are turned off the stocks, some of them are not insensible to the advantages which accrue from a well-made match, and to clear the way for signing articles that will be about two to one in their favour, those astute New Yorkers have actually gone to the expense of obtaining counsel's opinion to convince Mr. Ashbury that, since he will essay to recover the much-coveted trophy, he must be prepared to sail single-handed against the whole American fleet! Now it may be that the conditions under which Messrs. Schuyler, Beekman, Wilkes, and others presented the cup to the New York Yacht Club, admit of the interpretation which "counsel" put upon them (we dare say, Mr. Ashbury could have obtained a contrary

opinion if he had chosen to pay for it), but it seems to us that they are likewise *susceptible* of being understood quite the other way. A match well-made is half won. The New York Yacht Club appear to be aware of the force of the proverb. Mr. Ashbury wants to sail his yacht against the *best* vessel in the American fleet. The N. Y. C. say "No; if you sail at all, it must be against as many of our yachts as we choose to enter." The owner of the *Livonia* is keenly alive to the disadvantages which would attend such an arrangement. He knows he would be handicapped by it, and he wants to start fair. And so there the matter rests for the present. Whether the cup which was won on the 22nd of August, 1851, will ever be brought back again, time alone can show. It seems to us though, that to achieve success the *Livonia* will have to prove herself as much superior to her opponents in speed and weatherly qualities as the *America* was over her English adversaries twenty-one years ago.

We have intelligence of several new yachts that are likely to hold their own in the matches of the present season. The Clyde, which has already gained an enviable reputation by the yachts *Oimara*, *Fiona*, and *Condor*, will shortly turn out a cutter which bids fair to add to the fame of the builder, Steele, of Greenock. She is 98⅓ tons, and will bear the name *Garrion*, after a Scottish stream. She will be "tried" in one or two of the Channel matches at the commencement of the season. The *Lallah Rookh* schooner and the *Nyanza* have been taken on to Steele's slip for a thorough overhaul. In the yard of Messrs. Connal, of Whiteinch, near Glasgow, a twenty-ton cutter is building for Mr. J. N. Forrester. She has been designed by Mr. F. Powell, of Dunoon, owner of the schooner yacht *Aglaia*, and will be named the *Zampa*. Reid is building a twenty-ton boat in his yard at Port Glasgow, but there is nothing about her to call for special remark. At Fairlie, there has been little doing during the winter, and with this observation we may for the present close accounts with the Clyde.

Cowes, the headquarters of the yachting world, is "all alive," actively bestirring itself with a view to commencing what promises to prove a most successful season—wind and weather permitting. Ratsey has his hands full. The *Day Dream*, which he is building for Colonel Lloyd, and the *Harlequin* for Colonel Markham are in a forward state, and one of them, the *Day Dream*, will shortly be launched. The *Day Dream* is a yawl of 90 tons, and is intended for cruizing; but the *Harlequin*, it is expected, will take her part as a racer. She is a schooner of 99 tons. The *Foxhound*, cutter, 35 tons, belonging to the Marquis of Ailsa, is being fitted out for

racing. Count Batthyany has commissioned Ratsey to build him a cutter, but the size, etc., of the vessel have not transpired. Several yachts are on the slips for overhauling and refitting, and "when our report left," others were expected.

The rest of our items of home yachting news are, individually, of scant importance. The Annual Meeting of the Royal Welsh Yacht Club was held at the Club House, Carnarvon, on the 6th, when some additions and alterations were made to the Club rules. The chief of those was this: "That in future there shall be no restriction as to canvas, and that booming out shall be allowed." Mr. G. Rees having, much to the regret of the members, retired from the Honorary Secretaryship, Mr. C. Jones was elected in his place. The Club Regatta is fixed for August 7th, and the opening cruise for the 23rd of next month. At the ballot meeting (for April) of the Royal Thames Yacht Club several new members were elected, including Mr. John Shapland, of the schooner yacht *Iolanthe*, 84 tons, and Mr. Charles T. Luck, of the *Magician* yawl, 64 tons.

The R.T.Y.C. will give a dinner to Mr. Ashbury, on Wednesday, the 3rd of May. We may add to our group of jottings a notification of an International Regatta which is announced to take place at Gothenburg, early in August, under the patronage of his Royal Highness Prince Oscar. Sweden is coming out!

In spite of the gallant race between the University eights being by this time a more than thrice-told tale, we feel sorely tempted to give *our* version, *our* theory, and *our* description of a struggle that will not soon be forgotten by those who were fortunate enough to be there. Indeed, those who were not present, who in town had to look to Edgington's capitally contrived flag signal for the earliest announcement of the result, will long remember their triumph, or disappointment, according to the particular shade of blue which they affected. It would be easy to occupy a dozen pages with reflections and what not on the boat race; but space is precious, and we must be temperate. A very learned gentleman, writing in the *Pall Mall Gazette*, on the night before the race, proved by the most convincing line of reasoning that Cambridge could not possibly win. The "catch" of Oxford would beat the "snatch" of Cambridge, notwithstanding the undoubted roughness of the former crew, as it had done twelve years before. It would be sheer cruelty to dwell longer upon that never-to-be-forgotten article. Its ineffable stupidity was quietly exhibited to the world on the following day by the inexorable logic of facts. Indeed, we should not have made the least reference to the disquisition if we had not chanced to know

the writer to be an amateur sculler of considerable celebrity—the champion of his year. Of all the newspaper writers that have dealt with the race, but one has laid adequate stress on the difference between the boats. Our own impression, when we saw the crews at practice, amounted to this: Given equal skill and capacity to stay on the part of both crews, the "ship" with which the Cantabs had been fitted by Clasper was just good enough to win the race. And herein note one important fact. The structural distinction between the Salter and the Clasper was in itself almost sufficient to account for the apparently lengthy stroke of the Oxonians, as compared with the seeming want of length in the Cambridge boat. We attach less importance to that "catch at the beginning," *per se*, about which so much fuss has been made, and therein cordially agree with Mr. Gulston, a rower whose opinion, founded as it is on a riper experience, carries greater weight than that of Mr. Darbishire, highly as we esteem the stroke who carried the Four to victory in the Oxford-Harvard race. In the boat built by Clasper the seat of the coxswain is half a foot lower than in the Oxford boat; the seats of the men also are placed low, and consequently their work is low. The fact that the stretchers are fixed in permanently, and that the bars across the boat are made of wood and not iron, renders the ship at once lighter and stiffer. In the Salter the thwarts are high and the work close to the man, thereby giving no end of a help in the reach forward. In the Clasper, on the other hand, with the thwart low and the work a long way off, it is next to impossible for the men to get so far forward as in the Oxford boat. The Dark Blues rowed a plucky, stern race, but they were beaten. The better crew in the better boat practically demonstrated their superiority. We might, if we chose, say a good deal more about "style" and "form" as regards the rowing; but not only has the subject been already "done to death," but we hardly think the readers of the *Nautical* care to trouble themselves much about such mysteries.

We learn from *Wilkes's Spirit of the Times* that the Harvard Boat Club has at last responded to Yale's challenge [Harvard and Yale are the Oxford and Cambridge of America], but is inclined to supersede the usual university race between those two colleges by reviving the Union College regatta, which was tried a dozen years ago. The response of Harvard is that it will be ready to engage in a six-oared three mile straight away race on the 16th of July, provided fair play and honourable dealing can be assured in advance to all parties [this clause would be highly impertinent in any English "articles" for a match between gentlemen], and provided that all American colleges should be allowed to enter crews for the race. A

day is appointed for the meeting of delegates in Springfield, to talk the matter over, and if possible agree upon definite rules and regulations for the contest. "If possible!" After this one ceases to marvel at the speech which one of the Harvard crew made on his return to America.

A match will be rowed for £500 aside between R. Fulton and three oarsmen of St. John's, New Brunswick, and James Renforth and three English oarsmen, on the 23rd of August next, on the Kennebeccasis river, near St. John's. The course will be six miles in length, three out and three home. Renforth has not yet decided upon his crew, but we believe that Harry Kelley will form one of the four.

THE GROTESQUE AND THE SOLEMN.—GRAINS OF WISDOM EVEN IN NONSENSE.

How often it happens that some whimsical movement of the fancy, some odd, strange recollection, some wild vagary of thought, will intrude into solemn experience, and mix with the sad and the serious in the most startling and abrupt way. It would seem as if there lay in the mysterious pathway of the human mind fragments of nonsense analogous to those cosmic substances which, lying here and there in space, come now and then within the sphere of the earth's attraction, and disperse incandescently as shooting stars. So, perhaps, do the floating follies of fancy or of memory impinge upon the mind in the course of its travels, and the contact gives rise to heterogeneous lights, sparkles of seeming absurdity. How often does a line out of some comic or humorous song, or strange expression heard in the street, come into the mind as a sort of burthen or refrain, even when the thoughts are intent upon a topic in no way related to the intrusive words. Many men of earnest piety must remember occasions when, even in the midst of their morning and evening prayers, the most ludicrous images presented themselves, and laughter almost broke out into rude disturbance of praise. Some have reproached themselves with this as deep sin; but we incline to think that it is by no means so awful a matter as that, and that if we only knew a little more of the laws of associated ideas, we should be able to explain these

grotesque phenomena without resorting to such dreadful hypotheses as innate depravity, demoniacal suggestion, and other horrors of that type. But though there is nothing, in our judgment, very wicked in these mental oddities, they now and then visit us a little inconveniently, and are sometimes outrageously disregardful of time and place. In a place of worship, for instance, one would like to be decorous and composed, to feel solemn associations with the place, toned with the cheerful and the sweet, but not coloured with the comical and the droll; and yet, in spite of ourselves, the droll and ridiculous will enter even there. Nay, there is sometimes in parts of the building itself express provision made for amusement and the tickling of the fancy. In several of our old cathedrals the eye cannot wander far without falling on some quaint corbel, some frieze or spandril, telling some absurd mediæval story,—some coarse, but human face, grinning from ear to ear; some nondescript beast jumping and snarling out of the stone, like a dog from its kennel; some spooney-looking saint or bolster-legged cherub, some satiric or humorous touch in wood or stone carving, by which the monkish artists of old expressed—not their spiritual ecstacies — but the common sentiments and passions of their humanity.

Of odd and comic recollections intruding abruptly into a state of sad and solemn feeling, most readers will be able to recall many instances. It is now about thirty years ago since we returned from a sojourn in the north of Europe, by Gothenburg steamer, to Hull. The weather when we started was not without some cheerfulness, for though there was abundance of cloud, yet it was not on the whole dark cloud; it consisted of rocky cumuli, moving over the skies with great rapidity, and breaking open now and then to admit bursts of splendid sunshine. But there was wind in terrible superfluity. One sailor called it an uncommonly stiff breeze; another said it was "half a gale;" another that it blew "great guns;" but none of them were at all surprised, they had seen such things many times before. To us who had had no nautical training, and very little experience on the sea, the wind seemed terrific. The packet quivered and rolled, flew forward, flew back, started, stood still: scattering the foam from her bows and paddles as if it were a natural mode of outlet and relief to some inward torment and passion. In the midst of all this hurly-burly of the elements, a slight altercation arose between the steward's assistant and the cook in the forecastle, and one had retorted on the other with the expression, "You be blowed!" At any other time this would have sounded as only a mild

anathema, but at that moment—with all that wind tearing us to pieces—it seemed ridiculously superfluous and rather cruel to wish a fellow creature to be "blowed." Up to this point we had managed to keep on deck by holding on; but now, being utterly prostrate, a stout seaman took us in his arms and placed us in a berth below. There, for fifteen or sixteen mortal hours, with groans, spasms, and throes of pain, we rendered unto Neptune the things that are Neptune's (in a gale of wind, at least), and more, probably, than Neptune cared to receive; for it seemed as if all the bile were being squeezed out of the liver, all the blood out of the veins, all the marrow out of the bones. About noon or afternoon of the following day we began to feel somewhat different. Whether it was that the wind had gone down a little, or whether soda-water and brandy had at last consented to keep on the stomach and comfort it, certain it is that a lull or *quietus* ensued; bowels of torment became bowels of mercy, and after a little sleep the mind resumed the thinking common to that period of its history and experience. Very sad and gloomy thinking it was! We were on our way to England, hoping to obtain some employment in London. We were poor, both in worldly means and in spirit; frail in body, nervous by temperament, weak in health, morbidly sensitive in feeling, and the prospect of any success in life seemed as low and as dark as it could well be. It seemed as if the late tossings on the waves typified the tossings of coming life; gloomy probabilities took possession of our recovering powers, and formed, as it were, the premises of our forms of thought.

The little troubles of that voyage, real enough to a weak and sensitive temperament, but probably nothing to those of hardier and healthier grain, came to an end in due time, and the packet delivered us all safe, if not sound, at Hull. But for many months afterwards, in the din and turmoil of London streets, in the carrying on of that most depressing of all pursuits, the unsuccessful seeking for employment; amidst the heat or the cold, the weariness, the hunger, the faintness, the disappointment, the despair,—the tossing of that North Sea voyage came vividly back to our fancy, and almost every day the absurd expression of those quarrellers in the forecastle sounded again in our mental ears, with the added malignity of a personal application. It seemed as if all the people in the streets regarded us as interlopers in the world, as having intruded into it without invitation and without any plea of necessity; they seemed to anathematize us between the teeth, and say, "You be blowed!" Everywhere the same

avoidance or rejection—sometimes civil, sometimes uncivil; sometimes polite in phrase, sometimes coarse, but practically always amounting to this: "We have no interest in you, don't care for you, don't want to see you, won't be bothered about you—'you be blowed!'" More than once we heartily wished we were "blowed," and that that stiff breeze in the North Sea, which had so tried us a few months previously, had thoroughly finished its work there and then, and blown us out of existence altogether. But time brings roses, or, at any rate, it softens miseries; and after long waiting, and many disappointments and privations, we found ourselves settled in a provincial town on the southern coast of England —not in prosperity, but with bread and peace. The bitterness passed away, and with it also the recurring tendency of that foolish phrase which had been so strangely borrowed from two thoughtless squabblers on board a packet, and had served as a sort of refrain or burthen of our despair. But the tendency to link odd memories with painful experience was not extirpated; "desipere in loco" (sometimes *out* of place as well as in) remained a human habit. Folly occasionally flies in at the window, to neutralize or temper the sorrow that so readily comes in at the door.

One Sunday afternoon we were taking our accustomed solitary walk by the seaside. The day previously there had been a most terrific and disastrous storm, which, though it had now passed, still made the wide waters look swollen and angry. A schooner laden with iron had been driven on to a shoal near to the village through which we were sauntering, and had been completely wrecked there. Some of the crew had been drowned, but we saw the captain and one or two others who had been taken by lifeboat out of the rigging and brought in an exhausted condition to the shore. Our imagination was excited by the horrors of the scene. In fancy we were out at sea, and had the tempest all over again: the howl and scream of the wind, the angry snarl of the tossing waves, the white foam of the breakers, like spite upon the lips of malice; the breaking of the rudder, the gaping of the seams, the rush of water into the hold and cabins, the shriek of drowning men, and the agony of those that clung to spars and shrouds. It was a most awful mental picture, full of distress in its acutest form. It had not endured many minutes, when suddenly, and in the oddest and most unexpected way, there arose, as it were, a voice singing from some out-of-the-way recess or cavern of the mind, two lines out of a then popular negro melody—

> "There's some one in the house with Dinah,
> Playing on the old banjo."

What on earth had Dinah and the banjo to do with so terrible and tragic a scene as this storm and wreck? We know not. We were startled by the incongruity, and for a while reproached ourselves with frivolity; but after-thought on the matter has suggested that probably it is the intention of Providence to train us by sharp contrasts as well as by gentle gradations; that as no passion in great intensity is for long a healthy condition of soul, though useful, perhaps, in brief visitation, we need to be reminded (sometimes suddenly and abruptly reminded) of the contemporaneous existence of utterly opposite feelings and circumstances to our own. While there is gloom in one latitude, there is brightness in another; while there is sorrow in one heart, there is becoming gladness in another; while storms are raging round Prospero's Isle, and all seems darkness and destruction, some glad Ariel elsewhere is revelling merrily "under the blossom that hangs on the bough."

When some mind accustomed to dictum, dogma, and authority, a learned and accomplished mind, perhaps, and as far as there is any life in it, not insincere; but a mind covered with the dust of the schools, and neither large nor free, nor fresh nor beautiful, presumes to preach to the public in over-positive tones, and tries to straiten, repress, and formalise culture, with a view to some party ascendency, some church or sectarian triumph, or some selfish political victory, might it not occur to one outside the range of this influence and authority, to wish for it, as a most healthful benefit, a shaking up and knocking down like that of a gale of wind upon the seas, something to set the billows of thought heaving and rolling, making bigotry cast up its bile, and intellect overcharged with assumption and conceit, to throw them off and wait for a while in weariness and humility, until returning mental calm and health should induce a craving for better aliment and nurture. To say to such a mind, "You be blowed," would not do, because we suppose it would be inelegant, ungrammatical, and vulgar; but a polite equivalent for that phrase might not perhaps be altogether inappropriate; "Be ye blown upon by the common air of humanity, by the wind of thought, even when it is rude enough to unsettle and disturb old and cherished opinions! Be ye stirred and pushed aside or onward by the movements and change of scientific enquiry!" All the great minds of the world have been blown upon in this way, and in the end have been very thankful for it.

Again, there are occasions when the other piece of nonsense just quoted, would not be without some sort of pertinence and useful suggestion, when fanatic emotion and theological fancy have cast funereal gloom over life, when men are told that this world is nothing

better than a "howling wilderness" and a "vale of tears;" when the Irish, of all people in the world, are reminded in rhetorical phrase that they are "surrounded by a melancholy ocean;" when men are taught that this human nature with which God has clothed them, is not only very imperfect (which it must necessarily be) but "vile and filthy" (which it need not be), one is we think, entitled to say, "surely there is some little exaggeration here, else how could cheerfulness exist in the world, even for an hour? would there not be even under summer skies and amidst fair flowers, an abject misery, a weeping and wailing and gnashing of teeth?" And yet it is not so. It is wisely and mercifully ordered that humanity shall laugh as well as weep, that though it must necessarily endure a large share of pain, anguish, and sorrow, it may also enjoy at intervals abundant hilarity and fun. Considering the whole earth as a house with many mansions, there are and must be in many of its chambers, want and woe, sickness and sadness, fulfilling their mysterious purpose; but in other rooms, there are and ought to be, hope, merriment, and joy. For ourselves, naturally more disposed to the Penseroso than to the Allegro movements of mind, and not at all unfamiliar with melancholy, we have yet always felt some relief and thankfulness at the thought that at the moment when we are miserable, some one else is gay, that while we, in gloomy solitude, are listening to imaginary wails and dirges,

"There's some one in the house with Dinah
Playing on the old banjo."

Whoever he may be, let him play on, for the music and the songs of life are great alleviators of its troubles—

Minuenter atræ
Carmine curæ.

If then there be "a soul of goodness in things evil," there may also be a suggestion of wisdom in things nonsensical, and the genial and intelligent reader of these pages may be safely left to distil it out. We are not addressing that stale, musty, pent-up order of minds that need to be "blowed" before they can be made fresh and wholesome, but rather that more reasonable and pleasant sort of people, who see no harm in accepting a little gay relief to life's troubles and cares, even though it should come through so grotesque a medium as a nigger and his banjo.

SOCIETIES.

MEETINGS, ETC.

ROYAL GEOGRAPHICAL SOCIETY.—The ninth Meeting of the present Session was held on Monday evening, the 27th of March, Major-General Sir Henry C. Rawlinson, K.C.B., Vice-President, in the Chair.

A letter was read from Sir Samuel Baker, addressed to Sir Roderick Murchison, from Toofikeeya, on the White Nile, in lat. 9° 26′ N., and dated the 6th of December last. Sir Samuel was then breaking up his quarters near the mouth of the Giraffe River, and had despatched the main body of the expedition to Gondokoro, himself preparing to follow with the rear. Whilst waiting for the favourable season since July last, he had made a journey to Khartum (680 miles by river), to assure himself that the requisite preparations were made, according to his previous instructions to the Governor. His fresh troops and supplies followed, from Khartum, on the setting in of the north wind, and he was able to despatch his first division in eight vessels on the 1st of December to Gondokoro. During his stay at Toofikeeya he had entirely suppressed the slave-trade of the White Nile, and he trusted that England would appreciate the sincerity of purpose of the Khedive (who had supported him unflinchingly in this unpopular proceeding) in thus purifying the river from the abominable traffic. The expedition would cut its way through the accumulation of marsh-plants by way of the Bahr Giraffe. On arriving at Gondokoro it was his intention to proceed by land to Ibrahimeya (3° 32′ N. lat.) bringing two life-boats and the eighty-feet steamer in sections by carts; having thus passed the cataracts which obstruct the river above Gondokoro, he would explore the smooth waters of that part of the river lying between the obstruction and Lake Albert Nyanza, and, if he found the course clear, would return to Ibrahimeya, put together the steamer, and embark for the Great Lakes. With the exception of Dr. Gedge, the naturalist, who had sickened and died, the party were in good health, and much was due to the exertions of Lieut. J. A. Baker, R.N.

The paper read was on "The Chinese Province of Yunan and its Borders," by Mr. T. T. Cooper. The author had traversed the western portion of this remote province in 1869, after his unsuccessful attempt to cross from the Upper Yang-tsze to Assam. The mountainous country along the border was peopled by a number of

separate barbarous tribes, more or less under the influence of the Chinese. The border-country is wild, but the interior of Yunan is fertile and picturesque, and exceedingly rich in agriculture and mines. All attempts hitherto made to open up a route between this fine province and our possessions in Burmah or Assam had been in vain.

After the reading of the paper, the Chairman read a most graphic, and evidently truthful description of Western Yunan by Bishop Cheauveau, who had been for fifteen years resident, as Roman Catholic Missionary, in this little-known region. The chief city, Tali-fu, was situated on the shores of a beautiful lake, forty-five miles long, by twelve to fifteen wide. The plain on its western side formerly contained a population of upwards of 400,000 souls. The climate was fine and healthy; copious harvests, excellent fish, fruits, and vegetables; good and numerous horses and mules; a kind and gay population; such were some of its recommendations. There were nine other great plains similar to that of Tali. The city was the centre of a great trade with all the surrounding populations, and was the point whence started the caravan trade with Burmah, which formerly passed by Momein to Bhamo, on the navigable part of the Irawaddy. According to the Bishop, the country had much deteriorated since it had revolted, under the instigation of the Chinese Mahomedans of Yunan, against the Imperial authority.

In the discussion which followed, Major Sladen (the Commander of the late expedition from Burmah to Yunan) confirmed the Bishop's statement—that the natural route for trade was viâ Bhamo, and spoke favourably of the Mahomedan chiefs, who had received him in the most friendly manner at Momien. Mr. A. Michie, of Shanghai, Dr. Barton (of the first Upper Yang-tsze expedition), and Mr. W. Lockhart (formerly resident in Pekin), also spoke. All the speakers agreed in stating that English travellers met with good treatment, and even welcome, from the Chinese people, and that all opposition arose solely from the interested and corrupt mandarin class.

Institution of Naval Architects.—The first meeting of the twelfth session of this Institution was held on Thursday morning, the 30th March, in the Hall of the Society of Arts, by permission of the Council, the Right Hon. Sir J. Pakington, Bart., M.P., President, in the chair.

The Honorary Secretary, C. W. Merrifield, Esq., read the report of the Council, which stated that the Institution was in a flourish-

ing condition both as regards its progress and its financial state. It alluded also to the success of the Royal School of Naval Architecture and Marine Engineering.

Sir John Pakington then addressed the meeting. He congratulated the members on the financial prosperity of the Institution, and also on the continued success of its child, the Royal School of Naval Architecture. He alluded to the valuable services of Mr. Merrifield, the Secretary, and cordially agreed with the paragraph in the report which expressed the hope that by the next Annual General Meeting the finances of the Institution will enable the Council to attach a pecuniary compensation to the arduous duties of the Secretaryship. He then said, "Gentlemen, in nautical matters, as in others, science does not stand still. We have abundant proof of that on every side, and we have the satisfaction of finding that while science is advancing in a variety of ways, this institution enables us to draw together the many proofs of those advances in science, and here to discuss and consider, and permanently to record the various changes that take place, and thus to fulfil the useful and valuable mission which I consider to be the function and immediate duty of this Association. It would not be for me, even if I were competent, which I am not, to enter into the various respects in which those various branches of science relating to our particular duties are progressing and advancing; but I cannot help briefly glancing at the changes which are taking place with regard, for instance, to improvements in steel, and the extent to which it seems probable that, at no distant day, steel, to a certain extent, at all events, will supersede the use of iron. Simultaneously with those changes with regard to steel, we find the manufacture of iron is also being greatly changed and greatly improved, and it is impossible to regard with indifference the improvements in these metals, bearing, as they inevitably will in an important degree, upon the construction of our ships in future days. Other great changes have taken place with regard to the manufacture of marine engines, and I am exceedingly glad that we made that change last year of admitting marine engineers as members, as they ought to be most fitly, of this Association. I think it was a most desirable and beneficial change, and that in many ways we are reaping the benefit of it; and, if I may believe and trust what I hear, I believe the marine engines of the present day are almost as different from the marine engines which were placed in vessels when they were first propelled by steam as those engines were from the unassisted canvas. Such is the progress of science, and that progress is continuous and uninterrupted.

Gentlemen, there is another subject to which I think it my duty briefly to refer. It will be in the recollection of many who are here, that when I made my opening address at this Institution last year, I adverted to several melancholy cases which had arisen of the loss of ships at sea. I remember stating to the meeting that, having thought it my duty to put certain questions on the subject in the House of Commons, I had received from all parts of the country communications of such deep interest, and tending to excite such vague suspicions and doubts as to the state in which many of our merchant vessels are sent to sea, that I thought it my duty to consult this Institution as to whether, in their judgment, the time had not arrived when it would be desirable to raise some question upon this subject in the House of Commons. The opinion of the meeting was that the subject did require parliamentary attention, and I think it my duty, therefore, to mention to the Institution that, in furtherance of what I understood to be the wish and request of my brother members of the Institution, I did call the attention of the House of Commons to the subject, and moved a resolution praying, in substance, that a commission should be issued to inquire into the cause of the great loss of life and property at sea during the last few years, and to inquire if any and what changes could be made with respect to collisions, over-loading, stowage of cargo, and other matters with a view of giving increased safety to passengers and merchant ships. That resolution I moved in the House of Commons, and a debate, I think I may say of considerable interest, took place, the result being that I did not find it desirable to divide the House on the subject, and in consequence of the turn which the debate took I withdrew the motion, but with an intimation that the subject would not be considered as being at an end; and I am willing to hope that, even as matters now stand, that discussion was not altogether without satisfactory results and some fruits. This year the subject has been again mentioned in Parliament by another honourable member, and some little discussion upon the matter took place. We have again before us that huge Mercantile Marine Bill—a great volume, in fact—which was brought forward last year. I cannot say I have read all the numerous pages of that tremendous Bill, but I believe it is essentially much the same Bill as that of last year. I think the general impression last year in the House of Commons was, and I believe the general impression among those conversant with the subject was, that the provisions contained in that Bill for the corrections of those evils to which I have now adverted were not altogether satisfactory. That is, I think, still the impression of

those who have considered this subject, and it is satisfactory to be able to state that, in the discussion that took place, the present President of the Board of Trade was strongly pressed, in the event of the business of the session being such as not to allow a full discussion of the great Mercantile Marine Bill, to embody that particular portion of the Bill which relates to the safety of ships at sea in a separate measure, and bring it forward during the present session under such circumstances as to allow Parliament fairly to discuss a question so important to the lives of our sailors and the property of our shippers. That is the position in which the case now stands. Of course it will be the duty of those who take an interest in this subject—and I am happy to see some gentlemen among us here who are members of Parliament—to remind the President of the Board of Trade of the promise which he has made, and I am sanguine enough to hope that the session will not pass without the attention of the House being called to this subject. I cannot say, gentlemen, that I am familiar at this moment with the statistics of our losses at sea during the time that has intervened since last year. Whenever I make myself master of those statistics, I think it very probable I may find that, at all events, those casualties which arise from blameable causes have not been so numerous as last year, because I think it probable that the discussions in Parliament last year would act as a warning to those who might have been in need of any such warning. I hope and trust we shall hear of no more *Sea Queens* in the present year, and I trust, however that may be, or whatever may be the statistics of last year, and however favourable they may appear—whether they are favourable or not I really do not know—that Parliament will not be diverted from giving serious attention to this subject, which I myself entirely and fully believe to be necessary. Gentlemen, I think I might here end the observations that I think it my duty to make to you to-day, were it not for one painful subject, which I feel it to be impossible for me to pass over in silence—I allude to that terrible event which cast a gloom over the whole of this country, the loss of her Majesty's ship *Captain*. Gentlemen, I, perhaps more than most people, have peculiar reason for regarding that subject with the greatest interest. I was not only personally a sufferer, by the loss of a very near connection, who was as promising a young man as ever entered the naval profession, but the share which it was my official duty to take in the construction of that ship has also made me feel a peculiar interest in the subject, and of course has caused me to watch her short career with unusual care and with unusual interest. It so

happened that, in point of form, rather than in point of fact, I think I may say, it devolved on me to order the construction of the ship. When I was appointed First Lord of the Admiralty, in the summer of 1866, the position of things which I found was this:— The public mind had been a long time anxiously attending to the suggestions of the unfortunate and ill-fated Captain Coles with regard to this subject. He was a very able man, as we all know, and he had invented what he thought, and I believe rightly thought, a very great invention—a great improvement in the construction of our war ships. He had pressed those views upon successive Boards of Admiralty, and in deference, I think I may say, to those views so urged by Captain Coles, her Majesty's Government, through the Admiralty, presided over by the Duke of Somerset, had built the *Monarch* as a ship intended to meet the view of Captain Coles, and to solve the great practical problem which had been pressed so much by Captain Coles, namely, that a turret ship might be built as a cruiser. Nobody doubted the possibility of using turret ships for coast defence, but the real problem was whether a turret ship could be a cruising man of war. The *Monarch* was built to solve that problem. But Captain Coles would not accept the *Monarch* as a satisfactory solution of his problem. He took great objection (but I will not detain this meeting by dwelling on the points to which he objected) in several respects to the construction of the *Monarch*, and before the Duke of Somerset left office he decided, and I venture to say wisely and rightly, to call upon Captain Coles to submit his views to the Admiralty, with an understanding that he might select one of our great ship-building firms and build a ship according to his own views; and I think out of a list of six (speaking from memory, I think it was before the Duke of Somerset left office), with the concurrence of the then Board of Admiralty, Captain Coles decided to entrust the building of that ship to the well-known and highly respected firm of the Messrs. Laird, of Birkenhead. It then devolved upon me, after succeeding the Duke of Somerset, to carry out this intention, which I was most thoroughly disposed to do, because I thought it right that the great question raised by Captain Coles should be fairly solved; and in an interview with Captain Coles, in the name of the then existing Board of Admiralty, I told him to persevere, to build his ship, and I entirely approved of the selection of the Messrs. Laird, as being the best persons to whom he could entrust that duty; and I required that the designs and plans which he intended to adopt should be submitted to the then Board of Admiralty which was acting under me. Well, gentlemen, Captain

Coles shortly afterwards brought his designs and his plans, and showed us a ship which was to be upwards of 300 feet in length, which was to be upwards of 4,000 tons in size, but which was to have a free-board of only 8 feet. In a private conversation in my room at the Admiralty with Captain Coles, I shrunk very much from this free-board of 8 feet. It will be in the recollection of most of you, after I brought forward that melancholy event, the loss of the *London*, that the Council of this Institution undertook, and in a manner which I have always thought greatly to their honour, carried out, an investigation into the various modes of constructing sea-going ships, and I think they arrived at the conclusion that 8 feet free-board was the very minimum which could be safely assigned to a ship of anything like the dimensions to which I have adverted; but considering the construction of a man of war, and considering the weights of various kinds that she has to carry, I confess it was with great reluctance that I consented to a free-board of 8 feet. But I did consent to it on this ground—that the principle on which I was acting was that Captain Coles should solve his own problem, and that, as he pressed to have a ship with that free-board, it would not have been consistent with the principles on which I was acting to interfere further than to express my doubts and fears with regard to the success of so low a free-board. Gentlemen, you know the result; the ship was proceeded with, the ship was launched, and to the astonishment of everyone, I think—and I confess I can never forget the dismay with which I heard it—instead of a free-board of 8 feet, the *Captain* was launched with a free-board of only 6 feet. Gentlemen, you must all feel that this serious deviation from the design of the ship has led to many grave questions, and will lead probably to many more grave questions. Such questions as these have arisen, and must arise. What was the cause of the great deviation from the original design? Was that deviation from the original design the cause of the loss of the *Captain*? That is another question. A third question is, When that great deviation from the design was discovered, what steps were taken? Were proper steps taken to test the effect of that deviation on the stability of the ship? If no such steps were taken, why were they not taken, and who was to blame?" In conclusion, he deprecated the discussion at the meeting of any personal matters on this painful subject, and recommended that it be treated only as a matter of scientific inquiry from which to draw whatever useful inferences and sources of instruction the members may be enabled to do.

The following papers of which we can only give summaries were then read and discussed :—

On the Improved Compound Engines as Fitted on Board H. M. S. Briton.—By G. B. Rennie, Esq., M. Inst. C.E., Member.—These engines were adopted by the Admiralty with a view to economy in consumption of fuel, and they are thus made:—The smallest cylinder is 57 inches diameter, and the larger 100 inches diameter; the stroke of piston in both, 2 feet 9 inches. The smaller cylinder is fitted with a sliding expansion valve, to cut off at from one-third to one-fifth of the length of stroke; but in order to have the advantage of the cranks of the two cylinders being at right angles to one another, the steam is not discharged direct from one cylinder into the other, but there is an intermediate chamber or reservoir between the two cylinders, into which the steam is received from the small cylinder and discharged into the large one. This chamber is made of copper and brass, and re-heats the steam within by means of a steam-jacket.

On the official trials of these engines, the pressure of steam in the boilers was about 60 pounds per square inch, and the vacuum in condenser from 27 to 28 inches. Under these conditions, it was found that the power developed by each of the two cylinders was practically identical, and the same pressures were exerted at half-stroke when working "full power." The power obtained at "full power" was 2,148 horses, giving a mean speed of ship of 13·128 knots.

For an engine on the system of the *Briton*, the consumption of best coal may be taken at 2 pounds per horse's power per hour, when developing about six times the nominal power; at 1⅔ pounds per hour, when developing three times the nominal power; at 1¼ pounds per hour, when developing twice the nominal power.

Comparisons were made with different classes of engines, which in point of economy of fuel and speed obtained, gave a decided superiority to the *Briton* engines.

The author's experience led him to think that with these engines there is somewhat less wear and tear than with the ordinary engines, as the pressures and strains are more uniform and less liable to sudden shocks.

In conclusion, he stated his opinion that the "compound" system of engine has been a gradual but marked step in the improvement of steam-ship propulsion with respect to economy of fuel; as important as the "injection" condenser over the simple high pressure —discharging the used steam into the atmosphere, or the surface

condenser over the injection, and may be compared to the progress of organization in animal life, where the higher the organization the more delicate is its nature.

On Steel as applied to Shipbuilding.—By J. B. Howell, Esq., Associate.—The author alluded to the prejudice against the use of steel for shipbuilding, which has existed on account of its supposed brittleness. He said "we are now enabled to make steel suitable in the highest degree for shipbuilding, and I beg to call your attention to the samples exhibited. All these examples have been bent cold, which is a simple and safe test for steel plates; and some of them, before bending, have been heated to a red heat and plunged into cold water, which is a doubly sure test; these particular pieces are marked "A," but they do not appear to have suffered from the severe ordeal they have passed through. The samples are bent, to show the angles to which the various thicknesses of plates should be bent, as a proof of their suitability for ship plates. The extreme test of 180° is beyond the necessary test for plates of this character, but plates up to a quarter of an inch in thickness should always bear bending to that degree. The steel may be easily sheared, punched, caulked, and welded, and is fifty per cent. more rigid than iron. The term steel can barely be applied to this metal, as the very small amount of carbon it contains would prevent its being put in the same category as steel. The samples on the table contain 0·2 of carbon. This, I consider should be the maximum quantity of carbon in steel intended for shipbuilding; for all plates containing this quantity of carbon never fail to give the required tests practically. We have discovered, in our long and extensive experience, certain irons as being the most suitable for the manufacture of these plates, and as there is no reasonable limit to the supply of these irons, there is no difficulty in turning out large quantities of these plates regular in their manufacture. The strength in tension of this steel is about thirty-six tons per square inch, and the limit of elasticity about twenty-three tons. From this, it can be seen that the rigidity of mild cast-steel is nearly two-thirds of its ultimate breaking strain. The limit of elasticity in iron is only one-half of the breaking strain. Steel is, beyond doubt, stronger than iron; it is much stiffer, and far more ductile; and I think, were it used only for the skeleton of ships plated with iron, it would be a great gain in strength and stiffness of the whole structure.

"Steel plates of one inch and less in thickness will resist the impact of shot much better than iron. During the experiments at Shoeburyness, conducted by the Iron Plate Company, and referred

to by Sir William Fairbairn in the "Transactions" of the tenth session of this Institution, steel plates quarter of an inch thick were found to have a resistance equal to iron plates half-inch thick, and steel plates three-quarters of an inch thick were equal to iron one inch thick, and steel plates one inch thick had a resistance exceeding iron plates one and a quarter inches thick, but not equalling iron plates one and a half inches thick. The steel plates two and a half inches and three inches thick had no value against the impact of shot, and the first shot in each instance shattered the plates. This result we were quite prepared to expect, as our mechanical appliances were not equal to the successful manufacture of large, thick plates. To ensure ductility in mild steel plates, we require a blow or squeeze sufficiently great to change the granular structure of the cast metal, so that, when broken by tension, it has a conchoidal fracture, or, as it is understood in the trade, knock fibre into it. The market price of these plates, also angles and bars is from £25 to £30 per ton; a price, I think, sufficiently low to create a demand for them; for although it may seem a large price compared with ordinary ship plate iron, it will be found economical to use it, not only in the durability of the ship and in repairs, but in the greater safety to life and cargo."

On a New Method of Testing Metals and Alloys by Bischof's Metallometer.—By Lewis Orlick, Esq.—This paper having reference only to a new apparatus for testing metals and alloys, we do not consider it necessary to do more than make a passing reference to it.

On a plan for conveying railway trains across the Straits of Dover.—By Evan Leigh, Esq., Engineer, Associate.—The author alluded to the great want of better means of communication, and to the numerous schemes which had at various times been proposed to effect the desired object, none of which had yet been attempted. He then referred to his plan which was exhibited at the International Exhibition of 1862, and which he described as large ferry boats that can easily be made to take the trains over in any weather, or at any state of the tide. The diagrams exhibited showed a general plan of steam ferry and a section of same, with harbour; a breakwater, about the same length as the ferry-boat; at the upper end of the harbour is a floating landing-stage, to which one end of the bridge is attached by strong hinges, the other being hinged on the land side. A double line of rails are laid on this bridge to correspond with the up and down rails. The centres of the bridge-hinges are in a line with the top of the rails, so that there will be

no gaping of the rails when the tide is out. At half-tide, the rails on the bridge form a straight line with those on the boat and the rails on land. To compensate for the slight difference in distance, caused by the arc of the curve made by one end of the bridge moving up and down, the landing-stage, to which it is firmly hinged, will be thrust a little further out in the dock at half-tide, or drawn nearer to the shore at high and low water. This difference will only be about three inches. By this arrangement, an exact junction is effected with the rails on deck and those on the bridge, whatever be the state of the tide. Provision is made for any inequality in the draft in case of the boats being more heavily laden at one time than another. As the construction of the boat is the same at both ends, it is not required to be turned round. The bottom of the boat is provided with a keel, not reaching from end to end, but stopped off a sufficient length, so as not to interfere with the landing-stage. A rudder is fixed at each end of the keel.

The rudders are so connected together, that one cannot move without the other moving in the opposite direction, thereby effecting an equilibrium more perfect, and, it is submitted, more mechanically correct, than any other plan that can be devised.

The author gave a detailed description of the construction of the paddle wheels, and stated that the engines consisted of four steam cylinders, of about forty-inch diameter and fifteen feet stroke, two to each paddle. The engines are on the oscillating principle, and in making thirty strokes per minute, have a piston speed of nine hundred feet per minute. They are fitted with expansion valves, to cut off the steam at any part of the stroke, and have surface condensers.

The boilers are on the water-tube, high-pressure principle, proved up to five hundred pounds to the inch, and work at a pressure of about seventy pounds.

The cost of two of such ferry-boats with harbour and bridge on each side of the channel, was estimated as included in £1,250,000, and according to the author's calculations it appeared that the expense of each crossing need not exceed fifteen pounds. He further estimated that the traffic would pay ten per cent. on the capital, and in conclusion he proceeded to make sundry comparisons with other projects in favour of his own scheme.

On the efficiency of Jet Propellers.—By Cavaliere B. Brin, Director of Naval Construction, Ministry of Marine, Florence.—The author stated that among the various plans for the propulsion of ships which have been proposed or tried, those in which the propelling

force is produced by the reaction of one or more jets of water form a special category by themselves. Ruthven's hydraulic propeller, applied first to the *Nautilus* and afterwards to the *Waterwitch*, belongs to this class. The results obtained with it, so far as the amount of useful effect is concerned, were much more satisfactory in the latter vessel than in the former, but were, nevertheless, very inferior to those given by screw or paddle-wheel. Hydraulic propellers, in certain respects, offer some advantages, and might, under certain given circumstances, be preferred to any other. It consequently, seemed to him that it might not be altogether useless to investigate the theory of these propellers, with a view to ascertain if the low amount of useful effect obtained ought to be altogether attributed to the inherent defects of the system, or if it might not be remedied by the adoption of suitable arrangements.

He then proceeded to demonstrate the utility of the propellers by mathematical calculations, the result of which pointed to the increased utility that would be obtained for Ruthven's hydraulic propeller by an improvement on its present arrangement.

On the Improvement of the Channel Service between Folkestone and Boulogne, and the vessels proposed to be employed. By Michael Scott, Esq., M. Inst. C. E., Member.—The author's proposal may be briefly summarised as follows:—

To provide for a tidal service between Folkestone and Boulogne, and taking care that the vessels, in size and cost of working, did not exceed the paying capacity of the trade, to quote Captain Tyler's recommendation, by "larger vessels with less movement in rough weather, more shelter, and better accommodation generally;" and, in order to effect this, to carry out certain improvements in the harbour of Folkestone, leaving the French authorities to do the needful at Boulogne, which will probably only include the works now being executed for increasing the breakwater, and the arrangements for the landing and embarkation of passengers at the west side of the harbour. The author has not had an opportunity of minutely examining the harbour at Boulogne, but judging from general knowledge of the port, his strong impression is that little or nothing more would be necessary.

With regard to the vessels which it is proposed to employ, the author proposes that they should be about 300 feet in length between perpendiculars, and about 36 feet in breadth. The ordinary draught of water to be 8 feet 6 in., with all weights on board, including passengers and their luggage and a considerable quantity of goods; and the vessels to be so constructed that, by the admission of water

ballast when at sea in bad weather, they would be steadied by having their draught increased to 11 feet.

The vessels to be propelled by two pair of paddle-engines driving one pair of wheels amidship, and the speed to be 17 knots. Having two independent sets of propelling machinery, the vessels would require no masts, sails, or rigging.

It is further proposed that there should be three cabins for first-class passengers, viz., a main saloon, a ladies' saloon, and a cabin where refreshments could be obtained, and that there should be an after-cabin for second-class, and a fore-cabin for third-class passengers.

The first-class ladies' cabin would consist of a lofty saloon, before the machinery; further aft would be the main saloon, of large dimensions; and in connection with all the cabins there would be lavatories and other conveniences.

In addition to the unoccupied main deck fore and aft, and over the machinery, and to the wing passages along each side of the saloon cabins there would be an extended promenade on the upper deck.

It is intended that the vessels should be constructed with double bottoms and double sides, in fact, except at the ends the construction would be to a great extent, like a hull within a hull; and, excepting where the steam machinery intervened, there would be a lower deck, all fore or aft, and watertight athwartship bulkheads. The result would be great strength combined with lightness, and, what is very important, security in the event of collision.

There are other reasons for adopting the construction described, which need not at present be adverted to; suffice it to say that the vessels would be almost unsinkable, a matter of some moment, considering that their course lies directly across the track of ships passing up and down the Channel. Spaces would be provided into which water ballast could be introduced, and thus the draught increased and the vessel steadied at sea in bad weather; and when nearing port the water could be expelled, and the vessel raised to her light draught again. By simple arrangements these operations, namely, the admission and expulsion of the water, could each be effected in less than five minutes.

The author asserted that the proposed vessels would possess steadiness in a sea-way, would afford shelter and accommodation for a large number of passengers; would have high speed and superior steering and manœuvring powers, and would be so constructed that the vans containing baggage should be ferried across without being

unloaded. In support of these assertions he stated his reasons at great length and to good purpose.

On certain Strains to which Ships are subject.—By E. J. Reed, Esq., late Chief Constructor to the Navy.—This paper was similar to that read by Mr. Reed before the Royal Society on the 9th February, the substance of which will be found in our March number.

On the relative influence of breadth of beam and height of freeboard in lengthening out the curves of stability.—By N. Barnaby, Esq., President of the Board of Construction to the Admiralty.—The paper showed that though with great beam ships of low freeboard may be made quite safe against upsetting, nevertheless peril is far more readily incurred or averted by alterations in freeboard than by alterations of beam, and that for sea-going cruisers high freeboard is an essential feature, as shown by the stability curves of various vessels with towering sides and presumed to be top-heavy, but which with small initial stability have a great range of righting power extending even to a heeling of fifteen degrees beyond their beam-ends. Danger to a ship was shown to depend not on the mere amount of its stability, but on the proportion which the angle of permanent heel under canvas bears to the angle at which the stability is at a maximum.

[Our space precludes us from giving, in the present number, summaries of all the papers read, but we propose to continue them in our next.]

Royal United Service Institution.—A most valuable paper on "The Attack and Defence of Fleets" was read on 3rd of April, by Captain P. H. Colomb, R.N.—Although the title of the paper had reference to the operations of fleets, the author confessed that the magnitude of the subject, and the limit of time allowed for its consideration would not admit of his taking up so wide an investigation as the title proposed, and that he was compelled to confine himself to the attack and defence of single ships. Taking the *Monarch* as a typical ship, which vessel he said was the embodiment of the idea that the gun is the decisive weapon at sea, and that this weapon is most powerful when mounted in limited numbers of the greatest size and with the largest arc of training, he proceeded to consider the present value of guns in maritime warfare. As regards the relative value of the gun now as compared with its former position, he adduced numerous figures and examples to shew that in point of fact the

guns are now about five times as weak as they were five years ago, and he stated that this startling conclusion was most worthy of investigation, and expressed his belief that if his figures and deductions were correct that we are close upon a very extraordinary re-construction of the Navy. As regards the present actual power of the gun, the inquiry would seem to be "How many shot will strike the hull of a *Monarch* in a given time in the open sea, and what amount of damage will they do?" The necessary data for answering such queries being not only most difficult to get at, but at the best necessarily imperfect, it is not easy to draw reliable conclusions. However, from such calculations as could be made and taking a *Monarch* against a *Monarch*, the actual gun power of one ship would seem to be that in six minutes from the opening of her fire on the sister ship at 1,000 yards she will have fired twelve shots, of which one will have hit and another may have glanced, and it remains an even chance whether the single hit will have penetrated the enemy's armour.

The question of rams was next considered at some length aided by sundry diagrams. The author asserted that he had only touched the outskirts of the question, and he urged naval officers to turn their intelligence fully upon it. The conclusions he arrived at were as follows:

1. The end-on position must never be taken up by a ram until the moment her spur strikes the object.

2. Extreme speed is not so necessary for a ram as extreme powers of turning.

3. Great length and weight are an inconvenience to a ram. It may be added that they are not necessary for an effective blow. The work done upon a ship by the 400lb. shot from the eighteen ton gun is under 5,000 foot tons. The work done by the stem of a vessel weighing 1,000 tons, propelling at ten knots, is equal on impact to 4,720 foot tons, and the work is done below the armour.

4. So far from ramming being a difficult or impossible task, it is a thing which can be accomplished by superior skill with vessels otherwise equal. But a ram whose turning powers are much greater than her adversary's, may attack her with every confidence of success.

As regards the ordnance to be carried by a ram, the author confessed he was doubtful about the end-on fire, being much inclined to agree with Admiral Jurien de la Gravière, a great French authority, who said, "The poor advantage to be gained by a discharge rendered uncertain by the rapidity with which the distance varies, cannot compensate for the cloud of smoke which would

envelope the ship at the all-important moment, when her safety depends on the precision with which she is handled."

The author then took up the subject of torpedoes; he adverted to the outrigger and the Harvey torpedoes, each of which he considers of value under certain circumstances, the former he believed would be successful in an attack from the rear, the latter as a defence against rams in large and long ships. He considered that torpedoes are destined to play an enormous part in the operations of future naval war, but it seemed to him that the effort of two torpedo ships will be confined to ascertaining which has superior speed, and the strong probability is that in the ascertainment of that fact one of the two will perish.

In conclusion, he strongly advocated further enquiry into the relative values of the gun, the ram, and the torpedo, and stated that it seemed to him a matter for very serious consideration, whether the struggle for guns which will pierce the hardest plates at long range has not overshot itself.

METEOROLOGICAL.—At a meeting of this Society on the 19th April a paper was read by Captain J. E. Davis, R.N., of the Hydrographic Office, Admiralty, on Deep Sea Thermometers. Captain Davis said, that from experience, he had found the thermometers used for deep sea purposes faulty in many respects, and that there was no knowledge whatever of the effect of pressure on them. It was reasonable to suppose that as the action of a thermometer was affected *in vacuo*, stronger effect would be produced by placing the instrument under pressure, the more especially as in the one, the pressure of only one atmosphere, or fifteen pounds to the square inch, was removed, while in the other, the atmospheres would have to be considered by hundreds, and the pressure by tons. (On this point we were not without actual observations; for Mr. Glaisher, F.R.S., during the year 1844, in some experiments made on the temperature of the Thames near Greenwich with delicately constructed instruments, found that the indications of the temperature were affected by pressure on the bulb of the thermometer, and that at a depth of only twenty-five feet, or about three-fourths of an atmosphere, the readings were increased by 2°.)

Captain Davis suggested to the Hydrographer, that he might be permitted to place himself in personal communication with the makers of thermometers with a view of obtaining an improved form of make, and also that when those were obtained he might subject them to a series of experiments under pressure for the purpose of obtaining a scale for correcting them for pressure at

different depths of the ocean. In both these suggestions the Hydrographer concurred, and Captain Davis applied to Messrs. Elliott, Casella, and Negretti and Zambra, makers to the Meteorological Department, and submitted to them certain desiderata based on his experience; subsequently Mr. Pastorelli expressed a wish to make some, which was acceded to, but as Mr. Negretti did not send any in, the number of makers were still confined to three.

A difficulty arose in respect to a hydraulic press: the use of some in London could not be obtained, and others were not adapted to the purpose, so that the testing was deferred, and some of the newly made instruments were sent to H.M.S. *Gannet*, then deep-sea sounding on the edge of the Gulf Stream; and afterwards, some to H.M.S. *Lightning* for her dredging cruize.

On the return of these vessels, the conflicting nature of the temperatures obtained, as derived from observations in their localities, rendered the necessity of ascertaining the nature and amount of error due to pressure the more imperative.

At this juncture Mr. Casella, being much interested, undertook to have a testing apparatus constructed at his own expense, capable of producing a pressure of three tons to the square inch.

Captain Davis was not aware, when proposing experiments, that a thermometer had been constructed at the suggestion of Mr. Glaisher by the late Admiral Fitzroy's directions, with the view of removing the difficulty of pressure, this was done by encasing the long bulb at the back of the instrument in glass and nearly filling the space between the case and the bulb with mercury, nor was he aware that at the time one on this principle was in the instrument room of the Meteorological Office; however, on account of their fragility the issue for the purpose of obtaining deep sea temperatures had been stopped, and virtually the means for obtaining an accurate observation were the same as before.

During the delay caused by the want of a hydraulic press, a committee of the Royal Society was appointed to direct the investigation of the Ocean Observations, since so successfully carried out in H.M. ships *Lightning* and *Porcupine*, and at a meeting of this committee, Dr. Miller, V.P.R.S. (also not aware of the existence of the protected bulb thermometer alluded to), proposed encasing the full bulb in glass, and one was made, but instead of leaving the space between the bulb and case filled with air, as proposed by Dr. Miller, Mr. Casella introduced alcohol, which being heated before sealing the case, the small uplifted space was left nearly *in vacuo*. As both the form of the thermometer and the mode of obviating the pressure were somewhat different from that described

as being already made, although the principle was precisely the same, it was decided to call it the "Miller pattern thermometer," and as this instrument was found to be nearly perfect, it was eventually used as a Standard to compare the others through the experiments.

As we hope in a future number to be permitted to give this valuable paper *in extenso*, we shall merely quote one of the results obtained.

At a pressure equal to 250 fathoms the "Miller" pattern was only affected to 0·143 of a degree, while at a pressure equal to 2500 fathoms it was 1·43°, Cassella's thermometers respectively at the same pressures 1·307°, and 12·27°, while Pastorelli's shewed at the same pressures 1·482° and 12·52°.

ROYAL SOCIETY SOIREE.—On Saturday the 22nd, the last of the two Annual Soirees, and the last under the presidency of General Sir Edward Sabine, K.C.B.,* was given at Burlington House, and the number of gentlemen attending was unusually great, probably in compliment to the retiring President.

The display of objects was limited to a small collection of the most recent and important inventions. One room was devoted entirely to the improvements lately made in the different modes of communicating by Electric Telegraph. Mr. Browning's display of spectroscopes was most interesting, as also were Mr. Spottiswoode's magnificent pair of Nicol's prisms, but our attention was more especially directed to the two or three nautical objects exhibited. These were, a well-executed half model of the *Glatton* (described in our last number); a model showing the way in which the stability of a ship is affected by altering the position of the centre of gravity, by Mr. Robinson, C.E., Master Shipwright of Portsmouth Dock Yard. This latter was illustrated by a sectional model of an iron ship in water, a weight being placed within which could be raised or lowered so as to alter the position of the centre of gravity, and the effect of this alteration was demonstrated by means of a lever above, extending on one beam, or at right angles to the fore and aft run of the ship, on which a moveable weight was placed, and the effect denoted by the moving out or in of the weight. Illustrative drawings were exhibited.

Captain Moncrieff's system of Artillery, as adapted for ships, was illustrated by a working model of a 12½-ton gun, worked by his proposed hydro-pneumatic carriage.

* As the scientific labours of Sir Edward Sabine in the cause of magnetism have been peculiarly connected with maritime objects, we purpose in our next to give a sketch of this distinguished officer's life.

NEW BOOKS.

Derrotero de la Costa del Peru. Second Edition. Aurelio Garcia y Garcia, Captain in the Peruvian Navy. Lima: 1870.

THIS little work is a revised and extended edition of the Directions for the Coast of Peru published in 1863. The author states that during late years the commerce of Peru has increased to a considerable extent in consequence of the development of agriculture, and the execution of numerous important public works, and that the increase of trade has been the means of bringing into existence several new ports which should be known to navigators. These ports are specially noticed in the new edition of Captain Garcia's book. There is abundance of information useful to seamen navigating in the vicinity of the Peruvian Coasts, which if space permitted we would publish for the benefit of our readers. We will not fail as opportunity offers to reproduce in these pages some of the more important parts of the book, but in the meantime we should be glad to see a translation of the entire work published in England.

Barometer Manual. Board of Trade. Compiled by direction of the Meteorological Committee, by Robt. H. Scott, M.A., F.R.S., Director of the Meteorological Office. London: J. D. Potter, 31, Poultry, and E. Stanford, Charing Cross. 1871.

THIS publication cannot fail to be of the greatest service to nautical men. It is published "under authority" and the data from which it is compiled are the valuable results of important observations and records, made by the Meteorological Department of the Board of Trade. But not only to nautical men will it be found useful; for there is a vast amount of carefully prepared information of great value to the agriculturist and other landsmen who are interested in Meteorology.

The present work is built up on the Barometer Manual published by Admiral Fitzroy in 1865, which is now out of print, and on the Fishery Barometer Manual published in 1869, and the book now before us is most comprehensive and instructive. The object of the work is stated to be "to give the best general rules to be observed in making use of meteorological instruments, and more particularly of the barometer, to aid in forming a judgment as to probable weather."

The three instruments essential to this end, the barometer, the thermometer, and the hygrometer, are well described, and exceedingly practical advice is given as to their management and their values, so that the observer may place some reliance on the instruments. The whole subject is treated in such a clear and intelligible manner, that it will commend itself to all who seek information of this kind. In addition to the useful particulars above alluded to there is a chapter especially devoted to the use of the barometer to seamen by Captain Toynbee, where theoretical knowledge and practical experience of winds and weather, gives great force to his remarks. The utility of the work is aided by explanatory diagrams and tables.

Mr. Scott has well performed the work entrusted to him, and we wish that similar useful books on other subjects were more often published "under authority."

Suggestions for forming a new Reserve of Seamen, and for increasing and improving the present reserves of Officers and trained Seamen in the Merchant Service for the Royal Navy. By a retired Captain, R.N. London: Harrison, 59, Pall Mall. 1871.

We have perused this pamphlet with no small satisfaction, especially as it bears out so strongly many of the views expressed in an article on British Ships and British Seamen, published in the March number of the *Nautical Magazine*.

The plan of the gallant officer is to have three divisions of Reserves, as follows:—

First Division.—To consist entirely of men-of-war's men, to be composed of ten-years' men and the surplus seamen of the Fleet, whether continuous service or not, but who are *bonâ fide* able-bodied seamen and who can produce three years' service in the Navy.

Second Division.—To consist of the present Royal Naval Reserve, composed of A.Bs. of the merchant service, and to remain under the same obligations of service, so as not to disturb the commercial marine during peace time.

Third Division.—To consist of *ordinary seamen* of the merchant service, *deep-sea fishermen*, and *first class boys*, from sixteen to eighteen years of age, who have been brought up in the training ships at the commercial ports.*

And with careful argument and analysis he shews how a saving

* The present regulations for the second class Reserve would only require slight amendments to meet the case of the first class boys, and the retainers, drill, etc.

may be effected of nearly £4000 for every 1000 men as regards the first division only (the Royal Navy division).

We quite agree with the writer as to the necessity for amending the existing regulations, for, as pointed out in the article already referred to, their present working tends to discourage men from joining. We are still of opinion that the main source of supply for our reserve should be the training ships, and we are glad to observe that the writer of the pamphlet proposes to enter boys in the Reserve. The plan suggested in our March number that the Government (*i.e.* the Admiralty and Board of Trade) should give a certain sum per annum for every "approved" boy sent into the Royal Navy or Reserve from the training ships, we believe would be found really effective.

It is a good sign when a naval officer of position and judgment comes forward to defend the system of obtaining a Naval Reserve from our merchant seamen. The practical application of the idea has undoubtedly suffered a great deal from prejudice and petty jealousies, but we think we can discern signs of a reaction. Recent events on the Continent have not been altogether without their effect in England; if we are to continue to hold our own upon the seas, we must not be ruled by prejudices, but must resolutely face the necessities of the time and adapt ourselves to them. We do not despair of seeing the Royal Navy working harmoniously with the Merchant Service for the common good of the country, and so desirable an end to be achieved is materially aided by such men as the Naval Officer who has published the pamphlet now before us. We hope many others will follow his example in thought, word, and deed.

Mr. R. O. Cunningham's *Notes on the Natural History of the Strait of Magellan*, etc., has reached us too late for notice this month; in our next we hope to be able to offer some remarks upon the work.

We have also to acknowledge the receipt of the *List of Lights, etc., of the United States, corrected to* 1871; the *Journal of the Scottish Meteorological Society, to January*, 1871; *Streffleur's Osterreichische Militarische Zeitschrift* for February, *Hunt's Yachting Magazine* and the *Food Journal* for April, and the *Quarterly Weather Report of the Meteorological Office.*

COMMUNICATIONS.

Local Marine Boards.

Dear Sir,—In the very clearly written and generally instructive paper on Merchant Shipping Legislation, and inquiries into wrecks and misconduct at sea, which appeared in your last number, your correspondent has, I think, fallen into error on the subject of the constitution of Local Marine Boards, and as the proposed Merchant Shipping Code recommends alterations in the tribunals for deciding cases of drunkenness, exactly in the direction indicated by your correspondent, you may perhaps allow a little ventilation on these subjects. In the paper alluded to, the following assertions are made. "A Local Marine Board is elected by shipowners, and consists *wholly and solely* of representatives of shipowners." A reference to the 110th clause of the Merchant Shipping Act of 1854, will show that this is not so. The constitution of Local Marine Boards are in the Act stated to be as follows:—"The mayor or provost of the place, and the stipendiary magistrates, or such of them as the Board of Trade may appoint shall be members *ex-officio*, and the Board of Trade shall also appoint four members from persons residing or having places of business at the port, or within seven miles of it (not necessarily shipowners), and the owners of ships shall elect six members." Therefore it is clear that Local Marine Boards instead of being composed *wholly and solely* of representatives of shipowners, are by law only required to have half their members so engaged. Again when speaking of the tribunals held by Local Marine Boards, your correspondent entirely loses sight of the fact that these boards for purposes of inquiry, must always be assisted by a stipendiary magistrate, or a competent legal assistant appointed by the Board of Trade. Therefore such tribunals cannot be simply a tribunal of the employers trying the employed, as stated in this paper. (See clause 241 Merchant Shipping Act, 1854.) Having taken the liberty to point out these errors in your correspondent's statements, also having considered his very strongly expressed condemnation of such tribunals, you may perhaps allow me to state my opinion, which is that an investigation into misconduct or drunkenness conducted in a police court, will never receive the patient and careful inquiry into all matters connected with the performance of a seaman's duty in all its branches which marine boards as at present constituted invariably practice. It is also difficult to understand why, as your correspondent suggests, these inquiries should be sent to police courts, while those referring to wrecks or strandings, should be

taken out of them. A man accused of drunkenness or misconduct, is by English law, considered innocent, until proved to be guilty, and it seems likely to damage a character in no small degree to be arraigned in a public police court on such charges, even should there afterwards be an acquittal.

I am, Sir, your obedient servant, AN OBSERVER.

To the Editor of the Nautical Magazine.

[We willingly insert the above letter because it comes from a gentleman who we believe is a member of a Local Marine Board; and we are glad that our articles are read with interest and are "instructive." Our correspondent refers us to the Act of 1854, in order to prove that the Local Marine Boards are not composed wholly and solely of representatives of shipowners. He is right in quoting the Act, and we at once admit that where a stipendiary magistrate is a member of a Local Marine Board, he cannot be deemed to be a representative of shipowners. In all places where there are stipendiary magistrates they are *ex-officio* members, and our article would have been more accurate to have mentioned that fact. The point, however, is not a very important one, and did not affect the main point of our argument, considering that the nominees of the Board of Trade are, or have been, as a matter of fact, in the majority of cases shipowners. Dr. Johnson once made the following remark: "If I come to an orchard, and say 'There's no fruit here;' and then comes a poring man, who finds two apples and three pears, and tells me, 'Sir, you are mistaken; I have found both apples and pears,' what would that be to the purpose?" We think it is hardly to the purpose to dispute the general assumption in the article referred to. Because a body of shipowners have the assistance of a competent legal adviser in their deliberations, it makes that body none the less representative of the interests of shipowners. We agree with our correspondent that professional mistakes ought not to be tried at a police court, and this was the gist of the remarks on the subject in our article; but the most grave cases of this sort are tried there now, while cases of drunkenness are frequently tried by a Local Marine Board. The article proposed that cases of drunkenness and of a similar character should be taken to a police court, and professional cases to a professional court. We fear that our correspondent has failed to catch the distinction, since in his letter he still classes "drunkenness" with "misconduct," the latter, to our mind, involving professional points "connected with the performance of a seaman's duty." The article distinctly proposes to send these different classes of cases to separate tribunals.—ED. *N. M.*]

MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
25	Scotland—East Coast—Bell Rock Light.	Alteration in speed of revolution.
26	China—North Saddle Island light—	Further description.
	,, Yang-tse-Kiang Entrance—Tungsha Light.	Alteration.
	Blockhouse Shoal.	Establishment of a Beacon.
27	India—West Coast—Tellicherry.	Alteration in lights.
	Red Sea—Bab-el-mandeb Strait—Perim Island.	Period of attaining greatest brilliancy.
28	West Indies—Cuba—Cape Cruz.	Establishment of a light.
	,, Bahama Islands—Hog Island.	Establishment of danger light.
29	Cape of Good Hope—Table Bay—North Wharf.	Discontinuance of light.

(All bearings are Magnetic.)

NAUTICAL NOTICES.

25.—*Scotland—East Coast—Bell Rock Light.*—The speed of revolution of the red and white light is altered from a flash every two minutes to a flash *every minute.*

26.—*China—North Saddle Island.*—This light (Notice No. 12) is observed to the southward from False Saddle Island to Elliot Islands, or between the bearings N.W. ⅜ W. and E. by N. ½ N. The lower part of the tower is painted *white* and the upper part *black.*

China—Yang-tse-Kiang Entrance.—Tungsha light is a *revolving white* light *every forty seconds,* elevated 40 feet and visible 11 miles.

Note.—When the light is lowered for trimming, a small white mast-head light will be shewn, together with a flash light.

China—Yang-tse-Kiang Entrance—Block-house Shoal.—An iron screw pile beacon 20 feet high has been erected on the western part of this shoal in 4 feet water; from it Kintoan lighthouse bears S.W. by S. ½ S. Little Kintoan, W. by N. ½ N.; and Grass Island, N. ½ W.

27.—*India—West Coast—Tellicherry.—One* light is now exhibited instead of two. The light is *fixed white* 112 feet above high water, suspended from a flag-staff. Should be seen 8 miles.

Red Sea—Perim Island.—The new revolving light attains its greatest brilliancy *every minute.*

28.—*Cuba—Cape Cruz.*—A *fixed and flashing white* light of the second order has replaced the temporary fixed light. The light shows a flash *every three minutes;* it is elevated 114 feet and should be seen 16 miles. Position lat. 19° 50′ N., and long. 77° 44½′ W.

Bahama Islands—Hog Island.—The regulation is still in force which requires the exhibition of a *red* light whenever the state of the bar at the entrance of Nassau Harbour is such as to be considered impassable or dangerous to vessels entering. The light is hoisted at the flag-staff on the point near the light-house.

29.—*Cape of Good Hope—Table Bay—North Wharf.*—The red light hitherto exhibited has been *discontinued.*

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, IN APRIL, 1871.

No.	Scale.		s.	d.
1422	m = various.	Labrador, with plans of Port Manvers and Eclipse Harbour	1	6
2494	m = 8·5	Australia :—Lady Bay and Warnambool Harbour	1	6
2506	m = 6·0	Australia :—Port Fairy	1	6
502	m = 12·0	Barbados :—Carlisle Bay	2	6

GENERAL.

ROYAL NATIONAL LIFE-BOAT INSTITUTION.—A meeting of this institution was held on Thursday, 6th of April, at its house, John-street, Adelphi, Thomas Chapman, Esq., F.R.S., V.P., in the chair. Rewards amounting to £160 were voted to the crews of various life-boats for services during the storms of the past month. The Newcastle (Dundrum) life-boat had rescued the crew of five men from the brigantine *William*, of Londonderry. The Howth life-boat saved five men from a dredging barge of that port. The Holyhead life-boat was instrumental in saving from destruction the distressed schooner *Eliza*, of Pwllheli, together with the crew of five men. The Fishguard life-boat was the means of saving the crews of the *Ann Mitchell*, of Newquay, and *Carnsew*, of Hayle. The Yarmouth large life-boat brought safely into harbour the lugger *Echo* of Lowestoft, and the ketch *Equestrian*, of Port Gordon. The Ramsgate life-boat went out while it was blowing a heavy gale from E.S.E., and saved five men from the schooner *Lucie Antoinette*, of Nantes, which had gone on the Goodwin Sands, and which afterwards became a total wreck. The same life-boat, and that at Broadstairs, succeeded in rescuing the crew of fourteen men from the barque Idun,

of Bergen, which also became a wreck on the Goodwins. The Aldborough life-boat went out to the brigantine *Isabella Heron*, of Blyth, and succeeded in getting the vessel and her crew safely into Harwich harbour. The Newbiggin life-boat assisted to bring safely to land seven fishing cobles belonging to that place, which had been overtaken by a sudden gust of wind. The Fleetwood life-boat saved a soldier who had been overtaken by the tide. Various other rewards were also granted to shore boats for saving life from wrecks on our coasts. Sundry liberal contributions were announced as having been received. A new life-boat had been sent last month by the institution to Morte Bay near Ilfracombe. The boat, which is named the *Jack-a-Jack*, was provided by Bristol shipowners in the African trade.

THE iron-clad *Cerberus* which has been sent out from this country for the use of the colony of Victoria, has arrived safely at Aden, *via* the Suez Canal. No vessel of such broad beam, 45ft. at top and 43ft. at bottom, had previously been through the canal, but by careful navigation Lieut. Panter succeeded in taking her through, touching only three times. Lieut. Panter's intention was to steam up the coast about 600 miles, so as to get well to windward, and then steer for Galle. From thence he proposed to proceed to Padang on the coast of Sumatra, thence to Sourabaya in Java, and then to strike down south for Perth or King George's Sound. He states that the wind being south east, he would be compelled to make a long round.

A STRANGE story is told by Captain Ward, of the barque *Providence*, of Hartlepool. He states, that during his outward voyage to Dantzic, in November last, the ship sprang a severe leak during a gale in the Baltic, and his crew were all but exhausted in their efforts at the pump to reduce it. One day she suddenly stopped making more water, and eventually the vessel reached Dantzic. After the discharge of the cargo, a search was made for the leak, and a hole was discovered in the centre of a plank, caused by the yielding of a knot in the wood, but in the aperture was wedged a dead fish, which had effectually plugged the leak and thereby saved the ship.

WE understand that the Admiralty have informed Mr. Griffin, C.E., that they will not assist him in carrying out his project for raising H.M.S. *Captain*, but at the same time they so far encourage him by saying they will pay salvage for the vessel in the event of his efforts being successful.

THE Board of Trade propose to introduce into the Wreck and Salvage part of the Merchant Shipping Code the following regulations as to distress signals.

At Night.—The following signals numbered 1, 2, 3, and 4, when used or displayed together or separately, shall be deemed to be signals of distress at night:—

1. A gun fired at intervals of about a minute. 2. Flames on the deck (as from a burning tar barrel, oil barrel, etc.) 3. Rockets of any colour or description fired one at a time at intervals of about a minute.

In the Daytime.—The following signals, numbered 1, 2, and 3, when used or displayed together or separately, shall be deemed to be signals of distress in the daytime:

1. A gun fired at intervals of about a minute. 2. The Commercial Code Signal of distress indicated by N.C. 3. The distant signal, consisting of a square flag having either above or below it a ball or anything resembling a ball.

PLYMOUTH BREAKWATER FORT.—The first of our English iron fortifications has advanced another most important stage towards completion. The last armour-plate has been put in position, and the iron wall of defence is finished. What remains to be done is to concrete the roofs of the casemates, and to add the two turrets at the top of all. The iron casemates constitute an oval ring of three 5in. laminations, in all 15 inches thick, of rolled metal, the face only being of armour plates, and the other two layers of narrow bats, or planks, placed flatwise upon each other, and crossed at right angles, so that the whole structure is ruled throughout by numberless joints and intersections. In dimensions the oval iron fort is 143ft. 6in. on the major axis, and 113ft. 6in. on the minor axis, and its walls about 12ft. high; it stands upon a granite-faced basement, rising upwards of 10ft. out of the water at high springs; the ordinary rise and fall of the tide being about 15ft. Its situation is about a hundred yards behind the middle of the great Breakwater at the entrance of the Sound. It is pierced for eighteen 400-pounder rifled guns, not more than four of which can be concentrated on any given point. The whole work from the commencement has been going on for eleven years, and the iron portion has taken since 1868 to roll and erect. This main iron casemated fort now only requires roofing to be available for service.

ROYAL NAVAL SCHOOL, NEW CROSS.—We are glad to know that the council of this school have, on the application of several officers

of the Royal Naval Reserve, extended its advantages to the sons of those officers of the reserve, who hold wardroom rank in Her Majesty's navy. This is as it should be, for every step that tends to bring the officers of the Royal and Merchant navies to a better knowledge of each other is, we are convinced, a gain to the country, and this graceful act on the part of the Royal navy will not be lost on their brethren of the reserve.

An extensive scheme for the improvement of the Port of Buenos Ayres is contemplated, if not actually decided on, under that eminent civil engineer, Mr. Bateman, and the Admiralty have agreed to cause that part of the River Plate between Buenos Ayres and Monte Video to be re-examined, for which purpose Lieut. Dawson with assistants will shortly leave England.

Port Said is to be made a coaling station for Her Majesty's Ships passing through the Suez Canal and the Red Sea.

Mr. T. B. Johnston, of Edinburgh, has patented the idea of a "Treasure Safe for Ships." He proposes that the safe should be suspended from the ship's davits, ready at all times to be lowered into the sea, in the event of disaster; that all the valuables should be stowed away in this safe, and in case of its being necessary to abandon the ship, the safe might be easily towed astern of a boat. In the event of a sudden calamity, he also suggests that the safe might be so suspended as to unship itself from the davits, and float off to be picked up by some passing ship or washed ashore. The idea is good, but as yet it is in a crude and undeveloped state, and there are numerous difficulties which at first sight suggest themselves to its practical and successful realisation. We counsel Mr. Johnston to realise his idea practically, and if he can perfect a desideratum of such manifest importance, we believe he will gain the hearty support of the nautical world.

A project is on foot in Melbourne, Victoria, to organize, in conjunction with the other Governments of Australia, a monthly service of steamships between Cardwell and Sourabaya in Java, for the purpose of carrying telegrams, and thus bringing communication with England to within thirteen days, and,—when the line of telegraph is completed between Cardwell and Normanton,—to ten days, by the steamer taking her departure from the latter place. This is a great stride in communication between the two countries, and although direct telegraphic communication is proposed by October, the distance to be run by the steamers can be gradually

closed in until the direct communication is established. We are not quite so sure as to the non-interference by the natives with the proposed line from Port Darwin, but we admire the spirit that prompts the establishment of the proposed line, and hope that it will be carried out successfully.

The *Sultan*, 12, our last new armour-plated monster, has had her official trial trip which has been pronounced a success; she made a run beyond the Nab light, when her engines were worked up to seventy revolutions. The running on the measured mile produced a mean speed of nearly 14½ knots, with a horse power worked up to nearly 10,000, but we have always been of opinion that these trial trips are by no means indicative of speed for work-a-days. A ship, when comparatively light, drawing 26 feet water, becomes quite another thing with all her stores and equipment on board and drawing about 28 feet. As we have not given the dimensions of this great ship, we subjoin a brief account of her. Her dimensions are, as nearly as possible, the same as those of the *Hercules*—viz., length between perpendiculars, 325 feet; breadth extreme, 59 feet; depth in hold, 21 feet; burden in tons, 5,226 5·94; proportions of length to breadth, 5·5. An all-round fire has been held by all the advocates of turret vessels to be an essential element of success, and in arranging the armament of the *Sultan* great pains have been taken to give her guns advantages equal, if not superior, to those of turret vessels. The central battery on the upper deck carries at each of its projecting ends one 12-ton 9 inch muzzle-loading gun. The ends are each pierced with two gun ports, one looking out on the broadside, and the other across the ship's stern. From the broadside port the gun has a range of fire to within 37 degrees of the keel forward, and through the after port—the ship's sides rounding in sharply, and hammock nettings, and mizen rigging being set well on board—a fire is obtained from 4 degrees across the keel. The main deck battery is 87 feet in length, and has mounted on each side, on Captain Scott's patent carriages and slides, four 18-ton 10 inch muzzle-loading rifled guns, having a range of fire of 35 degrees each side of the beam. The turntables and after apparatus for transferring a gun from one port to another appear to be most perfect. The forward gun on each side through the recessed port has a range within 15 degrees of the ship's line of keel. The two 12-ton guns under the forecastle fire from 4 degrees across the keel forward to within 42 degrees of the beam athwartships. The central upper deck with its massive armour-plates had the effect of raising the weights a little, but this has

been compensated for by placing additional ballast in the hold. Steam is utilized on board the *Sultan* in steering by means of Forester and Co's. patent steam apparatus.

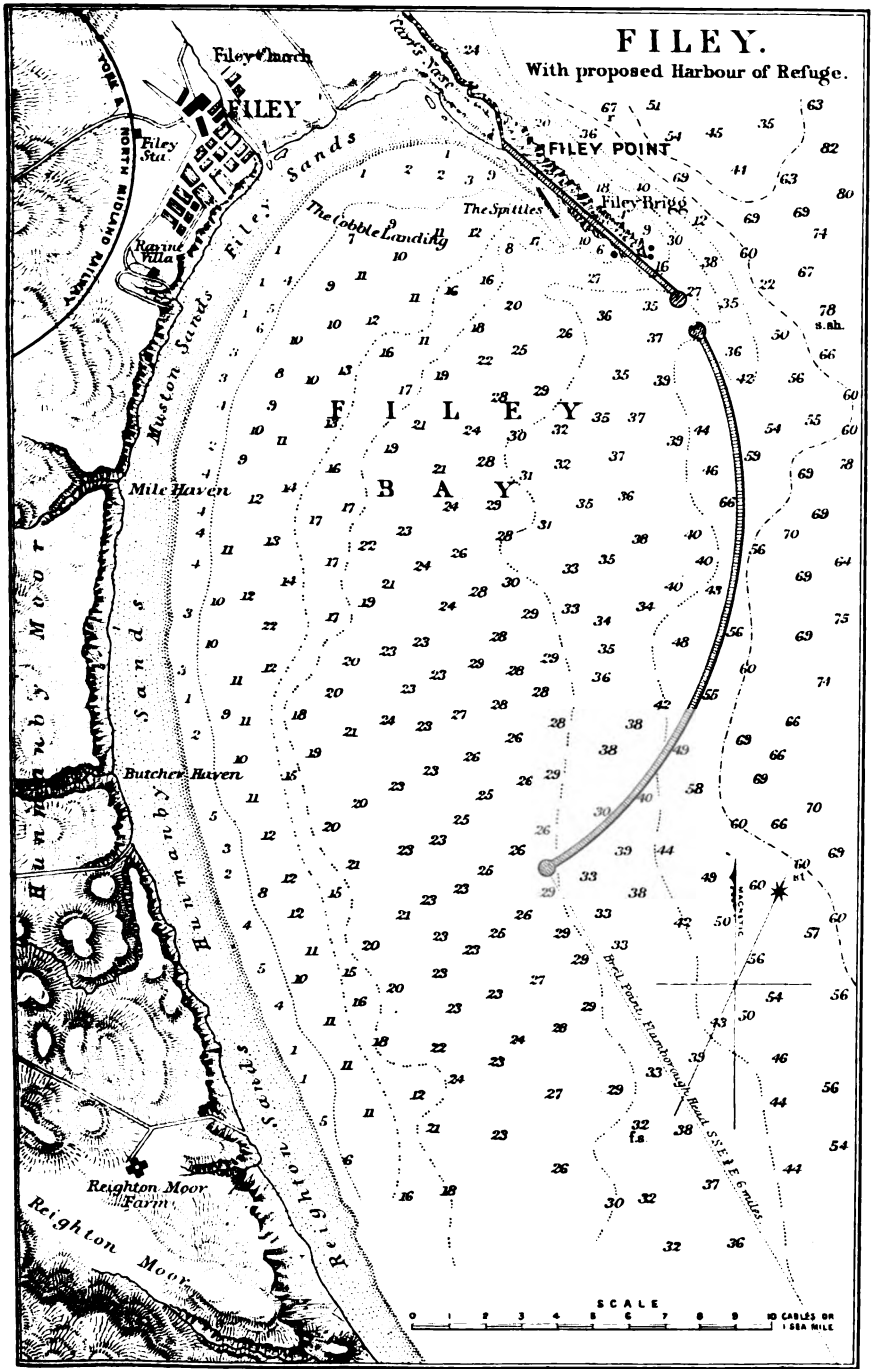
ROYAL NAVAL BENEVOLENT SOCIETY.—A general court of the Governors and Subscribers of the above Institution was held on the 17th ult., at Willis's Rooms; Admiral Goldsmith in the chair. The Secretary read the report, which stated that during the past year 39 members had died, and 32 new members had joined. The sum of £1,851 had been distributed in relief during the year to 259 applicants, being widows or orphans of deceased naval officers. The total income of the year, including the balance of £214, had been £2,428; and the expenditure, including the £1,851 in relief, and the purchase of £100 Stock, had been £2,283, leaving a balance of £145. The invested fund was now £43,634. The income for the past quarter, ending the 25th of March, had been £1,219, and the expenditure, including £455 in relief, had been £538, leaving a balance of £681. The report was adopted. The sum of £550 was then voted in grants to the widows and orphans of deceased officers. We cannot too earnestly recommend this Society to the attention of the younger officers of the Royal Navy, not as a charity to which they are asked to subscribe, but as a measure of common prudence, one that they may hope their relatives never may require to benefit by; but should that unfortunately be the case, they will have the satisfaction of knowing they will not be refused.

IT has been very properly determined that no more foreign officers shall be permitted to serve in the Royal Navy while so many of our own officers are unable to find employment.

CAPTAIN HALL the American Arctic explorer is about to start on another expedition to the north in a vessel now preparing for him. Dr. David Walker who accompanied Sir Leopold McClintock, in his memorable voyage in search of Franklin, in the *Fox*, sails with Captain Hall, and we believe the route the expedition will take is that of Captain Hall's countryman, Dr. Kane, known as the Smith Sound route. We hope that Captain Hall will be enabled to set at rest the somewhat doubtful problem of the open Polar Sea as seen by Morton and Kane.

A LIGHTHOUSE is to be placed on Galley Head, on the South West Coast of Ireland, which will, it is hoped, aid in preventing the recurrence of wrecks in Clonakilty Bay and the adjacent neighbourhood.

HOLMES'S INEXTINGUISHABLE MARINE AND STORM SIGNAL LIG
We are much mistaken if this invention will not create a revo
in certain signal and other lights in use both in Her Majesty'
the Merchant Navy. We have had the opportunity of witn
the light, and if in actual practice afloat it retains the same prop
as exhibited to us, we consider the value of the invention an
extent of its adaptation cannot be over- estimated. As the magn
light throws that of gas into the shade, so does the light und
notice throw that of blue-lights, port fires, and other lights
as signals, and when we state that ordinary newspaper print c
read at a distance of fifty to sixty feet by its light, it may give
idea of its intensity. The light as at present constructed
forty minutes, but this we suppose can be regulated by the s
the chamber and the charge of the compound; it is lit by
of bringing water into contact with the compound, and, ther
water being necessary to its combustion, the light cannot be
guished by it. The uses of the light have to be developed
some are apparent to our nautical experience, viz.: as sign
distress for a pilot or tug, illuminating the coast for landing
wreck, directing life-boats in connection with the Rocket line
ratus to indicate the position of the falling line, life-buoys, a
pitch dark and rainy nights for illuminating the ship while r
or performing any other evolution. In construction the machi
producing this light is as follows: A small tin canister, four
high and three inches in diameter, is fitted upon the upper sid
a conical nozzle burner for the emission of the flame. A tube
through the centre of the case which projects some three inches
the under side, the portion of the tube within the lamp is perf
with holes to permit water to flow in to the interior of the lamp.
the nozzle hole and the bottom of the table are rendered air-ti
soft metal caps soldered on. The interior of the lamp surrou
this tube is charged with the preparation consisting of lime b
with a certain proportion of phosphorus in a closed crucibl
high temperature. This material broken into small lumps fi
lamp. To prepare the light for use is only the work of t
three seconds. With a knife cut off the soft metal top
nozzle, and make a hole in the bottom of the tube suffici
admit water freely. The lamp is now ready, and will, when
in water, burst forth with an intensely brilliant flame, not
extinguished by wind or by water.



THE

NAUTICAL MAGAZINE.

NEW SERIES.

JUNE, 1871.

A HARBOUR OF REFUGE AT FILEY.

"Words, mere words," is all that came of the discussion in the House of Commons a few months since as to the necessity for a Harbour of Refuge at Filey; and in the interests of the vast and increasing trade up and down the North Eastern Coast, we feel it a duty again to call attention to this great want. The result of the division on Lord Claud Hamilton's motion was one that must be deplored by all who are interested in the safe navigation of the seas adjacent to our shores. Certainly many honourable members urged with earnestness and force that a harbour was wanted, but, on the other hand, many gentlemen spoke ignorantly and injuriously against the proposal, and, strengthened by the indisposition of the Government to grant the necessary funds, the humane project was defeated. The nature of the proposal so unwisely rejected is such that it ought not to have been made a party question, and although the *Nautical Magazine* has no political bias, yet we cannot refrain from condemning what seems to us to be misdirected economy on the part of the present Administration. The question resolved itself into one of money only, and the Government, which is prepared to expend upwards of fourteen millions for abolishing purchase in the army, grudges something under one million for an undertaking of such imperial importance as the establishment of a harbour where it would be so exceedingly advantageous.

We are at a loss to understand how the Government can justify their refusal of the necessary funds, having regard to the recommendation of the Royal Commission of 1858. To what end was

the Commission appointed if no action were to be taken on their report? No gentlemen ever met together on whose judgment more reliance could be placed than those who formed the Committee over which Sir James Hope presided. So vast was the subject the Commissioners had to enquire into, and so many were the propositions they had to listen to from parties interested for particular localities, that the greatest discrimination, together with practical and scientific knowledge was necessary to arrive at just and safe conclusions; that this was done has been generally admitted, and although the proposals submitted by them involved a vast sum of money as a whole, and in consequence grave financial considerations, still on some points the recommendations of the Commissioners were more earnest and considered more pressingly necessary than others, and in no case were their representations stronger or more earnestly put than that a National Harbour of Refuge should be constructed at Filey.

But thirteen years have passed and successive ministries have throughout ignored the recommendation for the benefit of navigation, while their efforts have been mainly devoted to producing sensation budgets and large surpluses. As a question for the benefit of humanity, we cannot bear to see it smothered; it is a far greater matter than the reduction of a halfpenny in the income tax, or the repeal of the duty on pepper or tea, and it will, we prophesy, make its voice heard from time to time as heartrending accounts reach us of fierce south-easters driving helpless vessels to destruction on the dangerous shoals which are scattered all about the dreary length of our unprotected North Eastern seaboard.

We do not suppose we shall add much that is new to the consideration of this subject, but if for no other purpose than of re-opening the question, we now propose to offer a few remarks as to the applicability of Filey for a Harbour.

On examination of the evidence given before the Commissioners in 1858 (evidence commented on by the Commissioners in their report as being given by "thorough seamen and highly intelligent men"), one cannot fail to notice the absence of local influence and interest brought to bear in favour of Filey, and beyond an appeal from a few fishermen naturally interested in getting protection for their boats near their homes, all the evidence bore on its *national* and not *local* importance. The details of ships wrecked, and the loss of life in the neighbourhood differed materially from that given at other places, although the Board of Trade wreck returns are by no means silent as to the losses on this part of the coast. In two gales, property was lost to the value of upwards of £100,000, and

lives, which no money can value, in number 109, and as many as thirteen wrecks have taken place in one day. But it is not in the number of wrecks that have occurred in the immediate vicinity of Filey that the proof of the necessity for the harbour lies, it is rather in the negative argument of what wrecks would have been avoided along the whole coast had such a harbour been in existence. Other places in the vicinity were proposed and considered with the same view, but all the evidence went to prove that on that great range of coast extending from Harwich to the Frith of Forth, at no point would a harbour of refuge be more usefully placed than at Filey, and that this was the conviction the Commissioners arrived at is sufficiently proved by their recommendation that a sum of £800,000 should be devoted to the purpose, and by their describing it in contradistinction to other proposals as a *national* harbour of refuge.

Some little of the evidence went to prove the utility of the proposed harbour as a port of safety, of rendezvous, and coaling for the Royal Navy, and there is much to be said in connection therewith, but for the present we prefer to consider it solely in its connection with our great coaling and Baltic trade, leaving the consideration of it in regard to the Royal Navy as a secondary and subsidiary point.

We cannot see that since the opinion of the Commissioners was given circumstances have at all altered to lessen the necessity for the proposed harbour, although this plea was strongly urged by the opponents of the proposal. Had some great substitute for coal as fuel been discovered which had caused the abolition or annihilation of the coaling trade, we could have imagined that such an argument might have had some weight; but our trade returns tell an opposite tale, shewing a yearly increase in the consumption and an increased number of carriers. The lessened necessity was partly based on the increased number of vessels employing steam power, as carriers, and on the Bill then about to be introduced for the better regulation and consequent greater safety of our merchant navy. We may certainly admit the fact of a larger number of steamers now employed in the coaling trade, but can we, on the other hand, point to a decreased and decreasing number of sailing vessels? and is the old established saying, that when a vessel is fit for nothing else she is "only fit for a collier" of no truth in these days? If not, then as far as safety for our sailing coal fleet is concerned, the necessity for a harbour of refuge is now as great as when the Commissioners made their recommendation. If the new Merchant Shipping Code grapples successfully with all the evils of unseaworthy, undermanned, badly found, and perhaps overinsured

ships, it will do more than we expect, but as long as underwriters can be found to insure, and sailors can be induced to ship in, any tub that will float, so long will the great necessity for the harbour of refuge remain. Moreover, although legislation may do much to assist in protecting life and property, yet it cannot stop the gales that drive hundreds of well found vessels into danger, or cause them to bear up and run long distances out of their course.

In the arguments advanced against the proposition, a great deal was made of its being a local application of money, and the question was raised why Filey should be favoured more than Hartlepool, Newcastle, the Tyne, Whitby, or other places?

Probably the gentleman who took this view did not consider that additional improvement for a port already established with a trade of its own would not only be local but personal, as putting money into the pockets of those already making money in the place. This can hardly be said of Filey, which has no manufacture, no coal, in fact, nothing of which other ports could be jealous, indeed it would seem that such a harbour as is proposed would be most desirable to them as affording an additional safeguard for their own property, and the lives of the men they employ. Tyne *versus* Hartlepool, or Tees *versus* Wear would be different, but any of these places *versus* Filey seems to us rather absurd. We were somewhat surprised to find a member for a Port which would be more benefited by the proposed refuge harbour than almost any other, arguing against it on the plea that it would be better policy to develop harbours for the purpose of commerce and refuge instead of constructing them for refuge—as if a harbour at Filey would not tend to develop commerce by shortening passages and ensuring safety. It was also argued that Sir James Hope's Commission selected several places, and that Filey was only one out of twenty, but of none other of the twenty—if twenty there were—did the Commission say what they did of that one, viz., that the "preponderance of evidence was in favour of a harbour at Filey, as that which would prove most conducive to the saving of life," also, "as the benefit accruing from this proposed harbour will be confined solely to the passing trade, it would be purely national." However competent the gentlemen who opposed the motion may have considered themselves to form a judgment on the subject, we should be much more inclined to follow the well known men who composed the Commission, and the "thorough seamen and highly intelligent men" who, from experience, gave their evidence in favour of the proposal; and we may safely affirm, that not one of the opposers were ever caught in a winter south-easterly gale off Flamborough Head.

Cabinet ministers and honourable members talked about this matter as though they had been cruising up and down the north-east coast all their lives, but the opinion of all practical seamen who know that part of the coast is that a refuge harbour is absolutely necessary, and that Filey Bay is the best place for it. A glance at the chart shews it, there are no outlying dangers, the land is high and easily seen, steep to, it is protected from the south, west, and north winds, a natural breakwater from the point runs out as though nature had began the work, leaving man to finish it. For the whole three hundred and twenty-eight miles from Harwich to the Frith of Forth there is no safe harbour to run for. It is true that the Tyne has been much improved of late years, but in bad weather it is still very dangerous, and many masters of vessels will run for the Frith of Forth, a distance of ninety-seven miles, rather than try the Tyne. The Humber it may be said is available, but masters of vessels know too well that there are sands extending off both shores for miles, on which a tremendous sea breaks in bad weather, and, notwithstanding the admirable guiding marks at the entrance of the river, they are not readily picked up on account of the land being only just above the level of high water.

We annex a small chart, shewing a breakwater which we believe might be constructed at a smaller cost than has been stated. There is plenty of stone in the immediate neighbourhood, and with a judicious use of convict labour, the work might be economically carried out. The shape of the breakwater suggested in our chart seems well adapted to the requirements. The sea would break more easily upon it than upon a straight one, and inside there would be room for an enormous fleet, as well as for the largest vessels. There would be a uniform depth of water at the breakwater of nine fathoms gradually shelving into the shore for a distance of a mile and a half. If required to beach a vessel there is an excellent sandy beach. The holding ground is good, and there is very little tide. By making a northern entrance, as shewn on the chart, vessels running before northerly gales would be enabled to go in to windward, and the master could choose his own berth without fear of getting to leeward.

The question of money is no doubt the difficulty in the way, but it is a difficulty that ought not to exist in our wealthy and civilized country. We therefore urge our readers, and all interested in navigation, not to accept the result of the recent division as fatal to the project, but rather as one step towards the successful carrying out of this great national undertaking, and to use all their endeavours to bring about so desirable an object as early as may be possible.

JAMES KENNEDY.

A Tale of the War Time.

By JAMES B. KENNEDY, Lieutenant, R.N.R.

In Eight Chapters.

Chapter V.

Many interesting episodes are recorded in my father's journal, and which were of more frequent occurrence, from the fact of his ship being one of the in-shore squadron, it was almost a daily occupation to stand close in to Brest and obtain a good view of the French fleet, while the forts tried the range of their guns at her. A lieutenant, whom my father designates as "the limner," was attached to the *Clyde* and made some beautiful drawings of the coast of France,* and my father, who seems to have been a handy man on all occasions, often carried the "limner's" drawing utensils into the main or fore top and attended on him while he was making his drawings.

On the 11th August, 1800, they gave chase to a vessel, but another hove in sight that looked of a doubtful character, so they left their first love and crowded all sail after the second, who ran from her, standing in shore hoping doubtless to get in with the land and get away under cover of the night, but the wind fell light and the night being clear they kept her in sight with the night glass, and at two in the morning brought her to with a gun. On coming up with her, Captain Cunningham hailed her in French and asked where she came from, and where she was bound; the answer was from Havannah to Brest, and she enquired in return if the *Clyde* was a French frigate, which was answered in the affirmative, but it was evident she doubted the truth of that, for she was observed to be clearing away an anchor and lashing bags to it; the marines were ordered to fire to prevent them, but although the firing was kept up it was of no use, for before a boat could get alongside, the anchor was let go, and as they soon found out, the mails she was carrying were attached to it. Of course they made a prize of the vessel, and three thousand dollars found on board were served out at the capstan head.

In October, the *Clyde* was refitting at Plymouth, and on the 1st January, 1801, a Royal salute was fired, and new colours and standards hoisted in honour of the Union with Ireland. On the 11th, Admiral Lord Nelson hoisted his flag on board the *San Josef*,

* These beautiful drawings, by Lieut. Serres, are now in the Admiralty.—*Ed.*

in the harbour. During the month they were "pressing" very hot, and in spite of all protections, and by the end of February the *Clyde* was again at sea and on her old station off Brest.

On the 28th April, being off Brest, with the *Boadicea* and *Unicorn* frigates, and a cutter in company, the wind being off shore, the *Clyde* beat up into Camaret bay, which is close to the entrance of Brest, and in which, lying at anchor, were two large French frigates. The *Clyde* passed within the cross fire of the forts, but they did not fire, hoping to get the frigate so close in that escape would be impossible, and evidently with the same view one of the frigates got underway and stood out, but did not approach the *Clyde* within fighting distance. At this time the other vessels were so far to leeward that no assistance could be expected from them, but notwithstanding, the *Clyde* beat to quarters and cleared for action. The French frigate then rounded to and fired a whole broadside at the *Clyde* but not one of the shot struck her, at the same time two of the batteries opened fire with shot and shell, both passing over the ship and dropping around her, but without hitting her; the other French frigate then weighed, but the *Unicorn* coming up, the two little frigates formed in line of battle and waited the foe, but the Frenchmen seeing the determination of the English frigates to fight, hauled off and returned to their anchorage.

This gallant attempt of Captain Cunningham to engage the enemy was followed up the next day, the *Clyde* with three frigates under his command formed in line of battle off the harbour's mouth, hoping to draw the French frigates out, but all their allurements were in vain.

On the 21st July, the 36-gun frigate *Jason*, Captain The Hon. James Murray, struck on a sunken rock in the bay of St. Malo, the officers and crew were all made prisoners. The intelligence of this misfortune was first received on board the *Clyde* nine days after the occurrence, that ship being then at Guernsey, she immediately started for St. Malo, and standing close in, could plainly see the hull of the unfortunate ship lying on her broadside with her starboard gunwale under water, and all her masts gone; the next day, 1st August, the *Weasel* brig was sent in with a flag of truce to make enquiries concerning the fate of the crew; the French sent a boat out and met that of the brig, and both, after calling alongside a French frigate, repaired to the shore, and then returned with the information that the officers and crew of the wrecked ship should be sent out, and on the 3rd, they were sent off in three cutters, with the "Cartel" flag flying. The officers in command of the cutters, after dining with Captain Cunningham, returned to the port.

The French did everything they could to save the hull of the wrecked ship, but the English vessels at every opportunity hindered them, and as my father remarks "it was not much good they got out of the *Jason*." On the 5th October, the pleasing intelligence of peace between France and England reached the *Clyde*, and which was officially confirmed a day or two after.

I will quote another and quaint extract from the journal. The *Clyde* was at Guernsey. "Saturday, 31st October, 1801, weather "fine; the *Cockchafer* joined us; we had also the intelligence that a "boat belonging to the *Insolent* gunboat had been stove on a rock, "the captain and three of the boat's crew were drowned; the purser's "daughter was in the boat, and one of the men got her on his back "and swam for a great distance, at length finding her clothes getting "wet and heavy, he told her if she would consent for him to undress "her, he would save her life; but vertue would not let her consent, "she would rather suffer death. He continued to swim with her on "his back; at length finding his strength quite spent, he was obliged "to leave her to the mercy of the waves, and had the shocking sight "of seeing her sink. Had she consented for him to pull off her "clothes, he would have saved her life. Vertue is great, but still I "think life is more so.—Nothing more."

In August, a Royal proclamation was promulgated through the fleet calling upon all deserters to give themselves up, whether serving in the fleet or not, promising pardon and offering to take the "R" off all the names of those who did so. My father was one of those who took advantage of this, and gave in his name as one having deserted from the *Impregnable;* he also stated the pursers' names he had served under. I know that he served under the name of "James Long" in several ships, but I forget which they were. To obtain the full benefit of the offer of Government, it was necessary for the deserter to produce a certificate from some officer of the ship he had deserted from, otherwise the "R" could not be taken off his name, nor would he be able to count his time previously served for pension.

When the *Clyde* was at Plymouth after my father had given in his name as a deserter, he found that an officer of the *Impregnable* with whom he had sailed, was a post captain, and was living in the neighbourhood; he therefore called upon the captain and asked him to give him the certificate, stating that he served in the above-named ship with him. The captain denied all knowledge of having ever seen him before, and declared it impossible that he could have been in the *Impregnable* at the time he was, or he must have known him. After trying some time to convince the captain, my father reminded

him of the circumstance of his having passed the end of the signal halliards into the top to him when they had been shot away during the action of the 1st June. (The officer was above the rank of master's mate at the time, but I called him one, as I do not wish to point out who the person was.) The captain then recollected him, and opening the door, called loudly, "John, John, bring me a horse-whip!" John soon appeared with a good stout whip, which he handed to his master; the captain took it, and said to my father, "Now you scoundrel, you not only think proper to desert from one of H.M. ships, in which I had the honour to serve, but you have the impudence to come to my private residence and ask me to give you a certificate to enable you to get the 'R' taken off your name, instead of a certificate I'll give you a devilish good horse-whipping!" My father suddenly jumped to the door, locked it, and put the key in his pocket, then as suddenly seized the captain by the throat, and took the whip away from him, and then said to him, "Now, sir, not only did you tell a lie in saying you did not know me, but you have thought that you could with impunity horsewhip me; now if you do not at once write me the certificate, I'll horsewhip both you and John till you do, and I will leave you such a token, that when I call again you will not have so much difficulty in remembering me." The certificate was quickly written, and my father carried it away with him, and the "R" was taken off his name. I am not aware whether the Gallant Officer (the Captain) ever told the story or not.

Chapter VI.

The journal carries the time on till 1802, when the *Clyde* was paid off. My father then went to his family in Scotland, and finding his elder brother settled at Cambernauld as a weaver, he bound himself an apprentice to him, being desirous of leaving the sea and turning weaver. About three months after he had settled down on shore, he was drawn for the militia, and to save himself from serving as a soldier, he told the magistrate that he was a sailor, and they forthwith forwarded him under escort, to the Tender in Leith roads. He jumped overboard one night from her and swam to shore, and worked his way across country to Greenock, where he shipped in the *Mercury*, of Kirkaldy, a privateer, going under "Letter of Marque" commission to America, and to cruise. He left the privateer in New York, and took out letters of naturalization, determined to give up the sea and turn Yankee.

In a little while he again went to sea as second mate of an American ship, which went to Port Antonio, in Jamaica. While lying there an English sloop of war came in and sent her boat on board to purchase stores, potatoes, etc. My father, in the approved Yankee mate's costume of that day, red flannel shirt with white frill, gold ear-rings, and curled hair, passed the man-ropes to the lieutenant and received him. When he came on deck, "Hillo, Kennedy, my boy," cried the Lieutenant, "I am glad to see you, how are you?" "I calculate you're wrong, master Lieutenant," replied my father. "My name is Long, I'm a native of the State of New York, and have my protection with me." "Bother all about that," said the Lieutenant, "you and I were not shipmates in the *Clyde* frigate for five years to forget one another so soon; into the boat with you." Remonstrances were useless, he was taken on board the sloop of war, *Marion*, and the captain of the American ship was compelled to give up his effects, under the threat of having his topsails unbent and taken as a substitute for them.

He had been on board the sloop of war several weeks persisting in saying that he was not the man that Lieutenant Bell took him for, but being at the wheel one night the captain took him by the beard, saying, "Why do you wear this like a billy-goat? Why don't you shave yourself like an Englishman? acknowledge yourself to be the man Mr. Bell says you are; and I will give you the same rating as you had in the *Clyde*, and also get the 'R' taken off your name." "Well, Sir," says my father, "I am the man. I was a petty officer on board the *Clyde* with Captain Cunningham."

"You are the man, are you?" said the captain; "I'm very glad you told me so, for I have an order to give you up, on account of the noise the American Consul has made about you in Kingston."

This sloop of war was either wrecked, or condemned, or burnt, somewhere in Jamaica, and my father next served under Admiral Dacres, in the *Hercules*, and then in the *Theseus*, being captain of the forecastle in both ships. He distinguished himself very much in the hurricanes in which those ships suffered, and in consequence was made a warrant officer from one of them into the *Orquijo*, an 18-gun sloop, that had been captured from the Spanish off Havannah, by the *Pique*, and had been retained in the service.

He served with credit in her, particularly in an action with a heavy Spanish frigate (a galleon) from the Havannah. In manœuvring about the Spaniard's stern, the sloop of war's weather fore topsail sheet was shot away, and she came to against her helm, and was in danger of falling on board the frigate; if she had done so, from the number of men on board the Spaniard, she would have been cap-

tured. The topsail sheet was cut through by a round shot a few feet outside the quarter block under the yard, and was unrove from the yard-arm, but the end was hanging through the clew block. My father ran out on the fore-yard, caught hold of the end of the sheet, and hauled down on it till he got a turn under the yard-arm, then hauled away and took in the slack and made fast, so that they were enabled to haul the fore-yard "abox," and "box" the ship off. The fore-yard arm was within fifty feet of the frigate's stern, and as many men on board of her as could bring a musket to bear on him were firing at him, but he came down unhurt.

This sloop of war foundered on the north side of Jamaica, she, with other ships were collecting a convoy. Sir James Alexander Gordon was the commodore in the *Port Mahone* brig. The captain of the sloop was on board the commodore's vessel, a heavy squall struck the ship while the crew were on the lower deck at dinner and she filled through her ports and hatchways. The captain, the master, and my father were the only officers saved, the whole crew, except thirty-two (saved by the *Mahone* brig), were drowned. My father told me that he remarked to the officer of the watch before he went below, that there was a very heavy squall coming. He answered that it was not likely to hurt them much, as the top gallant sails were furled, and a reef in the topsails.

My father's cabin was abreast the after hatchway, he went below, pulled off his jacket and waistcoat, and took his day's spirit from his servant, and mixed himself a glass of grog; while drinking it he heard the roar of the "tornado," coming down on them and instantly jumped up the hatchway and got on the upper deck just as she fell over on her beam ends. He caught hold of a rope and hauled himself up to windward, and got on to the weather bulwark, where in a short time several other people collected; he was in the act of cheering those nearest to him up, by saying, "The ship cannot go any further, the *Mahone* will pick us up, as we picked up the crew of a ship the other day;" when the sloop rightened and went down, blowing out of her hatchways like a Grampus.

He went down with the ship till he describes it as getting dark over his head. He felt very much exhausted when he came to the surface.

"Here you are, Kennedy," cried a voice, "look out," and he felt a rope strike him across the shoulder, which he caught at with the desperation of a drowning man, and hauled himself more by instinct than reason, until he felt a firm hand clutch him by the shirt collar and raise him, so that he could get hold of the spar, a studding sail boom. "Thaunk God you're safe mon," said the master, for it was

his voice he had heard, and his hand had thrown the line. "Thank'ee, sir," said my father, "but I fear it is only for a time, and a very short one too, for this boom won't support us all." There were three negroes on the spar besides my father and the master, the old master must have been a brave man, for when he threw the rope he must have known the spar would not support another, but he did not hesitate a moment, and the clutch at my father's collar might have been a clutch resulting in his own death. The master was a fine rough spoken old sailor man, who had been in the merchant service, but notwithstanding a rough exterior and an unservice-like way of speaking to the men, he was generally liked, and although the younger officers affected to look down upon the old man they held him in great respect, and the captain generally gave in to the opinion of Mr. Mercer. When blowing hard and the hands were up reefing topsails, the old man would take the wheel and keep the topsails so gently lifting, that the first lieutenant used to say that when the master was at the helm, he half reefed the topsails himself.

No one knew anything of the master's history, he was supposed to be married, as he often spoke of "My Tom," who was a kind of wonder, for when anything clever was done he would quietly remark, "Au, my ain Tom cauld na ha' doon it better;" or when a man went clumsily about any work he was ordered to do, Mr. Mercer would say, "Gang yer gate mon, my Tom wad teach ye how to do it."

"Kennedy," whispered the old man, "this canna last lang, I ha' my doots if the *Mahone's* boats will reach us in time, and those niggers are glow'ring at us as if they would prefer yon shark picking our banes instead o' their ain; if that fellow comes nearer ye, gie him the first clutch." "Aye, aye, sir," said my father, who always obeyed orders, "I'll keep my eye on him." "But, Kennedy, my laddie, just ken what I ha' to say to ye, for may be ye may be the last I may ha' to say a word to, for it will be better for the auld mon who has nearly served his time to go, than the hale and young; but God help my puir wife and bairns, an ye will promise to take a message to them, Kennedy, my braw lad, I shall dee happier." "I will sir, though I should have the world to go over to find them," replied my father, "but cheer up, sir, I will stick to you to the last, and as I am not married and have no one in the world to care for me, and no one will miss James Kennedy, if the worst comes to the worst let me go, sir." "Na, na," replied the old man, "ye'el do as ye're ordered, ye ken that as lang as a stick remains of the auld craft, ye maun obey your superior officer, and this is a stick of her; but if ye will just gang and see Mrs. Mercer, at 14, Chepstow-street, Soonderland, and tell her how I deed, and that to the last I was a true man to

her and my God, to whose care I leave her, is all I'll ask ye; and as to Tom, he commands a braw brig oot o' Soonderland, an ye see him, tell him to haud close to his mither, and remember the advice I aways gied him, and ne'er to steer by anaither mon's compass. Gie us ye're hond, my boy, and now guid bye, God bless ye." My father suspected that he was about to loose his hold, as it was with difficulty they could keep their heads above water, when a sea came and washed the negro at the other end of the spar off. My father coolly remarked, "That was a great relief," but still the spar was too heavily weighted, when another spar not so weighted, drifted towards them. "Hold on, sir," said my father, "I'll strike out for that spar." "Na, na, ye haud on, I am fresher than ye," with that the old man let go and struck out and reached the spar. "All right, Kennedy," cried he, "if the boats are only quicker than the sharks, we may be all saved yet. I ken the fin o' ane o' the brutes a spiering round us for some time." They could see the boats of the *Mahone* and the men giving way for their life, and a man in the bow of the foremost waving his hat to cheer them and let them know that they were seen.

The boat was not a hundred yards from them, when a yell from one of the negroes, and a loud splash told the tale that he had been seized from beneath by a shark, a moment after and a stream of blood ascended and coloured the water all round, and at the same time the other negro let go his hold, rose to the surface twice, tried to grasp the spar, and then went down, leaving my father sole occupant (if it can be so called) of the studding sail boom; the splash of the oars of the approaching boats soon frightened the sharks off, and both my father and the master were saved, although much exhausted when taken into the boats.

I may remark that my father, if not guilty of an untruth, suppressed the truth, for was there not *one* who cared for him in the world? Yes! and he knew it full well, there was at least *one*, who had he gone, would have been broken-hearted, a young woman in the fair gardens of beautiful Kent, to whom he was betrothed, and who was afterwards my very dear mother. If the recording angel of "Sterne" is still in existence (and I suppose he is), and has the same tender pitying eye, a tear from which obliterated the oath that in a good cause proceeded from Uncle Toby's lips, if he, I say, recorded the lie that fell from my father's, surely I may take it for granted that a tear from the same sympathizing eye again dropped, and "blotted it out for ever."

The rescued officers and seamen were shortly afterwards landed at Port Royal.

(To be continued.)

MARINE STEAM ENGINES.

HINTS TO MASTERS AND MATES—*(Continued).*

Stays. The stays in a boiler are most important and ought to be proportioned and arranged with great care and judgment, as upon them so much depends the safety of the boiler when there are flat surfaces. The substance of the stays ought to be considered in some respect in reference to the thickness of the plates; the pitch of the stays, or the distance they are placed apart, and their dimensions, must therefore be in accordance with the amount of pressure that the boiler is intended to be worked at. The stays should be very carefully arranged, so that when steam is up each square inch of sectional area of stay shall not have more than about five thousand pounds strain upon it; but where the plates are subject to the direct action of the fires very great and special care must be taken that the stays are placed closer, since all plates subject to direct action of flame or fire are liable to buckle and become damaged. There are various ways of securing the stays, such as screwing them and having nuts on the stays on the inside and the outside of the boiler, or screwing them into the plates, with nuts on the stays outside; also screwing them into the plates and riveting them outside of the boiler, which is a common method in the furnaces. In the furnaces the stays ought to be much closer than elsewhere, but they are reduced in substance. There are also stays that are fastened to angle or T iron, the angle or T iron being riveted to the shell of the boiler. We will mention one other method—those secured to eyes screwed into the shell, and either riveted or nutted outside. Each method has its own particular advantage or disadvantage. For instance, those that are moveable are not all so likely to have an equal strain, and from the fact that the pins may not fit exactly, the stays may not be all exactly of the same length, etc.; but, on the other hand, they are easily removed for cleaning or repairing. Screwed stays can be put in so that all of them have about an equal amount of strain, but they cannot be removed for cleaning, etc. When stays are bolted or riveted to angle or T iron, care should be taken that the aggregate strength of the bolts or rivets used is equal to or exceeds the strength of the stays; otherwise the stays will come away from angle or T iron, or the angle or T iron will come away from the shell of the boiler. This is a point frequently rather overlooked by boilermakers.

Valves and Cocks. Safety Valves. The safety valve ought to be made of brass, with a flat or conical brass seat fixed on the boiler, and is so arranged that when the steam in the boiler gets to any given pressure the valve will lift, and thereby allow the steam to escape. Often a very useful and judicious arrangement is made, so that the valve can be lifted by hand when the steam has not got to that pressure at which it would lift the valves. In all cases it is well to have lifting gear fitted, as by it an engineer can always be sure that the valve lifts and is in working condition. If the valve does not lift, it is apt to set fast; and if it set fast, instead of being an element of safety, it becomes an ever-present and fearful element of danger. The size of the valve ought to be regulated in accordance with the generating power of the boiler, and the lift of the valve in accordance with the diameter of the valve, so that the space between the edge of the seat of the valve and the cover or valve that is lifted, is equal to the area of valve. It is well to have two valves on each boiler instead of one, in case one valve should "set fast." In most cases where two valves are used, if each valve has an area of nearly half an inch for every square foot of fire-bar surface, it will be found quite sufficient. It is always better to have a number of small valves than one large one.

Reverse or Atmospheric Valve. The reverse or atmospheric valve is fixed on or near the top of the boiler, and is so called from its opening inwards by the pressure of the atmosphere when a vacuum or partial vacuum takes place in the boiler, which will occur if the steam is allowed to go down and the boilers cool without any cocks or valves being opened; then, so as to prevent a collapse, or straining of the boiler from the pressure of the atmosphere outside, the reverse valve opens by the pressure of the atmosphere and so admits the air into the boiler, and when the pressures inside and outside the boiler are nearly equal the reverse valve will shut. A very small atmospheric valve is all that is necessary.

Communication or Stop Valves. The communication or stop valves are on the upper part of the boiler, and should be placed between the boiler or superheater and steam pipe, and directly on the boiler or superheater—if there is a superheater,—and are so fitted that they can be opened or shut by hand, so as to let the steam into the steam pipes leading to the engines, or confine it in the boiler. They are also used for letting steam from one boiler to another, and from the boiler to the superheater, where there is a superheater. Sometimes the safety valves have been placed on the steam pipes, which should not be done, but directly on the boiler as stated before. When this is the case care should be taken that

a stop valve is never placed between the boiler and safety valve; too much care cannot be taken in this respect, also in seeing that there is a safety valve on the superheater, more particularly if the communication between the boiler and the superheater can be stopped.

Feed Cocks and Valves. The feed cocks and valves are generally placed a few feet above the bottom of the boiler, and serve to regulate the supply of water to the boiler in accordance with the distance that the cock is opened. The valve in connection with the feed cock is technically called the "non-return" valve, because it prevents the return of the water from the boiler. This valve is highly essential in case of the cock being open and the feed pipe bursting, when the pressure in the boiler would keep the valve shut, and so prevent the escape of hot water from the boiler. It only opens at each stroke of the feed pump, which may be the engine feed, donkey feed, or hand feed pump. It is better to have separate feed cocks and valves for the engine feed, and another for the donkey engine and hand pump.

Blow-off Cocks. The blow-off cock is connected with the bottom of the boiler—cast-iron elbow pieces and pipes between the bottom of the boiler and the cock ought not to be used,—and is used for blowing down the boiler and to let a certain portion of the water escape by the pressure of the steam into the sea, so as to keep it from getting too salt, etc. It is also used before the fires are lighted for filling, or partially filling, the boiler, as the water, when the cock is opened, will rise in the boiler to the same level as the water is outside the ship; if the water does not rise in the boiler sufficiently high, the hand pump must be used. There ought to be one cock on or close to the boiler and one on the ship's side or bottom, about the turn of the bilge; or a Kingston valve in lieu of the latter, as if one gets out of order so that it cannot be shut, the other may be shut and so keep the water in the boilers, and thereby prevent the necessity of drawing the fires, as drawing the fires might be the means of losing the vessel, for without fires the engines cannot be worked. It is also highly necessary that the outer blow-off should be bolted directly on to the plating of the ship, and not on to cast boxes or branches; as doubtless if some of our lost steamers could speak to us, they would tell a tale that would clearly show the necessity of all cocks being bolted directly on the plating of the vessel. Cast-iron stand pipes are not to be relied on.

Watergauge Cocks. These cocks, are small cocks placed in front of the boiler, by opening which the height of the water in the boiler is ascertained. They are generally placed a few inches

above each other. When the glass waterguage is all right, it shows exactly the height of the water in the boiler; it may get choked or broken, therefore it is advisable to have three of these cocks in every boiler.

Glass Waterguage. The glass waterguage is a most useful appendage of a boiler, and consists of a glass tube attached to the boiler by means of brass fittings, with cocks on the fittings, one on the top part and one on the bottom part. These cocks are so as to open and shut the communication between the glass tube waterguage and the boiler. When both cocks are open the water rises in the glass to the same level as it is in the boiler, as the pressure from the steam on the water in the glass is the same on the bottom as on the top; but if the top cock is shut the water will rise to the top of the glass from the pressure acting on the one end only. There is a third cock on the bottom of the fittings, communicating with the tube; when this third or bottom cock is open, and also the top one, and the bottom one that communicates with the boiler is shut, the water will be blown out of the glass. When the top and bottom cocks are open and the openings to the boiler not choked, and the third or bottom cock shut, by a glance at the glass waterguage the person in charge of the boiler can see the height of the water in the boiler. It is very important to keep the water at its proper height, as if it is allowed to get too high it will pass into the cylinder, and may thereby cause the engine to break down, and if the water gets too low, the plates, etc., may be injured from becoming overheated, and an explosion may take place.

Steam Guage. The steam guage is intended to show the pressure of the steam in the boiler. It is of various construction, the simplest, particularly for low pressure, is the mercurial guage, which consists of a bent tube like a syphon inverted, having a bore of equal area throughout; one end is attached to the boiler, the other opens to the atmosphere with an index marked like a rule attached to it. Mercury being put into the tube it rises to the same level in each leg of the syphon, and when the pressure of the steam acts on the surface of the mercury, it forces the mercury down one leg and raises it a corresponding distance in the other leg, carrying with it a small stick which floats on the mercury and denotes on the index attached the pressure to which the steam has risen in the boiler above that of the atmosphere. The mercurial guage can be easily made and easily kept in order.

Brine or Scum Cocks.—The brine or scum cock is attached to the boiler and is for allowing a certain portion of the water to be blown away and along with it as much salt, etc., as is contained in the

water that is blown away. The quantity of water thus blown away and the quantity evaporated is replaced by the feed pumps. If brine cocks are not used the blow off cocks must be used oftener, so as to keep the water from getting too salt. The water in the boiler should never exceed twice the saltness of ordinary sea water, or rather under that density. It is well to keep the brine cocks open whenever the engines are working, and only use the blow-off cocks as often as circumstances require; by doing so it will prevent the frequent and sudden alteration in the level of the water.

SIR JOHN FREDERICK WILLIAM HERSCHEL, BART.

We have to chronicle the death of this distinguished man of science on Thursday, the 11th of May, and the interment of his remains in Westminster Abbey near to the tomb of Sir Isaac Newton. Little we can say will add to the lustre of Sir John Herschel's fame; he has lived to benefit mankind, and the legacy he leaves to posterity bears glorious witness to the noble work of his life. The results of his unceasing labours are of value to us all. If we may apply Milton's lines more practically than the poet intended, it might be fairly said that Herschel had

> "Into the heaven of heavens presumed
> And drawn empyrean air."

With an ardent spirit he has searched into the measureless depths of the firmament to learn something of the grand laws which rule the Universe, and whatever has been revealed to him in his researches he has communicated to his fellow-man for his instruction and comfort. And not the least to benefit from such scientific labours is the navigator, to whom the sun, moon, and stars are friendly guides, and to whom any additional knowledge concerning the heavenly host is of inestimable value. The particular results of his investigations are far too numerous and too well known by our readers to be here recorded, they are somewhat similar to those silent and continuous observations which are nightly made at the numerous observatories, by means of which the positions or movements of the heavenly bodies are determined. But the general results of Herschel's labour are more evident. By the vigorous expression of his opinions he gave an impetus to scientific in-

vestigation which at an early stage of his labours he believed to be declining, and ever since his aim seems to have been to disseminate scientific knowledge, to open the eyes of the people to its manifold beauties, and to enlarge the boundaries of thought by means of this new knowledge. His mode of conveying information on the weighty subjects he had to deal with was eminently attractive. His heart, being always in his work, spoke in his writings, and appealed to the reader with a power very different from that exercised by the cold, dry books of science which do not discover one human sentiment to warm the reader into sympathy. Around the matters of fact he had to talk of, he wove a brilliant tissue of the beauties of nature as related to the facts, which caught the fancy and impressed the truths on the memory.

Sir John Herschel belonged to an astronomical family. His distinguished father was the discoverer of the primary planet *Uranus*, and contributed very largely to the general stock of astronomical knowledge. Sir John's aunt, Miss Caroline Herschel, was also a most devoted student of astronomy, and was the constant assistant of her brother in their observatory. There was also another brother who joined in their labours. Among the influences of such a household it is not surprising that young John should have grown up with an astronomical bias. The silent watches of the night must certainly have impressed him, and the quietness of the house by day when the watchers slept, probably helped to induce the state of mind necessary for that patient and continuous observation which was so remarkably developed in after years.

We read of occasional visitors going to the observatory to read small print at midnight, "by the light from the small star in the foot of the goat," or to see the means employed for making observations, but the marvellous sights seen by the patient investigator of the starry vault of heaven were not allowed to be seen by visitors, it was the reward of long years of devotion to the study, a solemn privilege not to be granted for the exercise of mere idle curiosity. These things, in conjunction with the strong affection and veneration which the youth had for his father, all tended to fit him for the great work which he has so well performed.

It is not without regret that we leave our contemplation of this great and good man. But though we mourn his loss, yet with our sorrow we must mingle thankfulness that such a man has lived amongst us.

MERCHANT SHIPPING LEGISLATION.—V.

CRIMPING.

CRIMP. *n.* 1. A game at cards.—*B. Jonson.*

2. One who decoys others into military service (a low word).—*Dr. Johnson.*

3. An agent for coal merchants and for persons concerned in shipping.—*Buchanan.*—*Worcester's English Dictionary.*

"THE real question is, whether in the case of seamen, the Government itself should be chief crimp."

"If the Government is to be chief crimp, I take it that it must be for reasons altogether apart from moral and philanthropic considerations. I take it that the Government steps in only because the State is interested from considerations partly pecuniary and partly military. If it were not so, it is difficult to understand why the State should interfere as to the nature of the agreement to be entered into between employer and employed."—*Discussion as to Crimping.*

IT sometimes happens that the desires of the benevolent and the aims of the statesman are at one.

An instance of this is to be found, in the wish of both to reduce crimping. The benevolent wish to abolish crimping, because it tends to immorality, and to the jeopardizing of the seaman's future state. The statesman wishes to abolish it, because by its immorality it leads to waste of men and money.

Agents for coal merchants are no longer specially known as crimps. Nor are agents for military or recruiting service. There is no doubt that the Government at one time fostered crimps, and used them largely in procuring men for service in the Royal navy, but whatever may have been the connection between the crimp and the Admiralty in bygone days, that connection appears to have been severed: certainly for the present, and let us hope for ever. The connection existed concurrently with pressgangs and with an absence of method or principle in engaging or rather obtaining or appropriating the services of British subjects.

"Crimping," now, so far as the use of the term remains, is applied exclusively to dealings more or less surreptitious, and more or less illegal and immoral, of infinite blackguards who infest such of our ports, towns, and cities as are visited by sea-going ships.

The moral condition and social wants of the merchant seaman, or, more strictly speaking, his immoral condition and his carnal appetites,

are usually, unfortunately for him, treated, written of, and talked about as if they could be cured and satisfied by religious instruction. Plenty is said and written in that direction, and plenty of organizations are afoot for assisting him to obtain a state of blessedness hereafter. Enough has already been done in this way to hold out a fair expectation of the fulfilment of Tom Dibdin's hope with regard to *all* our sailors—

> "Yet shall poor Tom find pleasant weather
> When He who all commands
> Shall give to call life's crew together,
> The word to pipe all hands.
> And Death who kings and tars dispatches,
> In vain Tom's life has doffed;
> For though his body's under hatches,
> His soul will sail aloft."

We do not therefore in the present article, intend to treat the subject on sentimental and so-called religious grounds. We shall not indulge the reader with any statement (unless purely inadvertently) of the seductions and miseries ever attendant on the footsteps of the merchant seaman ashore, nor shall we attempt to depict the sailor's life when among those who prey on his condition and habits. We shall rather regard these so-called moral back-slidings as plain facts, to be dealt with resolutely and effectually, and as incidents to a great extent inseparable from the seaman's circumstances.

Discussions as to the spiritual condition and wants of the seaman we must leave in other and more powerful, although not in more willing or anxious hands. Those of our benevolent friends who fortunately have plenty of charity, and plenty of leisure, and whose opportunities for looking to these higher things are only equalled by their means, need no assistance from our pen. Those of our friends whose activity takes a benevolent turn may, let us hope, long continue to labour in the field they have selected, and that their labours may be rewarded is our earnest prayer. Missions, homes, tracts, Little Bethels, midnight meetings, all such earnest and well meant efforts to strengthen the sailor with spiritual food, we must leave to them.

We have now to concern ourselves only with economical considerations and dry facts, a due understanding of which is probably the most effectual step towards improving the social condition of the merchant seaman.

For after all, the consideration most likely to lead to the discomfiture of the host of devils who demoralize, debauch, and disease the seaman, physically and morally, is (what happens to be by far

the strongest of the strong arms of the flesh) political and commercial necessity. It is well that it is so, otherwise the evils could never be overcome.

Before proceeding to the direct consideration of this wretched subject, we would offer a few hints to those who labour so energetically to obtain funds for promoting the sailor's spiritual welfare. Our strong conviction is, that a little money judiciously spent in active hostilities against crimps would be of immense benefit to the good cause for which they are working. If the Jew slop-sellers, keepers of brothels, and others who prey on seamen were to be convinced by a few more convictions that their proceedings are dangerous to themselves and likely to lead to unpleasant consequences, they would be checked. Money is always forthcoming for Seamen's Missions, for the Seaman's moral improvement, and for Model Homes, and this is well; but it might, probably, be as well also if a few pounds were found and some organization were established to give the crimp an occasional taste of the law. As it is, he goes scot free, and fattens and plies his trade without hindrance, while all sorts of good people are attempting to build up the seaman to withstand his devices, and so resist the carnal and awfully real temptations spread out before him. The seaman's friends rely too much on the spiritual arm. Half-a-dozen convictions would do more good than a year's preaching. The sailor never can single-handed beat or withstand the devices of the crimp. The combat is unequal. On the one hand is organization and profligacy in meretricious attire; on the other, is the seaman with his appetites and passions craving and uncontrolled. As well as attempting to build him up in rectitude and virtue, good might therefore be done by an occasional knock down blow to a crimp who is guilty (as many are daily) of some flagrant breach of the law. The crimp goes unpunished for the reason pointed out above, that nearly all the energies of the "Seaman's friends" are turned in one direction, viz., the spiritual and the inner vessel. Preach to the seaman, pray with him, catechise him, exercise him, build him up in faith by the most approved method, but at the same time assist him with the arm of the flesh to wage war with his carnal enemy, for we may be assured that except in the case of a seaman who is what his friends would denominate a saved vessel, the crimp will draw out of him in half-an-hour all the good that has been carefully poured into him in a whole year. We are not sneering at moral and religious teaching, we believe it to be the one thing needful. Still we want to point out that from political reasons crimping must be checked, and that carnal weapons must be used.

It is useless to attempt to make a little company of saints out of merchant seamen so long as a great and organised company of devils are allowed to spread their temptations before them in the light of day, and run rampant in our ports. For the trifling consideration of a few pounds sterling, judiciously applied in aiding the seaman to enforce the law against the crimp, the latter would be driven into the back ground; the seaman who desires to be morally good would then have a less unequal combat to wage, and he who is wavering would have less temptation thrown in his way. The seaman is not in the power of the crimp through any thraldom likely to be successfully met by religious teaching alone. He is under the crimp from the necessities of his case, not the least of which is that the crimp is allowed to be always at hand to pander to the seaman's appetites, and that the seaman has no means of fighting with this terrible foe.

With an allusion to the remark attributed to a deceased statesman, that "whilst it is undoubtedly right to appoint fast days and prayers when a visitation of cholera is apprehended, it is also wise to take steps for providing efficient drainage and to establish sound sanitary regulations," we dismiss the religious aspect of the question, and take up the subject as one affecting Mercantile Marine Legislation.

If we desire to engage a gardener or a cook, or if an employer of labour desires to engage work people,—navvies, labourers, masons, carpenters, tailors, millhands, etc., etc.,—he can do so without being compelled to go to an office established by the Government, and there enter into an agreement in a specific form before an official; and the ordinary reader at once asks why it is that a shipowner, as an employer of labour, is placed in a different position.

At first sight it is not easy to answer the question, Why it is that a seaman and his employers should be more hampered in this respect than a tinker and his employer, and were it not for special reasons, to some of which we shall presently allude, this question would probably be unanswerable. As it is there are many who believe that even after considering special reasons and circumstances it would be wise to leave the engagement of a seaman as unrestricted and as open as the engagement of any other workman or labourer.

But the chief reason why this cannot be, is that a seaman who is engaged in this country may be engaged to go all over the world on all sorts of expeditions, and that his services may terminate anywhere by wreck, fire, death, desertion, discharge, capture, etc., etc., and that provision must be made for providing for him in such a case, and sending him home if he is distressed, or for accounting

for his disappearance or death if he deserts or dies, and for his wages and effects.

The expense of providing for distressed seamen, finding hospitals for them, and sending them home, is a heavy item in the national expenditure. The nation has to pay or to enforce payment, and the nation therefore has to take precautions to protect itself and to provide for economy in expenditure. Other reasons are, that special precautions and regulations are necessary for preventing or punishing crimes committed at sea or abroad whilst master or seamen are out of reach of all tribunals, for the personal protection of subjects taken away in ships, and for the masters in charge of them, and for securing information as to the employment and whereabouts of seamen who may be required for the defence of their country. The main point is, perhaps, the first. However this may be, it is found that in order to afford security, various regulations concerning the engagement and discharge of seamen, justifiable on no particular ground, but fully justifiable as necessary to all these points, have to be observed, and if necessary enforced by law.

The expenditure out of the pocket of the British taxpayer in relieving and sending home distressed seamen is as follows:—

		Vote.	Expenditure.		
		£	£	s.	d.
Net expenditure for	1855-56	17,000	8,662	5	1
,, ,,	1856-57	17,000	16,695	18	9
,, ,,	1857-58	20,000	21,739	3	2
,, ,,	1858-59	20,000	17,503	9	8
,, ,,	1859-60	20,000	21,094	15	1
,, ,,	1860-61	20,000	19,144	18	7
,, ,,	1861-62	20,400	22,492	7	1
,, ,,	1862-63	20,400	25,876	6	4
,, ,,	1863-64	20,400	19,218	14	2
,, ,,	1864-65	34,400	35,788	16	8
,, ,,	1865-66	30,400	28,259	10	5
,, Half year	1866-67	..	20,337	16	2

Now when the taxpayer at home has to find this money, it is but fair that he should have means for keeping the outlay within reasonable limits, and for seeing that it is not improperly spent. He would be utterly powerless in this respect were it not for the laws respecting agreements and service in British ships. When we consider how this expenditure may be increased by desertions and disease, and what an important part the crimp plays in increasing both, and when we consider further how disease and desertion by weakening crews lead to marine disaster and loss of life, we can

fully believe how desirable it is that we should understand what crimping is, how it affects the expenditure and interests of the country, what are its ramifications and phases, and how it can best be grappled with. If we fail to comprehend all this we shall be unable to grapple with the evil. To annihilate it is hopeless, to reduce it is all we can effect.

In the case of a British foreign going ship about to proceed on a long voyage, the owners engage the master and an officer or two, and the master engages the rest of the crew. The crew must be engaged at a Mercantile Marine office. A notice is put up at the office that the crew of the "*Blank*" will be engaged on a certain day at a certain hour. The master or some one on behalf of him or of the owners attends, and any seaman who feels inclined for the service and ship and agrees to the terms, offers himself for employment.

There are special penalties attached to persons engaging or hiring seamen otherwise than according to law. In the getting together of the crew, however, although the actual engagement is hemmed in by statutory provisions the crimp often plays an important part.

Any one attending at a Mercantile Marine office will not fail to discover many a drowsy, seedy, debauched looking seaman attending to obtain employment; and a little previous observation out of doors would have led to the discovery that the seedy-looking debauched man was accompanied on his way to the office by a female with bare arms, and a shawl for a bonnet, or by a man half sailor half pugilist, and wholly bully—or by both—and that one or both are waiting to ascertain the result of his application for employment. This seedy bebauched object calling himself a British seaman came home perhaps five or six days ago from a long voyage—he had then a large amount due to him, perhaps ninety or a hundred pounds. He had besides every desire, and by the means of the crimp (who was aided in his designs by the bad state of the law as to payment of wages which we shall refer to further on) every facility to satisfy his pent-up appetite. On his arrival he was met by his tempter and psuedo friend, and by the end of the fourth or fifth day the whole money had gone. The man is now debilitated, diseased from the effects of methylated spirits administered under the name of gin or whiskey, etc., by opium, or cocculus indicus in the name of beer, and in addition, by some loathsome complaint that may and probably will incapacitate him after a day or two at sea.

Thus it is that he who has had no opportunities of getting wholesome food and rest, so necessary after a long voyage, must begin

salt provisions again, with a frame shattered, a digestion deranged, and a body having in it the germs of a disease that shall at some future day have a hand to hand tussle in his body with another disease, viz., scurvy. Besides spending his eighty or ninety pounds, our debauched seaman has parted with his clothes, and he now applies for employment having in this world (in addition to his debilitated frame and the seeds of disease to which we have referred) half a suit of clothes. The crimp, however, has not done with him yet. Before the man goes to sea he can obtain an advance of wages by an 'advance 'note—this is the last bit of him that the crimp is now waiting for. The seaman gets his advance note and goes away from the shipping office, and the crimp sticks to him like a leech. The crimp will, so he says, lay the advance note out to the best advantage for the seaman, or will cash it for him, or will kindly take it in part payment of the score which somehow or other has exceeded the eighty or ninety pounds in six days. The crimp gets the note, the seaman gets for it perhaps some of his own clothes back, or a few shillings' worth of slops, or perhaps nothing in the way of clothes, but he has one more drink in which crimp and woman join. Now a seaman's advance note is not of any value unless the seaman goes away in the ship. The crimp has now for his own security therefore to do what he can to see that the seaman does go to sea. So long as the crimp has the seaman in his clutches there is no chance of his disappearing, and a drunken and powerless man is more easy to control than a free man. Therefore the crimp keeps the seaman drunk so that he shall not run away, and when the ship is about to sail puts him on board, and there so far as the crimp is concerned is, or may be, an end of him. It thus happens that in such a case the crimp is of service to the shipowner in helping to get the seaman on board. If the seaman does not desert before the time stated in the advance note, the crimp gets the advance note cashed—if he deserts before that the crimp loses his money.

(To be continued.)

NOTES ON NAVAL FLAGS.

1. Legendary and Suggestive.

Flags are not things of modern use. They are commemorated in the mythologies of Greece and Rome, in weird Norse fables, in old chronicles, in pictures, on tombs, and in the Bayeux tapestry. They are highly suggestive things, things that lived very much in their

present form centuries before maritime skill and naval enterprise gave into England's resolute keeping, the key to the narrow seas. Our modern flags have had ancestors that waved over the Nile pleasure boats on gala-days hundreds of years ago; that hung dejected and disgraced to the water's edge from the ships of ruined Carthage in the splendid Roman triumph; that adorned, some historians suppose, even the galleys of Sesostris; that witnessed possibly the decay of the Egyptian power, and likewise the overthrow of the great ports of Tyre and Athens; that watched the light of navigation dawn again after the fall of Rome, under the hardy Venetians and Genoese, till the spirit of enterprise spread to the Sicilians, Spanish, Portuguese, French, and at length licked the coast of Holland, and the chalk bound shores of England.

Long before the famous war-ships of the fifteenth and sixteenth centuries were being raised in the dockyards of Erith and Woolwich, long before the famous naval commanders of the Tudor period hoisted the red cross of St. George in defence of their country, whilst Britons, not slaves but savages, paddled the water in their hollowed trunks, the polite and intellectual peoples of Greece and Rome had their flag-ships on the sea.

These ships carrying the chief officer or admiral were distinguished by flags, from which the vessel itself took its name, and the signal for the commencement of a battle was displayed from the mast head, either in the form of a shield painted with a device, or in a red flag indicative then as now of anger or defiance. Nor is the term admiral one of modern adoption, save in its present restriction to a naval commander; in former times the office not being confined merely to maritime authority, but conferred also on military officers and governors. The word is of Arabian and Greek extraction, it being derived from the Arabic *emir* or *amir*, implying *lord*, and the Greek adjective *halos*, *of the sea*. Amongst the Saracens, eminent soldiers were so styled, and Mahomet constituted several governors who were called admirals, to four of whom with his dying breath he bequeathed the nowise easy task of subduing all those who of Arabic extraction professed the Christian religion! Under the Greek emperors an admiral was the "Magnus Drungarius Classis," and the ensign of his authority was a truncheon of purple colour richly gilded.

To return to those ancient boats and galleys which were among the first to hoist flags upon the water, whether for the purpose of battle, or piracy, or pleasure, we are struck by the curious similarity between the colours of the stuffs of the Egyptian pleasure boats, described as floating from the shafts of the rudders or the lotus

stalk crowning their extremities, and those woven into the threads of our own "red, white, and blue;" for omit the white and you have the very hues, red and blue, that decked, perhaps, the galley of the dissolute Antony and his ill-fated beautiful love, Cleopatra.

Compare too the painting of an Egyptian boat, its gorgeous sides of yellow, red, green, and black, with a sheet of naval signals, and the resemblance is curious. In the one case it is the sense of beauty as developed in the south, that conception of brilliant colour, such as animated the masterpieces of the rich Venetian school, but vulgarly exhibits itself in the painted face and beads and feathers of a Maori, or in the gay dress of an African damsel; now, in the other, it is the sense of utility,—simply the blending of colours with one another,—for the choice of dark colours, or those approaching to one another, would not suit a dull and variable sky, neither could the eye trace them far across the water, or through the smoke and confusion of a sea fight. Hence the fact that the contrast of colour cannot be too strong in signal flags, of which we shall speak hereafter. Red and blue and white belong to our national flag, and to the flags of other nations, because these colours can be followed to a greater distance than any other, and so, *par consequence*, our admirals of the white, red, and blue. Yellow, green, and black, were colours used by the Egyptians in staining their stuffs and decorating the prows and sides of their vessels, but of these none save the yellow is permitted to hold rank as a signal in our present code, and this is dubiously received, it being too apt to resemble a dirty white when seen from a distance.

Through how many pages of our "Island's Story" can we trace the red and white! (the blue, type of the north of Britain, not being added till the union with Scotland in 1707). These were the Plantagenet colours, the plain red cross of England, "St. George," having been first adopted by Richard I., from whose galleys the same flag, and another bearing the lion or Plantagenet leopard floated. Most of the succeeding princes of his house quartered lilies with their leopards carrying them into the heart of France across the narrow channel,

> "With banner and with music, with soldier and with priest."

For many of the earlier war ships had forecastles for minstrels, and the sweet strains of trumpets and hautboys doubtless made "goodly melody" beneath the pennon of St. George, hoisted above sails the beauty of which in design and embroidery, together with that of the quaint and costly flags hung from the prow, is chronicled in the

ancient style of Froissart. And amongst the reds and whites of different periods, the fatal roses of Lancaster and York rise to the memory, roses that sent

"A thousand souls to death and endless night;"

albeit the stained emblematic banners of a feud which dyed in one universal woe, and gloomed in one horrible shadow the greater part of England, find no place in the naval records of our country.

Many of the devices adopted and borne by the early peoples of Europe have been described with a minuteness and a carefulness in their ballad histories, and have descended in poem and picture to our own times from an era so remote, that they may fairly be entitled to rank with the legends of their several countries, and to bear the title of legendary flags. In passing to a brief notice of one or two of them, we are led to observe how strangely suggestive they are of the characteristics of their nations; think of the chief standard of the sea-loving Egyptians, the monstrous Sphinx head which they carried bound to their masts, or jutting from the prows of their vessels, and recall with it the force of a people that could without the aid of modern science raise such gigantic structures as the pyramids, and temples, and obelisks, dumb records of former greatness, still standing in a country which has had its "rise, progress, and decay." A different picture is given us in their "crane," another favourite emblem which carries us to the edge of the sacred Nile, and we see the white-plumed dreary-eyed pelican standing on the dusty sandbank of the ancient river beneath its brilliant native sky.

The Romans cherished their standards with a touching veneration, a flag was to them the symbol of life and death, honour and dishonour. In preparations for war whether by sea or land, these indispensable insignia of a battle were brought forth from their repose in the capitol or treasury, and distributed to the seamen and soldiery, the standard in chief being of course the celebrated eagle carved in silver—some say gold—and mounted on a pole, holding in its claw a thunderbolt, expressive of the Roman power. If we put any faith in old chronicles, Cæsar would have landed with difficulty on the Kentish coast, but for the bravery of the standard bearer of the tenth legion. The glimpse of British barbarism as opposed to the Roman civilization of the time is not without its interest. The old Latin story shews us the pebbly, pearly strand, thronged with eager-faced painted savages, the many war-chariots with the murderous scythes fixed to the axletrees of the wheels, the mud hovels dotted here and there over the green landscape; and

before us the shining sea studded with the huge Roman vessels, charged with their legions, whose glittering shields and helmets flash the blinding sunlight back to the wondering British eyes. The story itself is very commonly known, how the general's bulky ships could not near the land, how the soldiery were ordered to wade to shore, how the Britons with wild whoop and war cry dashed into the water to follow up their unlooked for advantage, how Cæsar to animate his startled and terrified legions, commanded the ships carrying the slings and other war-like instruments to advance, and the natives, dismayed at the sight thereof, fell back; how the standard-bearer of the tenth, in face of his faltering comrades, plunged into the waves, "making earnest supplication to the gods," holding aloft the silver eagle, bidding them, in phrase burning and simple, to follow, if they would save their standard from disgrace.

So runs the tale; it has a touch of vigour and romance in it; the silversmith's craft assumes a momentary reality, and the bird is, for the time being, the moving living light of the republic, which leads them on as did the pillar of fire the Israelites of old in the desert.

The Danes in their invasions of England adopted devices for their ships, wherein we find a pictorial impersonation of the wild untameable spirit of the early Scandinavian race. And, bound up with their legends of dying heroes putting forth to sea in burning war-ships, chaunting hymns to Odin, and going down amid the flames to the "undiscovered country," in which they hoped to quaff the life-blood of their enemies—with poems, such as the story of Baldwin the Beautiful, stricken to death with a branch of mistletoe and so forth,—comes the account of the fabulous Danish standard. This famous flag, according to tradition, was worked by the three fair daughters of Lothbrock; it represented a black raven, woven on a blood-red ground, and was called "Reason." The historian Asser affirms that it was begun and completed in one afternoon. If victory awaited the army, superstition declared, it would appear like a live raven, flying and fluttering its wings,—an encouraging sign from Odin—but if the wings drooped they argued the displeasure of the gods and subsequent defeat. With the Goths and Danes the dragon was held an emblem of war, and hence possibly the strange Scandinavian Drakars of the ninth century, ships whose prows bore at the end a terrible dragon, his claws spreading out and lying on the surface of the water, his wings forming the sides of the vessel.

The form of flags, pennons, and standards, has altered little from the time of our earliest traces of their adoption to the

present date. The pretty "banner screen" used in modern decoration is the ancient *vexillum* of the Romans; the pennons and flags floating from the mast-heads of our ships differ apparently in device only, being similar in form and colour to those carried by the ships of Rome and Carthage so far back as the Punic wars. The naval insignia of our day are probably not very different from those of olden times, the "coloured tongue of rag" signals as much now as it did formerly, and the gay colours that decorate our enormous fleet tell us that we are now enjoying that naval glory which in turn has added to the renown of many great nations. The flags which float from our ships are emblems of our freedom, power, and commerce. In thinking of these things, we recall the words of the gifted, brilliant, but ill-fated Raleigh, "Whosoever commands the sea, commands the trade of the world; whosoever commands the trade, commands the riches of the world, and consequently the world itself." And the reflection is more than ever borne upon us, how important and responsible is our position among the nations.

MAJOR-GENERAL SIR EDWARD SABINE, K.C.B.,

President of the Royal Society.

As we remarked in our last number, the scientific labours of Sir Edward Sabine in the cause of magnetism have been peculiarly connected with maritime objects; a sketch, therefore, of his life in the *Nautical Magazine* is not inappropriate, considering the great services he has rendered to navigation.

Sir Edward, the son of the late Joseph Sabine, Esq., of Tewin House, Herts., was born in 1788, and is consequently now in his eighty-fourth year. In 1803 he obtained his commission in the Royal Artillery, and was at Gibraltar from 1804 to 1806, when he returned to England to join the Horse Artillery. In 1813 he went to Canada where he may be said to have first distinguished himself, as he was favourably mentioned in the despatches of the commanding General for his services on the frontier. Sir Edward's connection with the naval service may be dated from the year 1818, when in the capacity of astronomer he accompanied Commander John Ross in his expedition to discover the north-west passage, and Captain Parry, with the same object, in 1819.

From 1821 to 1823 Captain Sabine was employed in conducting a series of observations with the pendulum, vibrating seconds in different latitudes, for the purpose of determining the figure of the earth; in the course of these labours he underwent the most trying changes of climate from Africa to Spitzbergen and Greenland. The results of these observations were published by order of the Government.

In 1825 he was associated with the great philosopher we have just lost, Sir John Herschel, in conjunction with two French savants, in ascertaining the differences of meridian between Paris and Greenwich, by means of rockets, and in 1827 and 1828 in pendulum observations at Paris and Altona; in the last named year he received the honourable appointment of one of the secretaries of the Royal Society.

From 1830 to 1837 Captain Sabine served with the army, and since that time has been almost continually engaged in physical observations and researches relating principally to the earth's magnetism; he has filled successively the positions of Foreign Secretary, Vice-President, and Treasurer of the Society of which he became in 1861 the President. Sir Edward was one of the early members of the British Association for the Advancement of Science, subsequently filled the office of General Secretary, and in the year 1852, at the Belfast meeting, was President.

In 1838 Sir Edward directed the attention of the Physical Science section of the British Association to the increasing importance of terrestrial magnetism, and through his means a committee was formed to urge the Government to fit out an expedition for researches in that branch of science; this led to the well-known Antarctic expedition of Sir James Clark Ross, and the establishment of its offshoot magnetic observatories of St. Helena, Cape of Good Hope, and Tasmania. In 1840 he was appointed to superintend the Colonial Magnetic Observations. The observations recorded by all these expeditions have been arranged and discussed by Sir Edward, and it was only in the year before last that his labours connected with them were brought to a termination. To the great importance of these researches the whole world of science bears witness, and the remarkable discoveries of the laws relating to magnetic storms and the influence of the sun and moon upon the magnetic force on the earth, at once stamp Sir Edward as one of the first magnetometricians of the day. Sir Edward was promoted to the rank of colonel in 1851, and lieutenant-general in 1865.

Of Sir Edward Sabine's labours as President of the Royal Society, only those associated with him can know either their extent, or the

assiduity with which he attended to them, but his suavity of manners and general urbanity extended beyond the sphere of the Royal Society. In resigning the onerous, and we may well add, arduous duties of his exalted position, Sir Edward will leave a name and a remembrance which will last long, and we cordially hope he will be spared many years to give his valuable counsel in the Society of which he is about to resign the Presidency.

Sir Edward is a member of several European and American learned and scientific societies, and is one of the recipients of the Prussian Order of Merit in Science and Literature. In 1821, he received the Copley Medal of the Royal Society, and in 1849, the Royal Medal, he also received the Lalande Medal of the French Institute in 1826; he has also been created a Knight Companion of the Bath.

We understand that the Astronomer Royal, Mr. J. B. Airy, has been invited to offer himself for election as President.

YACHTING AND ROWING.

It appears to be widely doubted whether we have not issued somewhat ingloriously from the *Alabama* and kindred difficulties, thanks to the Commission sent out to America, possibly with instructions to "make things pleasant all round;" but, however that may be, it is quite clear that, in the matter of international yachting we have gained a moral victory over our Yankee cousins. Mr. Ashbury's pertinacity in the cause he has so much at heart has met with its reward. He claimed to race for the cup won by the *America* against a champion vessel selected by the custodians of the prize, the New York Yacht Club, and Mr. G. L Schuyler, the sole survivor of the shareholders of the *America*, has written a letter to the *Spirit of the Times* clearly upholding Mr. Ashbury's views of the conditions under which the cup was entrusted to the club. Nevertheless the American press appear to be unanimously of opinion that Mr. Schuyler does not know what he is writing about, and strenuously contend that, unless the owner of the *Livonia* be prepared to sail against the entire fleet of Yankee yachts, he has no right to open negociations for fighting the Pacific sea-fight of twenty years ago over again. The ultimate influence of Mr. Schuyler's communication on promoting the match which Mr. Ashbury seeks,

is, of course, beyond our ken. Sooner or later the N. Y. Y. C. will be forced by public opinion on both sides of the Atlantic to make a concession substantially consonant with Mr. Ashbury's views, and when that shall have been formally done and agreed to by "the high contracting parties," it will be time enough for us to enter into a discussion of the probabilities of an international match. Meanwhile yacht-building is going on in America at a singularly unprecedented rate. The owner of the *Livonia* may rely upon plenty of "foemen worthy of his *keel*" before the expiration of the season.

Amongst the American yachts expected to arrive here very shortly are the *Dreadnought*, the *Wanderer*, and the *Enchantress*. As in this country public interest has for some time centred in the *Livonia*, so, across the Atlantic, has rumour long busied herself with the name of a new American yacht, aided by which the owner, Captain Samuels, means "to lick creation." Whatever a "Devoted Yachtsman," "Tom Cringle," and the other leading American authorities on yachting in that country may have to say against our models, it is obvious that the astute navigator of the *Dauntless* in the memorable ocean match, had those same models in his mind's eye when he gave the order for the *Dreadnought*. A weekly journal shrewdly anticipating the interest which is certain to be engendered by the appearance of the *Dreadnought* in English waters, has been at the pains to compare her with the *Livonia* and other English yachts. We learn that she has almost as much dead rise as the *Cambria*, and is much fuller forward than American yachts usually are. She is not so long by four feet as the *Livonia* on the load-line, and has one foot more beam. Her floor has very little hollow and it is conceivable that her displacement is small, since it is stated in the American papers that she will only carry sixty tons of ballast. She has a fore-stay sail and jib after the fashion of our own yachts. The *Dreadnought* has an area on the load-line of 2,522 feet and the *Livonia* one of 2,511 feet. The areas of the lower sails of the two vessels are in the *Dreadnought* these: main sail 3,402, foresail 1,624, fore staysail 1,150, and jib 663—total 6,839. In the *Livonia*:—main sail 3,458, foresail 1,570, fore staysail 984, and jib 1,107—total 7,119.

According to this calculation there is very little difference between the two vessels in respect of sail-power, that difference being in favour of the *Livonia* by 280 feet; but if 833 feet for the *Dreadnought's* flying jib be added, the excess becomes considerably greater on the other side. She has a shorter main gaff than the *Livonia*, but otherwise her spars are pretty much the same length

as those of Mr. Ashbury's vessel. Her quarters are light and her entrance full, and she has a very long counter.

The publication of two papers read at the last session of the Institution of naval architects "on the measurement of yachts and time allowances in competitive sailing," will not we fancy aid much in the settlement of the most vexed of all yachting questions, albeit the essays themselves were exhaustive enough to satisfy the most hair-splitting contributor to the *Spirit of the Times*. Mr. H. Liggins' contribution to the literature of the subject, threw little or no additional light in the direction of a remedy for an evil, real or alleged, whereof so many yachtsmen complain; but Mr. C. H. Haswell, an American civil engineer, *did* make a suggestion. It may be said that Mr. Liggins described the bane, and Mr. Haswell submitted the antidote. The latter admits not of adequate "digestion." It is far too elaborate to be compressed within the few pages placed at our disposal for a comprehensive survey of the principal yachting events of the month, and yet we should be wanting in our duty were we to omit all mention of Mr. Haswell's panacea. It will be found somewhere in the following fragmentary excerpts from his carefully-written paper: "Stability in a vessel is the determining element of capacity to carry and maintain her power of progression. . . . The carrying of sails, under any or all systems of allowances of time, should be restricted in sloops to mainsail, jib and flying jib, and jib and gaff topsails; and in schooners to the same, with the addition of foresail and fore gaff topsail, and in both cases the topsails should have a fixed proportionate area to that of the lower sails over which they are set. To meet the error of this condition of unlimited sails, I submit that the area be computed in conjunction with the stability, and that they shall be restricted in a race to such as are set to the mast or masts and stays; that any allowance of time based upon tonnage, sails, area of flotation, or stability alone, is insufficient and imperfect, as they singly do not embody the elements necessary to arrive at a just estimate of the competing qualities of yachts; that the only just method of computing the relative capacities of yachts is by embodying with their statical capacity the area of sails they may carry, and thus combining capacity and power." So much for the preamble. Here is Mr. Haswell's "rule of measurement:" "Multiply the length by the beam cubed, and divide the product by the product of the depth of immersion from load line to under side of garboard strake, and the ratio of displacement of the hull (compared with the volume as determined by its length and breadth at the load line and the depth); all dimensions to be in feet and

decimals. Divide this quotient by 15,000, and the result will give the time in minutes and decimals for an amount under 100,000, and by 16,000, 17, 18, 19, 20, 21, and 22,000 for amounts respectively under 150,000, 275,000, 350,000, 550,000, 850,000, 1,350,000, and 2,200,000. To ascertain the difference of time, divide the quotient first obtained by the area of sails, and multiply the quotient thus obtained by the difference of time; divide the product by the quotient producing the least proportionate area of sails, and the result will give the difference of time in minutes and decimals." However sound may be the principles upon which Mr. Haswell's elaborately revolutionary scheme is based,—and we are not going to discuss them, for the simple reason that they deserve more careful attention at our hands than we are at present prepared to give—it must be obvious, even to Mr. Haswell himself, that his "rule of measurement" lacks the essential element of simplicity. If the present somewhat blunt rule must be superseded, it will be by one more comprehensible to the average yachting man, and easier of common every-day application than this of Mr. Haswell's.

The trial trip of the *Livonia* has been by far the most important occurrence of the month. Commodore Thellusson, that the owner of the new schooner might test her to the utmost, placed the *Guinevere* at his disposal, and accordingly this match—for such it practically amounted to—was sailed with that splendid vessel. She is twenty-eight tons larger than the *Livonia*, two feet less in breadth, and seven feet longer on the water line; she displaces about 290 tons of water as against the 206 displaced by the *Livonia*. The course sailed was the Queen's, round a mark off Yarmouth, returning past Ryde, round the Nab Light and back to Ryde. There was a light N.N.W. wind when the start was made to windward at about half-past eleven a.m. Each had whole lower sails and a jib-headed mainsail set. Mr. Kemp, who of all men we know is best able to judge of the schooner's capabilities says—"To sum up the results of the trial in a few words, we may say that the *Livonia* did not attain so high a rate of speed off the wind as every one expected she would; on the other hand, her weatherliness, quickness in stays, and general handiness surprised every one; and it was the opinion of the practical men who witnessed the trial that when her sails are properly stretched, she will gain so much when sailing by the wind, that her inferior speed, as shown on this particular trial off the wind, will be more than compensated for. We have no reason for thinking that her speed cannot be increased, on the contrary, we think it can."

The Prince of Wales Yacht Club commenced the season on

Monday the 15th. There were five entries, and after a rather drearily-prolonged match, the *Dudu* (15 tons), Mr. Holloway, won; the *Fairlie* (15 tons), Mr. Limbert, coming in second. The winning yacht accomplished the course from Erith round the Nore and back to Erith in 7h. 57m. 30s., and in the *Fairlie* 8h. 4m. Prize twenty-five guineas for first and ten for second. Time allowance, one minute per ton.

The *Wildfire*, once a cutter, then a schooner with a cutter's bowsprit, or, "double cutter," the first of our yachts to adopt the running bowsprit common to schooners, will re-appear as a racer this season, as soon as she shall have been furnished with a new deck and sails, and been newly coppered. The Scotch cutter *Garrion*, which, the leading Glasgow journal is confident, "promises to settle the vexed question whether a deep narrow hull or a broad shallow hull is the speedier"—rapidly approaches completion. The same journal continues,—"The accumulating difficulty of displacement with the depth of water has led the Americans to adopt shallow models; the *Garrion's* success will go far to disprove the correctness of the views they hold. In this sense the new cutter will be regarded with interest on both sides of the Atlantic as the latest and most consummate embodiment of English views." Will it? It is hard to imagine that the building of a little Clyde cutter can have that effect, notwithstanding the gravity and "circumstance" of the *Glasgow Herald's* assertion; but we shall see. News of this sort accumulates at a marvellous rate, and we must be pardoned for dealing with it somewhat cursorily. Was it mentioned last month, by the way, that Ratsey had received an order from Count Batthyany for a cutter of 112 tons, and for a yawl for M. Benoit Champy? The latter a clipper of 55 tons, similar to the *Alerte*, built in the same yard, and famous for her voyage to Australia. The *Rose of Devon*, 148 tons, belonging to Mr. E. Johnson, has been converted from a cutter to a yawl, by Harvey at Brightlingsea. The *Audax*, 62 tons, has likewise been converted into a yawl. Camper and Nicholson recently launched from their yard, at Gosport, a schooner of 166 tons for Mr. W. J. Rideout. She was named *Mavourneen*. All the yachting men are alive on the Mersey, and there is every prospect of the river making its mark in the matches thereabouts, which are already fixed. The commodore is not fitting out the *Irene* this season. Amongst the new yachts which will take their places in the Mersey fleet is one designed by Mr. Byrne for the owner of the *Avoset*. She is a composite yawl of 101 tons, was built by Bowdler and Chaffer, and has been named the *Sirex*. The *Volante* has been launched from Camper and Nicholson's patent

slip, where she had been hauled up for caulking. Amongst other items of yachting news, we learn that the *Niobe* cutter has been sold to Mr. W. Gordon, and fitted out for racing. Mr. Garthorne has purchased the 20-ton cutter launched by Hatcher last season, and named her the *Leanda*.

From America we have news of the launching of the *Rambler* at New London. Her length on water line is 103 feet 2 inches, beam 25 feet, depth of hold 9 feet, draught of water 10 feet. The area of her mainsail, foresail, fore staysail, jib and flying jib, which comprise her working sails is 7196 square feet. The weight of the vessel is 92 tons 212 pounds, weight of tanks and water 6 tons 1376 pounds, weight of ballast 74 tons 1362 pounds, of which 26 tons is lead. Total weight on displacement of vessel, 177 tons 710 pounds.

There has been nothing stirring worth a special note in the rowing world "since our last." A second or third rate man, named Kilsby, has been beaten by another of similar calibre named Spencer. We hear of a new rower on the Tyne, a young man named Bagnall, who is full of promise. The champion crew are in brisk training for the Anglo-Canadian Match. The other day they were run down by a steamer in the Tyne and two of them nearly drowned. It is announced that J. H. Sadler will go out instead of Kelley, and Percy as "extra man."

SOCIETIES.

MEETINGS, ETC.

ROYAL GEOGRAPHICAL SOCIETY.—The tenth Meeting of the present Session was held on Monday evening, the 24th of April, 1871, Major-General Sir Henry C. Rawlinson, K.C.B., Vice-President, in the Chair.

A letter was read from Mr. R. B. Shaw to Sir Roderick Murchison, on that portion of his recent journey to Yarkand (with Mr. Forsyth) in which, detached from the rest of the party, he explored the rugged country between the western extremity of the Thibetan Plateau and the Valley of Upper Shayok. He described the Plateau (17,000 feet high) as ending abruptly on the west of a great limestone range, which, like the masonry revêtement of an embankment, has protected the level table-land from the wearing influence of the rains from clouds sweeping up the Shayok valley. Standing on the edge of

the Plateau, the whole country westward appeared as an irregular mass of snowy peaks and narrow precipitous valleys. In attempting to descend one of the valleys towards the Karakoram road, the party suffered fearfully in struggling for three days through the broken ice of a torrent at the bottom of a stupendous chasm, from which, in some places, the light of day was nearly excluded.

A second communication was read on "The Journey of the Mirza across the Pamir Steppe to Yarkand and Kashgar," by Major Montgomerie. This was a detailed report of the journey of an Afghan gentleman, instructed by the officers of the Trigonometrical Survey, to traverse the Mahommedan countries across the Hindoo Koosh and Pamir Steppe, eastward to the plains of Eastern Turkestan. The journey was successful in its main object; and we had now, for the first time, a scientific account of those little-known regions with the means of fixing the geographical position of all the important places. The Mirza proceeded from Fyzabad eastward, along one of the head-waters of the Oxus, arising in Lake Pamir-Kul (13,300 feet), and thence to Tash Kurgan, Yanghissar and Kashgar. Crossing the elevated region of the Pamir, he suffered fearfully from the cold, although well clad, even to the lining of his boots, in warm woollen clothing.

Sir Henry Rawlinson explained to the meeting that the Mirza's route was the same as that followed by Marco Polo and Benedict Goez, and in latter times by Mahomed Amin. He also stated that the vexed problem of the longitude of Yarkand (placed by the Schlagintweits about 200 miles too far to the west) had been solved by the recent lunar observations of Mr. Shaw, the computation of which had been completed that day, at the request of the Geographical Society, by Mr. W. Ellis, of the Greenwich Observatory. These observations placed Yarkand in E. long. 77° 14′ 45″.

Colonel Walker, of the Great Trigonometrical Survey of India, and Sir A. Scott Waugh, also addressed the meeting, chiefly on the subject of the employment of native observers in the geographical exploration of the regions beyond the British boundaries.

THE eleventh Meeting of the present Session was held on Monday evening, the 8th of May, 1871, Major-General Sir Henry C. Rawlinson, K.C.B., Vice-President, in the Chair.

Despatches were read from Dr. Kirk, of Zanzibar, relative to Dr. Livingstone. The most important of these documents was a letter, dated November 15th, 1870, from Sherif Basheikh-bin-Ahmed, the Arab sent in charge of men and stores for Dr. Livingstone, and who had arrived at Ujiji, on the shores of Tanganyika. This letter

stated that, on the 10th of November, the writer had been visited by a messenger from the people of Menama (or Manyema), with letters from the Arabs staying there, and one from "the Doctor;" the letters being dated October 15th. In answer to the writer's enquiries, the messengers had told him that the Doctor was well, although he had been suffering; and that he was at the town of Manakoso, with Mahommed-bin-Gharib, waiting for the caravans, being himself without means and with few followers, only eight men, so that he could not move elsewhere or come down (to Ujiji). Sherif further stated that he had sent off to the Doctor twelve of his men, with a quantity of goods, shoes, quinine, ammunition, and so forth—all stores, in fact, of which he was in need—and that he intended himself remaining at Ujiji, to await the Doctor's orders. Another letter, written by Said-bin-Majid, from Ujiji, to a trader at Zanzibar, gave a very favourable account of the state of the country, and said that letters had come from the Arab traders at "Menama," that "the Christian" was in their company, and that the caravan intended returning to Ujiji in April, 1871. He also confirmed Sherif's statement that goods and men were sent from Ujiji to Livingstone.

The Chairman commented at some length on these interesting letters, reducing the Mahommedan dates to those of our own calendar, and showing how Livingstone had been carrying out his pre-arranged plans of exploration. For example, he had written in May, 1869, stating his intention of visiting the country of Manyema, which he described as on the borders of a lake, west of Tanganyika, and expressing his doubts whether that more westerly line of drainage, with its rivers and lakes, might not be the head-waters of the Congo. Nothing regarding the Doctor's discoveries or future plans had been communicated in these letters; it was, therefore, almost useless to speculate regarding them. He (the Chairman), however, was inclined to believe, from his knowledge of Livingstone's character, that, if he had not already satisfied himself regarding the union of Lake Tanganyika with Baker's lake, to the north, and the Nile-system, he would, now that he was replenished with men and stores, make an attempt to solve that problem before turning his face homewards. Colonel Grant gave some account of his own experiences of the country, when travelling with Captain Speke, and maintained that nothing had yet been discovered to disprove the title of the Victoria Nyanza to the position of the most elevated, and therefore the principal head of the Nile waters. The Rev. Horace Waller (who had travelled with Livingstone during the Zambesi expedition) said that the Doctor would most probably, now that he was refitted, travel independently of the Arab caravans.

A paper was then read, by Mr. R. H. Major, on "The Landfall of Columbus." The author demonstrated, by a minute comparison of Columbus's diary with an Admiralty chart, that Watling's Island, in the Bahamas, was the land first sighted and landed upon by Columbus in his discovery of America.

THE anniversary meeting of this Society took place in the Hall of the University of London, on Monday the 22nd, Sir Bartle Frere, K.C.B., in the chair. The Founder's Gold medal was presented, by deputy, to Sir Roderick Impey Murchison, Bart., the late president, in recognition of the eminent services rendered to Geography during his long connection with the Society, in the course of which he has been associated with every exploring expedition for the last thirty years, and has further stimulated and encouraged geographical research by his presidential addresses.

The Patrons' or Royal medal was then presented to Mr. Alexander Keith Johnston, Ph.D., F.R.S.E., etc., for his long continued and successful services in advancing geography, and especially for his merit in carrying out his scheme of Physical Atlases by which the varied phenomena of physical geography are displayed by means of cartography.

The annual geographical medals offered by the Society to the chief public schools were awarded to Daniel McAlister, Liverpool Institute (gold medal), and William Gershon Collingwood, Liverpool College (bronze medal), for Physical Geography; George Hogben, University School, Nottingham (gold medal), and Richard Naylor Arkle, Liverpool College (bronze medal), for Political Geography.

The President's annual address was then read, and the election of officers followed. Sir Henry Rawlinson was unanimously elected President, and Sir Bartle Frere, Mr. Francis Galton, Sir Roderick Murchison, and Rear-Admiral G. H. Richards, Vice Presidents.

The annual dinner took place at Willis's Rooms, when upwards of two hundred members and their friends supported the new President.

INSTITUTION OF NAVAL ARCHITECTS.—[WE now conclude the summaries of the papers read at the Session of this Institution, held on the 30th and 31st March and the 1st April.]

On the Calculation of the Stability of Ships, and some matters of interest connected therewith.—By W. H. White and W. John, Associates, Fellows, and late Students of the Royal School of Naval Architecture and Marine Engineering.—The paper referred to the progress of the calculation of the stability of ships, and

showed how the present system had gradually come into operation. A specimen calculation for an actual ship was given, as illustrating the method best adapted for ships of ordinary form and high freeboard. Following this exemplar ship numerous calculations were entered into with regard to curves of flotation, centres of buoyancy, and meta-centres, the technical details of which could only be given at great length, for which we have not space.

On a new method of mounting, raising, lowering, and turning gun turrets in ships.—By Rear-Admiral E. A. Inglefield, C.B., F.R.S.—The author's plan consists of a circular water-tight compartment, extending from the upper deck to the inner skin of the double bottom of the ship; an apparatus which may be likened to an inverted gas-holder is attached to the turret, and is in dimensions about two or three inches less than the compartment in which it is intended to float. At the bottom of this turret-barrel is fixed the ram of an hydraulic press mounted securely on the keelson of the ship. Thus the turret-barrel is firmly secured at its base, but is nevertheless free to rise and fall according to the length of the ram, whilst its sides are kept at an even distance all round by means of rollers at the deck-line. For bringing the turret into its fighting position water is admitted through a pipe from the sea into the water-tight compartment, thus affording to the turret-barrel a certain amount of buoyancy which is further assisted by the ram power.

The advantages claimed for the system are as follows:—

1. The ability to carry the turret at sea lower in the vessel.

2. The economy of space, and safety and convenience for the stowage of powder, shells, and shot.

3. The carrying the turning gear below the level of the water.

4. The comparative ease, certainty, and steadiness with which the turret is turned, it being nearly balanced and entirely suspended in a fluid.

5. The addition of other large water-tight compartments in the centre of the ship, and which, if the bottom were penetrated in several places, would (when of sufficient dimensions and clear of stores) be alone sufficient to keep the ship from foundering.

In the building of the vessel this water-tight compartment would form a material addition to the strength of the whole structure.

On the Measurement of Yachts and time allowance for Racing.—By Henry Liggins, Esq., Associate, Member of the Royal Thames Yacht Club.—The author stated that no subject has occasioned so

much difficulty and discussion among yacht builders, owners, and sailors, as this subject; the object being to ascertain, when two or more yachts of different sizes are sailing together, which vessel, in proportion to her size, is really the fastest.

He alluded to the rule for measurement adopted by the Royal Thames Yacht Club, which he said was devised partly with a view to disturb as little as possible the tonnage under the old law, but principally to check the construction of mere racing machines, useless as vessels for any other purpose.

He urged the adoption of a time allowance for the supposed difference of speed between cutters, yawls, and schooners, and also between yachts of different tonnages as measured by the same rule.

He alluded to the measure by displacement which would be a true basis for measurement, but many difficulties made it impracticable.

He stated that for years past some experienced yachtsmen have advocated one measurement only, viz., length. But he feared in practice this would be fatal, for it would permit unlimited breadth and depth, and encourage the carrying of unduly large sails, and foster mere racing machines; nor did he approve of the measurement of sails.

He then suggested that if it were practicable without too much cost of money, inconvenience, and difficulty, to arrive at the weight of sea-water displaced by a yacht, perhaps that mode would be open to less evasion, and be more fair for all sorts of designs of vessels than any other plan that has been proposed.

On the Measurement of Yachts, and allowance of time in Competitive Sailing.—By Charles H. Haswell, Esq., Civil and Marine Engineer, New York, Associate.—The author asserted that stability in a vessel (which is due to length, beam, and weight) is the determining element of capacity to sustain sails, *i.e.*, her capacity to carry and maintain her power of progression, and that this stability is the physical element of speed.

He stated that the existing rule of measurement of the New York Yacht Club is at variance with the physical law controlling the capacity of a vessel to bear sails, and insufficient, as it does not embrace the elements of displacement or weight and depth of immersion. The other methods that have been adopted by yacht clubs, and are yet in operation, are measurement by tonnage and by area of sails. The first method, by tonnage, is fallacious, as the result of the computation to arrive at tonnage (as operated) embraces beam and depth in direct ratios, when the former has a value as its

cube, and the latter an inverse ratio; and it uses a standard coefficient as a divisor, without any reference to the model of the yacht to which it is applied. The latter method, by area of sails, so far as it is applied, is correct in its application, as it requires of one yacht to give time to another, in proportion to the power of her sails; and, as power and stability are convertible terms, the former becomes an exponent of the latter. The application of the rule, however, without being combined with the elements of either displacement or weight, is incomplete, although it is one well calculated to develop good models or efficient hulls, as each owner of a yacht, in essaying to attain the greatest effect from a minimum of sails, would be compelled to seek a model of least resistance; but taken in combination with the elements given in the table, and the rule becomes complete in all its bearings, as power would be proportioned to capacity to bear it, and then the physical elements would be eliminated from the arbitrary, and perfect competition would be the result.

The author's conclusions after a lengthened consideration of the subject were that any allowance of time based upon tonnage, sails, area of flotation, or stability alone, is insufficient and imperfect, as they singly do not embody the elements necessary to arrive at a just estimate of the competing qualities of yachts. That the only just method of computing the relative capacities of yachts is by embodying with their statical capacity the area of sails they may carry, and thus combining capacity and power.

He submitted the following rule of measurement whereby to determine allowances of time between competing yachts, viz.:— Multiply the length by the beam cubed, and divide the product by the product of the depth of immersion from load-line to under side of garboard strake, and the ratio of displacement of the hull (compared with the volume as determined by its length and breadth at the load-line and the depth as above); all dimensions to be in feet and decimals. Divide this quotient by 15,000, and the result will give the time in minutes and decimals for an amount under 100,000, and by 16,000, 17,000, 18,000, 19,000, 20,000, 21,000, and 22,000 for amounts respectively under 150,000, 275,000, 350,000, 550,000, 850,000, 1,350,000, and 2,200,000.

To ascertain the difference of time, divide the quotient first obtained by the area of sails, and multiply the quotient thus obtained by the difference of time; divide the product by the quotient producing the least proportionate area of sails, and the result will give the difference of time in minutes and decimals.

On completing the Launching of Ships which have Stopped on their launching slips.—By William Braham Robinson, Esq., Master Shipwright and Engineer, H.M. Dockyard, Portsmouth, Member of Council.—This subject was dealt with chiefly in reference to Her Majesty's ship *Cæsar*, in 1853, and Her Majesty's ship *Northumberland*, in 1866. The mode adopted was by the application of large camels at the stern to raise the weight and break the contact of the sliding-ways and launching-slip. In the discussion which followed, Mr. Luke, Admiralty Inspector of Contracts, protested against the claim of Mr. Robinson to have been the originator of this method.

On the Positions of the Masts in merchant ships.—By William Symington, Esq., Associate.—The author considered that the present positions of the masts in our merchant ships are too far aft to obtain the best results in sailing, steering, and general working.

He stated that he had never yet been in a ship that would sail close-hauled on even keel with the helm amidships; and that there are not ten English sailing ships in existence that will do so.

By this he affirmed their progress is seriously impeded; first, by the action of the helm carried several degrees from the fore and aft line; and, secondly, being trimmed by the stern.

A ship sailing "by the stern" is impeded because she presents the entire length of the face of her keel at an angle to the passing water; and because all the "water lines" before "dead flat" meet the current at a more oblique angle than the designer contemplated.

One reason why a ship will not sail close-hauled on even keel with helm amidships, is that the masts are too far aft, and this may be proved by a "stiff ship" going "upon a wind" five or six knots an hour without perceptible heelings, when it will be found there is still "weather helm" carried.

He suggested that the mainmast be placed always in the middle length of the keel from the fore end of it, and the mizen mast at one-quarter of the same length from its after-end. For example: in a ship of two hundred feet keel, the main mast will be in the middle, the fore one twenty-five feet from the fore-end, and the mizen fifty feet from the after-end of the keel. By adopting this arrangement he contended that we should get rid of "weather helm" entirely, do away with the necessity of trimming "by the stern," materially assist the ship in tacking and ordinary working, and generally evolve the best results which our merchant ships are capable of producing; and all this without any additional expense or trouble, except by the simple process of placing the masts a little more forward.

Remarks on the present and past construction of the Navy.—By Sir William Fairbairn, Bart., Hon. Member.—The substance of this paper was chiefly to recommend

1. That strong, well-built iron vessels, varying from 3,500 to 4,000 tons burthen, carrying from four to six 350 or 400-pounder guns, having fine lines and great speed, appear to be the class of vessels which would form an important addition to our naval force.

2. That such vessels be protected, in the line of the neutral axis, by a belt of iron armour plating, varying from three to five feet above and below the water-line, according to size, all round the ship.

3. That in cases where the battery is broadside and at midships, the armour plating to be carried up to a sufficient height on both sides to protect the guns, as shown in the case of the *Penelope*.

In these recommendations the cellular system, longitudinal keelsons, etc., were strongly recommended, and the Controllers of the Navy (Sir Spencer Robinson and Mr. Reed) were not slow to avail themselves of them; and hence followed the *Penelope* and the *Bellerophon*, two of the strongest built vessels in her Majesty's Navy.

The author stated that he had ventured on these observations to show what may yet be required to render the navy more efficient, particularly by the introduction of a class of vessels of medium dimensions, light draught of water, and such as are suitable to navigate the Baltic Seas, and reach the innermost recesses of the defensive works of hostile nations.

On the working expenses of steamers of small size.—By A. F. Yarrow, Esq.—The author advocated the use where possible of small steam launches propelled by one or two screws driven by high pressure direct acting engines. He referred to their successful working at Plymouth, and he strongly recommended that they be tried in the Thames instead of the present steamboats. He also urged the adoption of a plan of condensation of steam, by passing the exhaust pipe along the outside of the boat, the external surface coming in contact with the water, and thereby condensing the steam within. He referred to some experiments made by him which were eminently successful, and he believed the plan is capable of extensive adoption at a nominal cost.

On the commercial economy of several types of merchant steamers on some of the principal lines of steamship traffic.—By Walter C. Bergius, Esq., Glasgow.—The author of this paper shewed by diagrams and figures, that the cost per ton of cargo carried per mile ranges from

0·031 penny per mile in the most economical class, the German Ocean water-ballast collier, to 0·165 penny in the dearest, the North Atlantic mail steamer; the cost of conveying by the foreign coasting steamers being about a penny per ton per mile; and he stated that his object in submitting the figures and diagrams was not so much to convey information concerning any novel or extraordinary facts, as an attempt to arrange and reduce to practice, from a commercial point of view, some general items of the present economical conditions under which goods are carried on some principal lines of steamship traffic.

On the examination of adjusters of compasses.—By Thomas Brassey, Esq., M.P., Associate.—The author called attention to the incompetency of many, if not most, so-called compass-adjusters, it being maintained that, in view of the fact that total losses of iron ships, owing to local attraction upon, or defects of, their compasses being very frequent, it is essential that the competency of persons undertaking the difficult and delicate work of adjustment should be guaranteed by examinations and certificates under a council to be appointed for that purpose.

The depolarization of iron ships.—By Mr. Chas. F. Henwood, Member.—The author alluded to the invention of the late Evan Hopkins, C.E., F.G.S., by which the sub-permanent magnetism of an iron ship, the principal cause of the deviation and consequent depreciation of the compass, is stated to be completely and permanently removed. The paper contained a number of extracts, and a table showing the deviations of the compass of H.M.S. *Northumberland* before and after depolarization.

Richard Cobden, iron sailing ship.—By John Grantham, Esq., C.E., Member of Council.—The author observed that he presented his paper to the institution more as an historical record of a remarkable vessel, one of the earliest class of iron sailing ships, than from any idea that it will add much to our knowledge of ship building, or be an example to follow.

The vessel was built in 1844, and was broken up last year. She had been much employed in the China and other trades. She was a small carrier, and in her time did a great deal of work, was a favourite vessel, always tight and seldom if ever damaged any cargo.

On a vessel in motion, and what becomes of the water she disturbs.—By Henry Ransford, Esq., Associate.—The author submitted the

results of many careful observations as to the effects on water by a vessel in motion, and the inference he drew from the facts gathered from his observations was, that all bows strike the water at a right angle from the plane of their curve; consequently what is considered an ordinary good bow, strikes the water with a downward as well as a side force, thus giving the particles or stratum of water, when first set in motion, a partially downward direction; then moving upwards in a curved line (the curve depending on the resistance received) until a wave is forced up on the surface, equal in bulk to the displacement, between the stem and the extreme beam of the vessel.

He likewise asserted that the water close to the vessel's side sank down to occupy the space she was leaving.

He believed it might be accepted as an axiom, that the limit to the speed of a steamboat, however powerful the engines, is the rate at which water will flow in to fill up the space she leaves; and further, that the following must be recognised as laws in hydrostatics, viz., any ship or vessel floating in water can only move through the same by forcing to the surface a body of water of equal breadth and depth to its immersed midship section; and the bows of all ships in motion impel the water they displace at a right angle to the plane of their curve.

This paper naturally enough called up Mr. Scott Russell, who spoke at some length in support of Mr. Ransford's theories.

On sheathing iron ships.—By Howard Ninnis, Esq., Associate.—The general tone of this paper was to the effect that the strength of iron ships is mainly dependent on the quality of the material and workmanship, and that the quantity and weight of the iron put into ships were excessive and detrimental as sacrificing the more important elements above specified; moreover, that there has been a progressive deterioration in the quality of iron plates used in shipbuilding, due to the rage for cheapness among shipowners.

The author suggested a method of using copper by which the evils of close proximity between the copper and the iron would be avoided. He proposed to fix a stout wooden sheathing about two inches thick directly on to the hull of the vessel, and on this inner wood sheathing he proposed to place a layer of gutta percha, of $\frac{1}{4}$-inch in thickness. This is intended to form a perfect insulator between the copper and iron, and likewise insulate the fastenings securing the inner wooden sheathing to the hull. Outside this gutta percha it is intended to fix another layer of timber of one-inch thickness, which shall be secured by brass screws to the inner

planking, or by the ordinary wooden bolts. The copper is then to be attached in the usual way, except that screws ½-inch long shall be used instead of the ordinary nails.

On further experiences of the applicability of zinc for sheathing iron ships.—By Chas. F. T. Young, C.E., Associate.—This gentleman strongly advocated the use of zinc for sheathing iron ships. He alluded to the numerous high authorities who had deprecated the use of copper or yellow metal for iron vessels, on account of the injurious effects produced by the juxtaposition of the two metals, and he adduced important testimony as to the efficiency of zinc.

On the steering of ships.—By Evan Leigh, Esq., Engineer, Associate.—With the view of giving perfect and instantaneous control over the steering of a ship the author proposed to place a helm fore and aft, and connect them together in such a manner that the force derived from the enormous pressure on the fore-helm, when it is turned aside, is made available for bringing up the aft-helm in the opposite direction, and the ship swings round instantly. The helms being in equilibrium, any boy may easily work them, and the largest vessel afloat may be made to stagger on the water, first to one side and then the other, by simply pointing the fore-helm alternately to starboard and larboard so long as the ship is in motion.

The proposal was however characterized by speakers as displaying a want of knowledge of principles and previous experiments.

On a pneumatic sounding machine.—By Walter C. Bergius, Esq., Glasgow.—The author alluded to the fact that correct soundings are dependent entirely on the vertical position of the sounding line, and he submitted an instrument by which the pressure of the head of water in which it was immersed would indicate the depth. Such an instrument would be specially valuable to vessels going rapidly through the water, for it will indicate for instance, an actual vertical depth of thirty fathoms, although there may be sixty fathoms of stray line overboard, consequent upon the progress the ship made during the operation of the sounding. It would also obviate the awkward possibility of a mistake being made in feeling for the knots of the sounding line in the dark on deck, as it is carried, with the indicating water in it, up to the bridge or into the chart-room for the inspection of the officer on duty.

ROYAL UNITED SERVICE INSTITUTION.—On Friday, 19th May, a lecture was delivered by Captain Henry Toynbee, F.R.A.S., etc., on "The winds of the North Atlantic." The author commenced by referring to the relation between winds and the barometer, and especially alluded to Buys Ballot's Law, that the difference of barometer readings ranges in a line nearly at right angles to the wind, so that by turning the back to any wind there will be a lower barometrical pressure to the left than to the right, whilst the strength of that wind will be related to the amount of difference between the barometers in a given distance. The force of wind was stated to be also regulated by the difference in the barometer readings over a given distance, which is called the barometrical gradient. The lecturer then proceeded to state that the prevailing winds of the North Atlantic are related to certain prevailing areas in that ocean, of high and low barometer, which areas were indicated on explanatory charts. Several instances were adduced to shew how this theory applies;—the areas alluded to were always found to influence the neighbouring winds, and the known prevailing winds were always found to be attended by high and low barometrical pressure at right angles to them.

Allusion was made to the West India hurricanes, and to the gales of high latitudes. With regard to the former it was shewn that as an area of high pressure exists to the north of where they originate strong easterly winds may be expected, also that a steep gradient on all sides causes the circular motion of the wind. The gales of high latitudes however being bounded on the north by areas of low pressure, the winds are generally strong from the west. In confirmation of these statements various commanders of steamers which cross the Atlantic had recorded their experiences, which fully bore out the above theories. It was stated that waves of low pressure often travel to the eastward across the Atlantic accompanied by strong gales, and also that frequently a steamer escaped the gale by travelling faster than the area of low pressure, *i.e.*, although the wind might be travelling at the rate of sixty miles an hour, yet that wind is only the internal action of a wave of low pressure which may be travelling only ten or twelve miles an hour;—a hurricane for instance may sometimes stand still, blowing furiously at the same time. From barometrical information collected by the Meteorological Office it appears that at the time of the loss of the *City of Boston*, a deep area or wave of low pressure prevailed to the S.W. of Halifax, accompanied by a gale of hurricane force, which was experienced by several ships in the neighbourhood. One of the ablest commanders in the same line thinks she was running

before this gale, and came suddenly upon a field of ice, which would most likely have caused her to founder at once.

The cause of these areas of low pressure is not yet understood, but the lecturer was of opinion that the close proximity of hot and cold water has a good deal to do with it. In adverting to the cause of wind, the lecturer alluded to the mechanical theory, which attributes the prevailing westerly wind of high latitudes to the influence of the moon, and supposes that all other winds are but diversions of this original westerly wind, produced by the obstruction of the coasts which bound the sea; and to the temperature theory by which heated air in one spot would expand and rise, whilst the cooled air would contract and lie lower, leaving room above it for the heated air to flow in and cool down; and he stated that a combination of these two theories seemed to account for much that is known of the winds of the North Atlantic.

After a few remarks on the effect of seasons on areas of high and low pressure, and on the apparent cause of our easterly winds in spring,—which he suggested might be a body of air rising in Africa or Southern Europe, and flowing northward as an upper current, then descending where the sun's influence is weaker and the air lies lower, viz., to the North of England,—the lecturer concluded by saying how much there is yet to be learned on these matters, and by expressing his hope that the observations now being made by the Meteorological Office, may help more and more to unravel the principles which govern the winds of the Atlantic, and all other parts of the world.

On Monday the 22nd, a paper was read at the Institution, on "The Formation of Naval Reserves—Officers and Seamen—for the Royal Navy," by Captain Gardner, R.N.; Admiral Ryde, R.N., presided. The author showed that from the days of Elizabeth down to our own, the ranks of the Royal Navy had, owing to impressment, rigid discipline, and inadequate pay, as compared with the merchant service, not reached their full strength. The Crimean, American, and late Continental wars had shown the necessity for England to be prepared with a Naval force double its present strength, especially as the Army was inferior to those of other great nations. The present force of the Naval Reserve amounted to 15,000, exclusive of officers. That number showed that notwithstanding all the efforts made to popularise the Royal Navy, the men still gave preference to the merchant service, in which they were better compensated, and under a less rigid discipline. He suggested the formation of a Naval Reserve of 50,000, divided into three

classes, drawn voluntarily from the reserve of A.Bs. of the merchant service, etc., and including stokers, whose ranks could be augmented from boys' training ships. With such a Naval Reserve properly treated, England would be in a position to hold her own in case of war. In the discussion which followed, one speaker maintained that in the event of a war, an appeal to the patriotism of British merchant seamen would fill the ranks of the Royal Navy.

NEW BOOKS.

The Boy's Manual of Seamanship and Gunnery, for the use of Training Ships of the Royal Navy. By Staff-Commander C. Burney, R.N., Superintendent of Greenwich Hospital School. London: Warne and Co.

It is a much more simple thing to write a book for adults than for boys, be it for pastime or instruction; and in the latter case, to confine language to suit the mind and understanding of a lad, at the same time to lead him on from one step to another without his considering it a task, is at all times difficult to accomplish. But we consider Captain Burney has succeeded in doing it, for his instructions for knotting and splicing, fitting rigging and sails, learning the names and uses of ropes, etc., are so clear that a boy of ordinary intelligence can readily teach himself, and this employment is so fascinating that boys will even give up their play hours to instruct themselves. We can imagine a boy poring over his thumb-marked "Manual" with almost as much gusto as he would over Robinson Crusoe.

As the title implies, gunnery and small arm exercise form a part of the work; to this we may add boat exercise, compass, signal, lead and log line instruction, etc.; in fact, we have tried to discover what it does not teach that a lad should know who is intended for the sea. Although the work is specially arranged for those intended for Her Majesty's Navy, we consider it equally applicable for youths intended for the Merchant service, and if these last named are even taught gunnery and the use of small arms they will make no worse men for the knowledge; it would at any rate save them much drudgery of practice should they ever become members of the Royal Naval Reserve. We can also commend this unpretentious volume to schools, and even the adult land lubber would find it of great

use at the sea side, for by its aid he would be able to tell the difference between a schooner and a brig and to tie a knot that a fisherman would not laugh at. If our readers are puzzled to know what to give Tom or Bertie on his birthday, let him give him a copy of this "Boy's Manual;" we will answer for its being appreciated.

Notes on the Natural History of the Strait of Magellan, etc. By Robert O. Cunningham, M.D., F.L.S., etc. Edinburgh: Edmonston and Douglas. 1871.

Dr. Cunningham is unhappy in the title of his book. It might be more appropriately termed "A narrative of the voyage of H.M.S. *Nassau*, with Natural History notes;" and as such it might fairly be accepted as a tolerably readable book for those who like gossiping over small matters. For the higher purposes of scientific men, Dr. Cunningham's book we fear will not be available, it reads too much like ordinary conversation on unimportant details, and it seems to be put together in a casual and unsystematic manner. We do not say that there is nothing valuable in this work, but we say it is difficult to find it. The facts which he relates are generally hidden by a superabundant mass of petty and uninteresting details which weary the reader long before he comes to anything remarkable. If the book had consisted of one hundred instead of five hundred pages, and had been purged of all the dross which accompanies the pure metal, we consider it would have been a useful and interesting work; now it is a difficult task to read it.

Throughout his three years' expedition the author seems to have been always observing and recording both on land and at sea, and everything is set down in his book with scrupulous fidelity. The consequence is that a quantity of unnecessary details choke the more important facts. It is very evident that Dr. Cunningham was heart and soul in his work, and there are many latent signs in his book that he is well versed in his special department as a naturalist. But we must say that in the book before us we think he has neither done justice to his subject nor to himself.

From the President of the Royal Geographical Society's address, we learn that Captain Allen Young, R.N.R., who accompanied Sir Leopold McClintock in the *Fox* in his memorable search for Sir John Franklin, intends to explore, as far as possible, the interior of the fiords of East Greenland, in his own yacht. We cordially wish Captain Young every success.

COMMUNICATIONS.

Standards for Soundings.

When the navigator is about to enter a strange port, with a large ship, he closely scans the depth of water in the channels and anchorage. If he be in a merchant ship and is desirous of a speedy departure on his voyage an inside berth is selected, so as to communicate with the shore easily. Now it frequently happens, especially on the coast of England, that the range of tide given in the tide tables and charts is misunderstood, and the ship "sews" or sits on her anchor. The mean range of tide for Portsmouth is twelve feet eight inches, according to the Admiralty tide table, but during the equinoctial springs it frequently ranges fourteen feet eight inches, and sometimes more. The result is that many masters of vessels are caught by the receding tide and lie helplessly aground till the flood makes. I have seen the Ryde ferry steamers lose a turn from this cause, to the manifest discomfort and annoyance of all on board. In the harbour of Portsmouth large ships of war take the ground, when according to the tide table, they should have several inches of water under their bottoms.

It is a well known axiom that the strength of anything must be measured by its weakest part, and I therefore maintain that all charts should be marked for low spring range in lieu of the mean. If this be not done a note should be inserted, stating that at extraordinary springs the fall would be greater than that marked, and thus enable the seaman to guard against such a dangerous contingency. There are thousands of men in charge of ships who have not the most remote idea that a chart can lead them into error, and who are quite ignorant of the difference between mean and extreme spring range. It is idle for surveyors to say they ought to know if it be not explained with all possible distinctness in their work, and the hard working merchant seamen of England have but little leisure to examine into the laws on which charts are constructed.

M.

[Our esteemed correspondent who has sent us the above contribution is much impressed with the importance of the subject, but in reference to it we must observe that the datum to which the soundings inserted in the charts are reduced, viz.:—to low water *ordinary* springs, is so well known and understood that to introduce a new one, as suggested by our correspondent, would only tend to confusion and error, inasmuch, as if the soundings were to be reduced to low water equinoctial springs, it would be necessary to delineate the features

of rocks and the shore at the same level, and this would obviously be impossible, as it could only be done for a few hours in each year, in March and September. We cannot think that, as our correspondent asserts, there are thousands of men in charge of ships who are ignorant of this simple fact, and even if they were they have plenty of time when in harbour, or even at sea, to make themselves acquainted with the principles on which charts are constructed, or at least to read the notes beneath the title. The master of the Ryde ferry-boat, if ignorant of the tides on his own beat, is, in our opinion, not competent to hold his post: moreover we were not aware that the steam ferry-boats were dependent on Admiralty charts for their navigation.—ED.]

THE DETERMINATION OF A SHIP'S PLACE.

To the Editor of the Nautical Magazine.

SIR,—In your April number there is a paper reprinted from the transactions of the Royal Society, referring to the so-called "Sumner's method." It states, "That the excellent and ingenious idea of calculating the longitude with two different assumed latitudes is due to Captain T. H. Sumner."

It is quite true that Captain Sumner published a pamphlet calling public attention to this "method," and so far deserves credit, but it had been in habitual use fifty years ago, by those who felt the responsibility devolving on the person charged with the safe conduct of a ship, and who were well aware that "latitude by dead reckoning" was subject to error.

If I am not mistaken, it will also be found in the Spanish work on Navigation by the well-known Mendoza del Rios.

It should be a standing order that sights be obtained as early as possible (for choice when the sun bears east), and again about six bells. Getting the time from these with two latitudes, varying from 60° to 20° according to circumstances, the calculated intervals of time may be compared with the observed, and thence the latitude be determined either by simple proportion or from the altitude nearest noon. You thus become independent of the noon observations.

This method, as well as all dealings with double altitudes, fails in low latitudes, but in tropical climates the sun is rarely wanting at noon; of course, the same process gives the longitude, so far as the chronometer used can be depended on.

The "double altitude" is a most valuable method of getting the latitudes. In its simplest form it is getting the error of the watch from sights taken when the sun or star bears nearly east or west, when the error of time, arising from an error of latitude, is a minimum, and then getting sights when the body bears nearly

north or south, when a small error in the time is of little moment. Old Douwes' method has been well abused, but I doubt whether a "double altitude" was ever worked out by the "direct method" for practical purposes.

Your obedient,

CHAS. R. C. BETHUNE, *Admiral.*

24th May, 1871.

[We do not doubt that Sumner's method of calculating the longitude from two different assumed latitudes had suggested itself to, and to some extent had been acted upon by, other practical navigators before Captain Sumner reduced it to practice and published his method. We cannot find it alluded to in Captain Mendoza Rios' work, but are quite disposed to believe that in a crude state the idea had been working in many men's minds for some time. Admiral Bethune's practical remarks on the subject are well worthy of consideration, for they are the results of a long experience and devoted attention to the profession of navigation. At the same time, however, we would observe that the efficacy of double altitudes cannot be relied on at all times, for instances have occurred where the sun was too much in the zenith for meridian altitudes, and although double altitudes were observed under very favourable conditions, yet they failed to give satisfactory results.—ED. N. M.]

A NEW EXPLOSIVE.

PROFESSOR ABEL, Chemist to the War Department, has, after prosecuting numerous experiments, succeeded in perfecting the new explosive agent recently produced by him under the name of picric powder, as a material for charging shells, which, though not so violent in its action as gun-cotton, nitroglycerine, or picrate of potash powder, is a much more powerful explosive agent than gunpowder, and has other properties which appear to render it peculiarly adapted for employment in shells. Its merits are that it may be readily and expeditiously prepared, and that it is remarkable for its safety as compared with all other explosive agents, being somewhat less sensitive to ignition by percussion than gunpowder. The President of the Committee on Explosives at Woolwich having pronounced the new powder worthy of further experiment, it will be tried under various conditions, in order to ascertain its suitability to the requirements of the Service.

MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
30	United States—Washington Territory—Rosario Strait.	Discovery of a rock.
31	Red Sea—Jubal Strait—Jubal Strait Bank.	Shoal water on.
32	North Sea—Jahde River entrance.	Establishment of a Light Vessel.
	Great Belt—Martha Flat.	New buoy placed.
33	Scotland—East Coast—Corsewall Light.	Alteration in speed of revolution.
	Scotland—Frith of Forth—Queensferry.	Wreck in fairway.
	Ireland—Dublin Bay—Howth Bailey Lighthouse.	Establishment of Fog-signal.
	England—East Coast—Souter Point.	Establishment of Fog-signal.
34	United States—Salem Harbour—Hospital Point.	Establishment of a light.
	United States—New York—Plum Island.	Establishment of a Fog-signal.
	West Indies—Cuba—Havanna Harbour.	Buoys.
35	China Sea—Labuan—Victoria Harbour.	Displacement of Beacons.
	Philippine Islands—Manila Bay—Pasig River.	Re-establishment of Light.
36	Japan—Yedo Gulf—Cape Sagami	Establishment of a light.
37	Scotland—North Coast—Cape Wrath.	Alteration in speed of revolution.
38	Mediterranean—Cartagena—Escombrera Island.	Replacement of the Buoy on Shallows.
	Mediterranean—Sicily—Palermo.	New Mole and Light.

(All bearings are Magnetic.)

NAUTICAL NOTICES.

30.—*United States—Washington Territory—Rosario Strait.*—A sunken rock *(Lawson rock)* with 3 fathoms on it at low water springs lies S.W. by W. ½W., one and six-tenths of a mile from the west point of Deception Island, at the entrance of Deception Pass.

31.—*Red Sea—Jubal Strait Bank.*—A shoal coral patch of 18 feet has been discovered in lat. 28° 10′ 15″ N., long. 33° 28′ 40″ E., and two miles N.W. of it another shoal of 24 feet. There are no outlying dangers off the neighbouring coast of Ras Shukhuir which may be approached to one mile.

32.—*North Sea—Jahde River Entrance.*—A light vessel, with two *fixed white* lights, one elevated 50 feet, the other 34 feet above the sea, on separate masts, has been placed in the Jahde river, outside the line of the white buoys, between Nos. 4 and 5 buoys, in lat. 53° 48′ 43″, long.

8° 1′ 24″ E.; the lights should be seen 9 miles. The vessel is painted red with the name *Aussen Jahde* on the sides; she has three masts, with black skeleton balls on fore and mizen masts, and during the day the North German pilot flag is hoisted. Should the light vessel not be in position, neither the distinguishing marks nor the light will be exhibited. During foggy weather, a bell will be sounded for one minute, with an interval of three minutes. Vessels should pass to the westward of the light vessel.

Baltic Entrances—Great Belt—Martha Flat.—A *red* buoy, with red basket work, pole and two brooms, has been placed on the south end of Martha Flat. It lies S. ⅜ W. 8 miles from Hielm lighthouse, and N.W. (northerly) 9 miles from Seiero point lighthouse.

33.—*Scotland—West Coast—Corsewall Light.*—The alternating red and white light is changed from a flash every two minutes to a *flash every minute.*

Scotland—Frith of Forth—Queensferry.—A wreck lies in the fairway between the moorings of the *Repulse* and the Whales-back shoal; a buoy has been placed near it.

England—East Coast—Souter Point.—A powerful fog-horn has been placed on the point seaward of the lighthouse, from which, during foggy weather, blasts will be emitted at *intervals of forty-five seconds.*

Ireland—Dublin Bay—Howth Bailey Lighthouse.—In foggy weather, a fog-horn will be sounded, each blast being of *five seconds* duration, with an interval of *twenty seconds* between each blast.

34.—*United States—Salem Harbour—Hospital Point.*—A *fixed white* light of third order has been established on Hospital point, 35 feet above high water.

NOTE.—This light will be seen in line with the highest of the two lights on Baker's Island. When in the centre of the channel, between Baker's Island and Little Misery Island, the light will appear more brilliant than on either side, and thus seen, serves as a leading mark to clear the dangers.

United States—New York—Plum Island.—A fog-bell has been established at the lighthouse, which will be struck by machinery at intervals of *fifteen seconds* in foggy weather.

West Indies—Cuba—Havanna Harbour.—In October last, there were only four buoys marking the entrance, viz., two *red* buoys on the east side and two *white* buoys on the west side; the outer, or point buoy, had been removed or had broken adrift.

35.—*China Sea—Labuan.*—Mariners are cautioned in approaching Victoria harbour, not to place confidence in the arrangement of the beacons as placed on the charts, as the Columbine beacon, and the three beacons on the west side of the bank to the northward of Daat island do

not exist. The beacon on the Harbour shoal is placed near the centre of the shoal.

Philippine Islands—Manila—Rio Pasig.—The light on the north mole has been re-established in the same position as formerly. The light is a *fixed red* light which should be seen 8 miles.

36.—*Japan— Yedo Gulf—Cape Sagami.*—A second order *flashing white* light, showing a flash *every ten seconds*, visible seaward from E. by N. to S.W. ¼ W., has been established on Tsuruga-saki, Cape Sagami, west side of the entrance of Yedo Gulf in lat. 35° 8′ N., long. 139° 41″ E. It is elevated 110 feet above the sea, and should be seen 16 miles. A *red* sector of light of 16° extending from the last bearing of the white light to S.S.W. ¾ W., is added to cover the Plymouth rocks.

37.—*Scotland—North Coast—Cape Wrath.*—From the 12th June, the revolving red and white light on Cape Wrath will be changed from a flash every two minutes to a flash *every minute.*

38.—*Mediterranean—Cartagena.*—A *bell-buoy* has been placed on the shallows near Escombrera island.

Mediterranean—Sicily—Palermo.—A new mole is in the course of construction to protect the Southern bay, it will be 250 feet long, and lie in same direction as the old mole. A *fixed green* light, visible 2 miles, is hoisted on a mast on the emerged portion, and the extreme end is marked by two buoys, each with a red and white staff and white ball.

HYDROGRAPHIC.

[The following particulars are extracted from information published by the Admiralty.]

San Francisco Harbour, California:—from the remark book of Navigating Lieutenant John J. A. Gravener, of H. M. S. *Zealous*, April, 1870.

The Blossom Rock has lately been removed by blowing up, and there is now 24 feet at low water over the site.

The Presidio Shoal and Anita Rock are both marked by buoys.

The Bell Boat formerly placed on the bar has been permanently removed.

The Four Fathom Bank Buoy, off the entrance of the harbour, has been washed away, and it is reported will not be replaced; but it is intended to place a buoy on the inner or eastern end of the Four-fathom bank, as a guide to vessels using the Eight-fathom channel.

Tides.—Between Fort point and the northern shore of the Golden Gate the ebb tide frequently runs with a velocity of 6 knots. A wide berth

should be given to the Fort point, as the eddy tides often carry vessels dangerously close to it.

RAPA ISLAND, lat. 27° 36′ S., long. 144° 11′ W.:—from the weather register of Captain D. E. Mackellar, sent by the Meteorological Office, 1870.

Winds and Weather.—The prevailing winds during eight months of the year, from October to April inclusive, are from the eastward, but about once in three weeks during the summer, westerly winds occur for a short period.

From May to the middle of September westerly winds prevail, blowing in heavy gusts, with rain, down the valleys of Ahurei bay, owing to the harbour being open to the eastward and landlocked in other directions.

From native report hurricanes are sometimes experienced on this island, destructive to houses, and rooting up the cocoa-nut trees. There are no cocoa-nut trees at present on the island.

A peculiarity of this island is the absence of surf and swell; a boat can land without risk at any part where not too precipitous. There are no known dangers half-a-mile from the shore.

ISLANDS BETWEEN GILBERT AND FIJI ARCHIPELAGOS:—from Commander Henry J. Challis, R.N., of H.M.S. *Rosario*. 1870.

Byron Island.—The south point of this island lies in lat. 1° 25′ S., long. 176° 40′ E., about 60 miles westward of the position assigned to it on chart No. 2464.

Peru Island.—The south point of this island lies in lat. 1° 25′ S., long. 176° 2′ E.

Sophia Island.—The centre of Sophia island was found to be in lat. 10° 46′ S., long 179° 31′ E.

On the 5th of November, 1870, the *Rosario* passed 3 miles westward of a doubtful reef shown on chart No. 2464, in lat. 12° 30′ S., long. 176° 30′ E., without observing any signs of shoal-water, and as there are other strong corroborative proofs of its non-existence, it has therefore been removed from the chart.

On the 7th of November, 1870, the *Rosario* passed 4 miles westward of the position of Onaseuse or Hunter island, said to be situated in lat. 15° 31′ S., long. 176° 11′ E., but no land was seen from the mast-head. Mariners navigating these seas assert that this island is not in the position assigned to it on the chart.

The above longitudes depend on the meridian of the school-house, Levuka, Ovalau, Fiji islands, being in long. 178° 49′ E.

TAURANGA HARBOUR:—from Commander George Palmer, R.N., of H.M.S. *Rosario*.

Vessels approaching Tauranga harbour, should bring Maunga-nui to bear South, and steer for it until within 2 or 3 cables of the North rock.

For some hours after a northerly or easterly gale, the bar breaks right across from the outer Middle bank, to Maunga-nui.

The inner Middle bank has extended three-quarters of a cable towards Maunga-nui, whilst the channel has deepened considerably.

An experienced pilot is employed to look after the buoys, but their being in position cannot be depended on.

The *Rosario*, drawing 14 feet, has been frequently up the harbour at spring tides, as far as Te Papa.

Owing to the strength of the tide round Stoney point, and the tendency of the channel to decrease in width, vessels of small steam-power are recommended to wait for slack water, before entering Tauranga harbour.

OTAGO HARBOUR:—by the Harbour Master of that port, Mr. William Thomson, received from the Colonial Office, Wellington, 1871.

The least water at present in the north or main channel is 22 feet at low-water springs, no change having taken place since May, 1870.

In the old channel, which is a short cut into the harbour across the bar, much used by vessels not drawing more than 18 feet, there is now 15½ feet at low-water springs, and 20½ feet at high water ordinary tides, being 18 inches more than in May last.

The mean rise at high water at the heads is 4 feet 9 inches, which will give in ordinary tides, in the north or main channel, a depth of 26 feet 9 inches, being sufficient for vessels drawing 22 feet to enter, except when a south-east sea sets in on the coast, which rarely occurs.

For many years in the old channel there was not less than 18 feet at low water; it was then used by all vessels visiting this port, some of them being ships of 2,100 tons, and drawing 21 feet; but the great tidal wave of August, 1868, suddenly reduced the depth to 12 feet at low water, thereby necessitating the use of the north or main channel for large vessels. The north channel, by the same disturbing element, was, on the other hand, much improved, owing to the outer end of the bar being washed away; but since that date, the bar has been slowly, but surely, returning to its original dimensions.

In the channel across the inner bar there is at present not less than 18 feet at low water spring tides, being 2 feet deeper than in May last. The usual process of change is going on here. A ridge forms nearly across the channel, shallowing to 15 feet, then breaking through on each side, leaving a knoll in the centre. At present there is at low water a small knoll with 14½ feet, and 18 feet all round.

In conclusion, the capabilities of the port of Otago could not be better shown than by the fact that the ship *Achilles*, of 1,520 tons register, drawing 21½ feet of water, was on the 3rd of July last, safely piloted into this harbour, and anchored at Port Chalmers in the dark; also, that only three wrecks have occurred at the entrance since the formation of the settlement. As these wrecks, with ordinary management, might have been avoided, they cannot be received as evidence that the entrance to this harbour is dangerous, and it is stated that a larger amount of shipping has visited Otago Harbour, and fewer casualties have happened therein, than in any of the other principal ports of New Zealand.

YANG-TSE-KIANG :—from W. H. Medhurst, Esq., H.M. Consul at Shanghai, 1871.

Lang-Shan Crossing.—A new survey of the channel known as the Lang-Shan crossing in the Yang-tse-kiang, has lately been made by Commander Homer C. Blake, of the United States Ship *Alaska;* and a new arrangement of the lightship and buoys to meet the observed changes was made, in March, 1871, in the Lang-shan crossing, and also in the Confucius channel.

Lang-Shan Light Vessel is moored in the fairway of the channel in 7 fathoms on the following bearings :—Lang-shan pagoda, N.N.E. ¼ E.; Plover point (extreme), S.E. by E.; Flat tree, S. ⅛ W.; Fu-shan fort, S.W. by W. ⅛ W.

Waterman Buoy, Black, is moored on the eastern point of the Waterman or Middle Bank with—Lang-shan pagoda, bearing N.E. ⅛ N.; Lang-shan light-vessel, S.S.E. ¼ E.; Fu-shan fort, S.W. by S.

North Bank Buoy, Red, is moored on the south-west point of the Lang-shan flats with—Plover point, bearing E. by S. ¾ S.; Flat tree, S.W. ¾ S.; Fu-shan fort, W. ⅛ N.; Lang-shan light-vessel, N. by W. ⅛ W.

Confucius Channel.—The *red* buoy heretofore moored on the south-west side of the Actæon shoal will be painted with *black and white stripes,* and remaining in its present position will be called the Fairway buoy.

Centaur Buoy, Black, is moored on the eastern edge of the Centaur bank with—Fairway buoy in line with Fork tree, S. by E. ¾ E ; Great bush, S. by W. ⅛ W.; Plover point, W. ⅛ N.

Actæon Buoy, Red, is moored on the south-west end of the Actæon shoal with—Fork tree, bearing S. ⅛ E.; Great bush, S.W. by W. ⅛ W.; Fairway buoy, N.W. ⅛ W.

[*All Bearings are Magnetic.*]

GENERAL.

ROYAL NAVAL FEMALE SCHOOL.—The Annual Meeting of this School was held at the Royal United Service Institution on the 6th May, Admiral the Hon. A. Duncombe, in the chair. The Report shows that the school is progressing very favourably, the number in the school being that at which it is limited, viz., eighty-seven; of these no fewer than fifty-six are educated at the almost nominal cost of £12 a year, the remainder—excepting five nominees of the Commissioners of the Patriotic Fund at £10 a year each—paying the full scale of £40 a year.

When we consider the above figures, we cannot but feel how great a benefit this Institution confers on the families of officers in

the Navy, too many of whom are left to struggle through the world with the bare pittance of the widow's pension, supplemented by the compassionate allowance to the children. The difficulties in the way of obtaining a good education for the girls of such families are undoubtedly very great. Their straitened means forbid the luxury of a high class school, and the social position of the family prevents them from seeking to take advantage of the numerous charitable institutions which exist; indeed, in many cases an application on behalf of the children of an officer would be met by the answer that the institution was not intended for such as they.

The Royal Naval Female School helps to make things better for the distressed families of officers. We say *helps* in order to distinguish it from mere giving. It is a refined charity which requires from the recipient something to take away the sense of absolute dependence on others; and some small payment is required at this school which, however difficult to make, is made with cheerfulness by those whose daughters are under the care of the Institution.

That the objects for which the Institution was established have been fully carried out we honestly believe, and that there are many now getting their living by means of the good and sound education they received at the school, we know, and it is with no undue wish to enforce its claims that we say that, with the fellow Institutions, viz.: The Royal Naval Benevolent Society and the Royal Naval Schools at New Cross, the name of every commissioned officer in the navy should, as a mere matter of prudence, be on the list of Subscribers.

We cannot conclude this notice without drawing the attention of the officers of the Mercantile Marine to the fact that the daughters of officers of the Royal Naval Reserve of ward-room rank are admitted to the school on the same terms as their brethren of the Navy, and we are glad to see the name of one Lieutenant R.N.R. on the Committee of Management.

Royal Alfred Aged Merchant Seamen's Institution.—We are anxious to draw attention to this very worthy establishment. It is only a few years back since the Belvedere Institution was founded as a Harbour of Refuge for such ancient mariners who have been long tossing about on life's sea, who, when their vigour weakens and physical power fails, are in want of shelter and rest. Many there are, we doubt not, of such old sailors who have no family ties, and to whom the offer of a home such as this Institution offers, seems almost like the first step towards heaven. Such establishments as these are splendid witnesses of the good which underlies society,

how the strong and rich seem generally willing to do what they can to assist the poor and weak; and we are sure that it only needs that it should be widely known that an Institution supported by voluntary contributions exists for the purpose of making some people more happy and contented, and plenty of kind hearted people will be ready and willing to aid the good cause. We therefore consider it our duty to lend what aid we can in making known the noble purpose of this Institution. As the stay and glory of our land is mainly due to those of our countrymen who go down to the sea in ships, we feel that the purpose of this Institution to succour those who have lived to benefit their country, makes it a national affair, to each and all of us; and as most of the readers of the *Nautical Magazine* are those who have their business in the great waters, we should think it very strange if a warm sympathy did not impel them to do their best to assist such worthy efforts.

Armour-plate Trials.—In the early part of the month a trial was made at Shoeburyness against the armour-plates as fitted on the *Glatton* and *Devastation*. The first target consisted of two outside plates of iron 14 inches thick, bent to represent a segment of a circle of the same radius as a turret, bolted on to a backing composed, first of vertical teak uprights 9 inches square, these being crossed in the rear by horizontal teak supports 6 inches square, and finally an iron skin 1¼ inches. The second target was made up of two external iron plates 8 inches, on 6-inch teak uprights, then 6-inch armour plates on 6-inch teak uprights, and finally an inner skin 1¼ inches thick. Both targets were bolted through with 4-inch and 2½-inch bolts, and both were supported at the ends by teak posts 12 inches square, backed by horizontal beams, and strutted with timber of the same scantling and kind. Both targets were supposed to represent, theoretically, an equal resisting power, and the experiment, in addition to determining the absolute amount of this resistance, was watched with much interest as another step towards the solution of a question of considerable importance, namely, whether a given thickness of armour-plating, made up of two plates, will, by judicious backing, offer the same resisting power as a single plate of the same thickness. As the difficulty of manufacture and the consequent cost of armour-plates increase with their thickness, as a matter of economy it will be of great advantage to be able to use an 8 and a 6-inch plate whenever 14 inches of iron are required, rather than a single plate of the same thickness.

The 25-ton gun was loaded with 85lb. of the new pebble powder, and a 600lb. Palliser solid shot, with chilled head and sand body,

was laid on Target No. 1. The shot struck the upper plate fairly, 19 inches high and 17 inches to the left of the central point of aim; and, after penetrating 13·95 inches into the plate, fell out in front of the target, the chilled part remaining intact, but the sand-chilled body breaking up into fragments. The laminations round the ripple mark showed the plate to be of excellent quality and of good manufacture. The second round from the same gun and with the same charge was fired at No. 2 target, and struck in the centre, between the two 8-inch plates. In this case the shot broke up completely, after effecting a penetration of 19 inches, through the outer 8-inch plate, through the six-inch upright teak back, and into the 6-inch plate, the other backing and inner skin remaining intact. The upper 8-inch plate, which received most of the effect of the blow, was driven back at the corners, and buckled upwards two inches from the lower one, starting the skin forming the top of the target. Behind, one large bolthead was torn off by the effect of the concussion, but not so many smaller ones as in the case of the other target.

Round three was made up of a 568lb. Palliser shell, containing a bursting charge of 14lb. The gun was laid on Target No. 1, and the shell struck the 14-inch lower plate near the bottom, and penetrating about 11½ or 12 inches, bursting and breaking up before doing any more damage. The blow arched the lower plate downwards in a way that would have been very likely to interfere with the revolution of a turret, and inclined the upper right hand edge to the front. In the rear many bolts were broken, and the timber supports were damaged.

The fourth and final round at the experimental targets was a similar charge of powder and shell at Target No. 2. It struck the lower edge of the bottom 8-inch plate, close by one of the 4-inch bolts, scooped a piece out, and then penetrated the ground, doing a good bit of damage to the rear of the target.

Royal National Life-boat Institution.—A meeting of this Institution was held on Thursday, 4th May, at its house, John Street, Adelphi, London—Mr. Thomas Chapman, F.R.S., V.P., in the chair. Rewards amounting to £73 were granted to the crews of life-boats for recent services on the occasion of shipwrecks on our coasts. The Banff life-boat went off to the aid of the brig *Trioner*, of Arendal, Norway, and saved the crew of nine men shortly before the vessel was wrecked. The Ramsgate, North Deal, and Kingsdown life-boats succeeded in extricating the brig *St. Thomas's Packet* and her crew from a very perilous position. The Seaton

Carew life-boat brought ashore two men belonging to the schooner *Cynthia*, of Montrose, which had gone on the North Gare Sands during a strong wind and sea. The silver medal of the Institution, a copy of its vote on vellum, and £1 were presented to Mr. William Taylor, of her Majesty's Coastguard at Dunny Cove Station, County Cork, together with £4 to his boat's crew of four men, in acknowledgment of their gallant conduct in saving the crew of eight men of the brigantine *Cecil*, of Liverpool, which, during a strong wind from the W.S.W., was wrecked in Rosscarberry Bay, County Cork. The silver medal, vote on vellum, and £2 were also voted to George M'Genis, late of the barque *Albany*, of London, in acknowledgment of his brave services when that vessel was lost on M'Carthy's Island, near Cape Clear, during stormy weather some time since. On that occasion M'Genis took a small line, and, watching his opportunity, jumped overboard and reached the shore, and by means of the line effected a communication with the land, and thus the nine persons on board the wreck were saved. Other rewards were also granted to the crews of shore boats for saving life from wrecks on our coasts. Payments amounting to £1,800 were also ordered to be made on different life-boat establishments. Various contributions were announced as having been received, notably £680 from Mrs. Eliza Foulston, to defray the entire cost of the new life-boat station about to be formed at Sunderland.

Royal Naval School, New Cross.—The annual general meeting of this school was held at the Royal United Service Institution, Whitehall-yard, on the 27th; Admiral the Hon. A. Duncombe, President, in the chair.

From the report which was read we are glad to know that this excellent Institution is reviving from the depressed state it has been in during the last few years, and we see no reason why, with proper management, it should not regain its lost ground, and become what it professes to be, viz., a school in which an officer can obtain a superior education for his son, at a minimum cost, and also one in which the more necessitous can obtain the same education for less than the cost, and that to a much greater extent than has yet been reached.

The throwing open the school to the sons of officers in the Army and the Civil Service, has been attended with happy effects, and we doubt not that many of the officers of the Royal Naval Reserve will avail themselves of the recent regulation, whereby their sons are admitted. It is gratifying to find that notwithstanding the large calls that have been made upon public benevolence for the relief of

the sufferers by the late war, and for the widows and orphans of those lost in the *Captain*, there has been no falling off in the receipts; at the same time, to enable the Institution to extend its usefulness and to meet its necessities, an increase in the number of subscribers is earnestly desired.

When the loss of the *Captain* became known, the council immediately resolved to admit five extra pupils on the nomination of the committee of the *Captain* Relief fund, without waiting for election by subscribers.

The summer vacation of the school commences on the 20th, on which day the prizes will be publicly distributed, and in our next number we hope to find space to record the names of the prize winners, etc., with a list of whom the Secretary has kindly promised to furnish us.

Designs for Ships of War.—The Committee of Designs for ships of war have come to an important conclusion in regard to the class of ships of which the *Devastation* and *Cyclops* are the type. The Committee are satisfied with the stability of the ships whether completed with the superstructure as designed by the Controller's department or not. Some modifications have been suggested but as they relate to internal fitment, they do not in any way affect the safety of the vessel.

The Committee were not unanimous in their conclusions, as two practical men, Admiral George Elliot and Rear-Admiral Ryder, concur in opinion that there are grave defects in the design, and suggest modifications of structure.

If the conclusions in regard to stability have been arrived at by means of experiments with a section as illustrated by the model exhibited by the master shipwright of Portsmouth at the late Soiree of the President of the Royal Society, and which we noticed in our May Number, we cannot but think that one serious effect on stability has been overlooked, and which must have exerted great leverage in the loss of the *Captain*, we allude to the effect of the wave rising against the side of the ship and travelling with great velocity, while the water in which the bottom of the ship is immersed is *in inertia*.

The Arctic expedition, under Captain C. F. Hall, to which we alluded in our last Number, is speedily to sail from Washington in the steamer *Polaris*, provided by the Navy Department of the United States Government. The vessel is strengthened to resist the pressure of ice, and in every way equipped for her perilous voyage. In addition to Dr. David Walker, Captain Hall is

accompanied by Dr. Emil Bessels who has had previous Arctic experience in a Spitzbergen expedition. Captain Hall, who expects to be absent about two years and a half, has been overwhelmed with applications from enthusiastic young gentlemen of wealth and culture, and even ladies of the same social position, desirous of accompanying the expedition, and little thinking of the hardships and dangers to be encountered. But he has prepared a picked, experienced crew. Two Esquimaux, Joe and his "cooney," or wife, Hannah, who have been with Captain Hall a number of years, and who have been partially civilised, and speak the English language intelligibly, go with the expedition, the former as the interpreter, and the latter in the capacity of tailoress. It has been long ago demonstrated that the woollen clothing of the white man is absolutely worthless to protect the Arctic traveller from the cold, piercing blasts to which he is exposed, and the costume of the Innuit or Esquimaux, consisting of the deer-skin, kooly-bang, a sack jumper with fur hood, the sealskin breeches, and deer, seal, and eider duck stockings, one over the other, and covered with stout mocassins of seal skin, with high leggings, has been adopted as the only articles of apparel that are impervious to the inclemencies of the fearful climate. The Esquimaux tailoress is therefore an important and really indispensable personage aboard the *Polaris*.

Sea Birds.—We rejoice to think that the wanton and wholesale destruction of the sea-birds of our coasts has been stopped. Two seemingly insignificant pieces of legislation have already borne good fruit. The Sea-birds Preservation Act and the Gun Tax have spread joy among the populous colonies of gulls, terns, puffins, and other useful screamers whose voices are often heard by sailors in thick weather shrieking out a friendly warning. No pale-faced cockney is now at liberty to "pot" these harmless and useful creatures, or to steal their eggs for no one knows what purpose. We are informed that in consequence of these prohibitions the numbers of birds have already largely increased about our cliffs and headlands, and we heartily congratulate the Association for the Protection of Sea-birds on the success of their efforts.

Exploration of the River Amazon.—We understand that a small iron steamer, drawing only thirty inches water, has been built for the purpose of exploring the upper waters of the Amazon, and great hopes are entertained that she will prove the pioneer in opening the great country drained by that river, to trade and commerce. The steamer is appropriately named the *Explorador*.

We have to record the death of Staff-Commander George F. McDougall, which took place, after a very short illness, on the 30th April. Captain McDougall was the compiler and editor of several valuable Sailing Directions, and had seen much service in the surveying department: he accompanied Admiral Austen in his expedition to the North Pole, and was author of "The eventful Voyage of the *Resolute*." This officer's loss will be much felt in the Hydrographic Office of the Admiralty, to which he was attached as a Naval Assistant to the Hydrographer.

BRITISH SHIPS IN AMERICAN WATERS.

[The following correspondence between the Board of Trade and Mr. Burns, respecting a convention with the United States for putting British shipping in American waters on the same footing as Foreign ships in British waters, so far as regards liability, has been printed by order of the House of Commons, and we reproduce it for the general information of our readers.]

No. 1.—*John Burns, Esq.*, to the Board of Trade.

Fenton's Hotel, London, 1st May, 1871.

Sir,—Referring to the conversation I had with you when I had the honour of an interview a few days ago, I now proceed to state in writing what I then brought before you on the subject of the liability of British shipowners when sued in the courts of law of foreign countries, for damages in respect of injury to vessels of those countries, or to goods or passengers conveyed in such vessels, or in the vessel of the British shipowner, or to another British vessel in foreign waters. I do so with some hesitation, but I trust that the large practical experience I have had of the risk, and I may add the hardship, arising from the position in which the British shipowner is placed by the difference in the law of our country and of foreign countries, may be held to excuse my venturing to express to you my opinion upon a subject which, from its importance in regard to international relations on the one hand, and to the well being of a very important branch of the enterprise of our own country on the other, is, I admit, not to be approached without very careful deliberation.

For obvious reasons I cannot, in this communication, refer to the details of cases in which I have been personally concerned; suffice

it to say, that, in more than one instance, I and my partners have been compelled to pay damages, or give security in court, to parties suing in foreign courts, to the extent of upwards of £50,000 in respect of a *single* accident, and that even those large amounts were not by any means the maximum of what we might have been made liable for had the loss occasioned been greater and our liability established; while, on the other hand, had we suffered the wrong, and been obliged to sue the owner of a foreign ship, under similar circumstances, in our British courts, the maximum which we could have recovered (whatever might have been the amount of loss inflicted upon us) would not have been a half of the sum before mentioned, even supposing the foreign vessel to be of equal tonnage to that of our vessels in the cases referred to; and, if the vessel were smaller, the amount to be recovered would be diminished proportionately.

I am not now complaining of *injustice* either in the laws of foreign nations or in the administration of their laws by their courts; but I maintain that the risk and hardship arising from the difference in our laws on this question and those of foreign nations is very great and that every legitimate effort should be made to induce foreign Governments to assimilate their laws to our own.

I think I may assume that, in the view of the Government of this country, it is undoubtedly for the advantage of commerce, and consequently for the advantage of the world in general, that the liability of the shipowner should be reasonably limited. The amount of loss involved in the destruction of a single vessel laden with valuable cargo, or carrying valuable lives, or both, is so tremendous, as to tend to discourage individuals from running the risk of incurring such a liability. Hence it has been adopted as the law of some of the greater maritime nations, that the liability of the shipowner, when he has *no* privity in the fault of his ship, or of the officers and crew thereof, should be limited to the value of his ship and the freight thereof. Were this the *universal* rule, it would be a step in advance, but it is not so, as will appear hereafter; and, even if it were, there is this defect in the rule, that it exposes the owner of a valuable ship to larger damages than he would have incurred if his vessel had been of a less valuable character, and thus holds out a premium to the employment of inferior vessels.

I am informed that by the *common* law of England the owner of a vessel would be liable to his last farthing in making good any damage done, by the fault of his vessel, to another vessel and its cargo. But as early as the year 1734 the British Legislature thought fit to limit the liability of the shipowner to the value of his

ship in fault, and the freight then accrued or accruing by her (see 7 Geo. 2, c. 15, 26 Geo. 3, c. 86, 53 Geo. 3, c. 159), and ultimately by "The Merchant Shipping Act, 1862," the liability of the British shipowner was limited in respect of loss of life or personal injury (alone or altogether, with damage to ships, goods, etc.) to £15, and for damage to ships, etc., alone to £8 for each ton of his ship's tonnage.

Previously to 1862 the *statutory* limitation upon the English common law, in respect to liability, extended to the owners of *British* ships only. It did not affect foreign shipowners whether the question arose between two foreigners or between a foreigner and a British subject. In any such case the British Court dealt with the parties on what was deemed to be International Maritime Law. That law was assumed to be the same as the English common law, and the liability of the party in fault was held to be unlimited. There was something anomalous in such a state of the law, but it secured equality between foreigners and British shipowners. In 1862, however, when the alteration above mentioned was made in our statute law, the limitation of liability previously established as between one British shipowner and another was extended to foreign ships, without reference to the differences which might exist between the law of the country to which such ship belonged and the British law. This alteration has been stated to have been made on the ground of establishing *a just and uniform rule*, which we should extend with impartiality to all nations; trusting, I presume, to the effect of a good example in leading others to adopt a like course.

It might be difficult to resist this reasoning if applied to some great fiscal operation; but I maintain that, in order to the fair application of the principle on which it rests, the whole community should bear the effects of its adoption, and not merely a few individuals engaged in a particular trade; as, although the rule may *ultimately* prevail from its intrinsic merit, still some time must elapse while it is asserting itself, during which these individuals may be made heavy sufferers, or rather martyrs, to the principle of extending to others advantages which they do not reciprocally extend to us. Had the British Government, in 1862, when they were remedying the defect in our own law, applied themselves to obtain a like remedy in foreign countries, and had they succeeded in securing it, they would have conferred a boon of the highest character on the shipping interests of this country, and, I believe, of the whole world.

An opportunity has arisen for urging upon one foreign Government, at any rate, the advisability of making their law conformable to our own. A convention is at present under consideration between

the United States and Great Britain in respect to the conveyance of passengers; and I would press upon the attention of our own Government the propriety of urging at the same time upon the Government of the United States a convention for the adoption of our rule of limited liability, both as benefiting their own marine, and as reciprocating the advantages given to their subjects by the law of this country.

If our law be a *just* one, and one which we have made *uniform* in its operation, as respects the British shipowner and the owner of a foreign vessel, it should need no further argument to prove that it must be a just one as respects the subject of the United States *inter se*, and one which should be extended by the United States to the shipowners of other countries; and I would hope that when properly explained, the merits of the rule we have adopted would recommend it to the favourable consideration of the Legislature of the United States. The care and attention exercised in fitting out British ships under the requirements of our law, and the selection of officers approved by the Board of Trade (after strict examination) as competent for their duties, might, however, also be urged upon the United States in favour of granting our shipowners the protection which our law already gives to the American subject.

I feel confident that when the mercantile marine of America recovers from the depression resulting from the civil contest in that country (an event which may be confidently expected soon to occur), the benefit to themselves as well as to us of a just and uniform rule would soon become manifest; and its adoption would tend to that harmony which is so desirable between the two greatest maritime nations.

I have through the kindness of your department, had the opportunity of perusing the opinion (dated 22nd January, 1867) of Mr. Carlisle, the legal adviser of the British Legation at Washington, as to the law of the United States on the subject of which I am speaking.

It appears from that opinion that the law, as administered by the Admiralty Courts of the United States, limits the liability of the shipowner, whether a subject or a foreigner, to the value of his ship and freight: but that it is open to any party aggrieved to bring his action, on the *case*, in the court of any *State* in which he may find the defendant (or, I presume, his property, in the shape of a ship or otherwise), and that by the law of such *State* the liability of the defendant would be *unlimited*. Without admitting that Mr. Carlisle is right on the *latter* point, I submit that the evil arising from the liability recognised by the Federal law is very great,

because as the American law gives a larger amount of redress than the British law, it is the interest of the American subject claiming damages to raise his action, whenever he has the opportunity, in an American court, and the British shipowner, whose vessel has by misfortune collided with an American vessel, must either avoid entering an American port, and take care to have no property in America, or subject himself to being sued in an American court, where he may be made liable to the full value of his ship and freight. But in many cases (my own and my partners, for example) it is impossible to avoid sending vessels into American ports, except by abandoning the trade altogether, and failing in contracts with our own Government. To be exposed to be sued and made liable for an amount equal to the value of *one* of the large steamers which now conduct the traffic between England and America is a frightful contingency; such a vessel and its freight running up in value to as much as from £120,000 to £150,000; but when it is considered that some of the British lines of steamers have vessels of the above description entering American ports weekly, it may be supposed that the unlimited damages recoverable (if Mr. Carlisle's opinion be sound as to the unlimited amount which might be adjudged in the State's courts above referred to) would become quite overwhelming.

It has been suggested to the British shipowner that the extension of the rule of limited liability in *our* courts to the ships of other nations is in itself advantageous to *him*, inasmuch as in the majority of cases *he* would be the defendant in our courts from whom the damages would be claimed. I am not prepared to admit that *we* must be in most cases the defendants; even if it were so, the same advantage would by the adoption of our rule, accrue to American shipowners in American courts.

But besides this, I maintain that the American law is disadvantageous even to the American shipowner who may have been so unfortunate as to be the party in fault in a collision with a British vessel, inasmuch as the *British* shipowner may, in an American court, recover so much larger an amount of damage than he could recover if the American law were made similar to the British law. That, however, is a privilege on the part of the British shipowner which I would willingly surrender for the sake of a just and uniform law.

I may put a case to show the anomalies arising under the present state of the laws of the two countries.

In the case of a collision between a British and an American vessel, when the *latter* is in fault, if the collision occurred on the

high seas, the plantiff could only recover in a *British* court damages limited to £8 or £15 (as the case might be) for each ton of the American vessel; *but* he might recover in the Admiralty Court of the United States damages limited only by the full value of the offending ship and her freight; *or* (if Mr. Carlisle be correct) he might recover in a "State" court of America damages limited only by the fortune of the owner of the offending ship. Here we have three different scales of compensation open to the same person for the same accident.

But it hardly requires any particular cases to show that there must be great hardship, and even injustice from want of uniformity in laws affecting the same persons in respect to the same circumstances, though in different courts. It could not be tolerated that there should be a difference of liability in England and Ireland, and I cannot doubt that the Legislature of the United Kingdom would at once remove the difference if it existed; but the maritime relations between America and England are nearly as intimate as, and much more extensive than those between Ireland and England, and I therefore submit that what our Government would undoubtedly do by Act of Parliament in this country, where they have the power so to do, they should endeavour to do by negociation with the American Government.

It appears from Mr. Carlisle's opinion, that by a convention between Great Britain and the United States, with a proper Act of Congress to carry it into effect, the measure of damages may be limited not only in a Federal court, but also in the several "State" courts of America, and it seems to me that it cannot but be the duty of our Government to endeavour as quickly as possible, and to the utmost of their power, to obtain such a result.

I would also press upon our own Government, the propriety of taking the earliest opportunity of obtaining an assimilation of the law of other foreign countries to our own law, on the subject of shipowner's liability.

So far, I have found it impossible to ascertain with certainty what is the law of some of the leading continental nations, and it may be supposed how embarrassing to the shipowner is such a state of matters. The adoption of a just and uniform rule by all, would be an incalculable benefit. No doubt there are difficulties in the way of obtaining it, but I feel assured that the adhesion of one great State would pave the way to that of another, and that if two or three such States adopted the same rule it would soon become universal international law.

I have not commented above upon the benefit which the adoption

of our rule of limited liability would confer upon the American shipowner in cases of collision with vessels of his *own* country in American waters, as I felt I might be intruding upon ground peculiar to the subjects of another government; but considering the extensive coasting trade necessary to connect the various ports on the Atlantic and Pacific sea-boards of that great country, and the constant danger to which the American shipowner must be exposed, of being made liable for accidents quite beyond his control, I should think it well worthy his serious attention and best efforts to secure the enactment of a law which would reasonably secure him from the overwhelming risks which he is now compelled to incur.

I must apologise for the length to which my observations have extended. I can only ask your kind consideration on account of the vast importance of the subject to which I refer.

I am, etc.,

To the Right Honourable (Signed) JOHN BURNS.
the President of the Board of Trade.

No. 2.—Board of Trade to *John Burns, Esq.*

Board of Trade, Whitehall, 8th May, 1871.

SIR,—I am directed by the Board of Trade to acknowledge the receipt of your letter of the 1st May on the subject of the liability of shipowners in the courts of foreign countries, and especially in those of the United States. The Board have read your letter with great interest; and the more so, since the subject is one which has long engaged their attention. It is now nearly three years since Her Majesty's Government urged upon the United States Government the expediency of making an alteration in their law, and the Board of Trade have recently been in communication with the Foreign Office for the purpose of again pressing the question on that Government.

As regards the statements and views contained in your letter, the Board of Trade for the most part entirely concur with you: there are, however, some parts of which appear to them to be calculated to convey erroneous impressions, and these impressions are such as it is very important to correct. From certain passages in your letter, it might be supposed that under the operation of the United States law British shipowners are exposed to liabilities to which United States shipowners are not subject; that prior to 1862 the laws in force in this country placed the British shipowner and the foreign shipowner on a footing of equality as regards liability; that the changes made in British law by the Act of 1862 did away

with this equality, and gave some special advantage to the foreigner; that by so doing an opportunity was lost of making terms with foreign nations for obtaining from them similar advantages for British ships; and that Her Majesty's Government have now the difficult task of asking foreign governments to give these advantages to British ships without having any consideration to give to them in return. These implications are, it is true, at variance with other passages in your letter, and it is possible that they do not completely or exactly express your meaning; but however this may be, the Board of Trade think it important that there should be no misapprehensions on the subject for various reasons, but especially because any such misapprehensions are calculated to place difficulties in the way of obtaining from Foreign Governments the alterations in their law which Her Majesty's Government agree with you in thinking desirable.

The actual state of the case is as follows:

By the common law of this country, and by the maritime law as administered in the British Admiralty Courts, the shipowner was formerly liable to the whole extent of his fortune for any damage done by his ship to another ship or her cargo through default of his servants.

The legislature, however, as you have pointed out, long since passed statutes limiting this liability; but it was held that these statutes, being municipal laws, did not affect cases where foreign ships were involved, but that such cases must be governed by the general maritime law of the world, which was at the time, whether correctly or not, assumed to be the same as the British common law.

The consequence was, that if a collision occurred between two British ships, the British law of liability applied, and the liability on either side was limited; but that if a collision occurred between a British and a foreign ship, or between two foreign ships on the high seas, and the case was tried in a British court, the liability was unlimited on the part of the ship adjudged to be in fault, whatever her nationality.

This state of the law was, of course, anomalous, but in no way specially injurious to the foreign as compared with the British shipowner, or to the British as compared with the foreigh shipowner; the liability of the ship in fault, whether British or foreign, was equally unlimited. The law was hard upon the ship in fault in such cases, but it was equally so upon all ships in fault, whatever their nationality.

Under these circumstances, and with the view of enabling British courts to administer the same law in all cases, the British statute

was amended by the Merchant Shipping Act of 1862, under which the principle of limited liability is applied to all cases coming before British courts, whether the ships concerned are both British, or both Foreign, or one British and one Foreign.

This change was simply an improvement of British law. It extended the principle of limitation of liability to all cases without distinction of nationality, but it conferred no special advantage on Foreign as distinguished from British ships. If the Foreign ship is the defendant, and in fault, the Foreigner gains an advantage by it; but if, as is perhaps more usually the case in suits in this country, the British ship is the defendant and in fault, the British shipowner gains an advantage by it. Under such circumstances, since the measure was just as advantageous to British as to Foreign interests, and conferred no special advantage upon Foreigners, it was not thought desirable to delay it in order to make it the means of obtaining similar changes in the laws of Foreign nations.

This is the state of the case as regards British law; as regards the laws of the United States, it is not quite clear what they are.

The only Act of Congress which refers to this question is that of the 3rd March, 1851. This Act, sect. 3, is as follows:

"And it be further enacted, that the liability of the owner or owners of any ship or vessel for," etc., etc., etc., "*for any loss, damage, or injury by collision*, or for," etc., etc., etc., "shall in no case exceed the amount or value of the interest of such owner or owners respectively in such ship or vessel, and her freight then pending." (Statutes at Large, chap. XLIII. p. 635.)

It would at first sight appear from the wording of this Act that the liability of the owners of *all* vessels, *whether native or Foreign*, are limited in cases of injury by collision, tried before the United States Courts, to the amount of their interest in the vessel and her freight. But upon the best consideration the Board of Trade can give, they believe it to be probable that the Courts of the United States would put upon the Act of Congress above quoted a construction similar to that which before 1862 the English Courts placed upon the British Statutes, and would hold that the limitation of liability conferred by the Act of congress does not apply to a British ship which has done injury on the High Seas to an United States ship, or to an United States ship which has done injury on the High Seas to a British ship.

It further appears to be doubtful, as is well pointed out in your letter, whether the laws of the several States do not give an action on the case for damages to an unlimited amount against any shipowner, of whatever nationality, whose ship may do damage to another ship.

Assuming this to be the state of the American law, the Board of Trade entirely agree with you that it is desirable that it should be altered, but they do not think that it is more injurious to the British than to the United States shipowner. It is quite true, as you state, that it is the interest of an American subject claiming damages to raise his action in an American court; and that the defendant, if a British shipowner, may be held liable in that court to the full value of his ship and freight, or possibly to the full value of any property he owns in the United States. But it is equally within the power of the British shipowner, if he sustains injury, to bring his action in the American courts; and then he will recover from the American shipowner the large amount of damages which the American courts award. It is the plaintiff who has an advantage in the American courts, whatever his nationality; and if any given shipowner specially suffers by it, it is not because he is English, but because he has the misfortune to occupy the position of the defendant who has done an injury. It is obvious also that in this state of things those who reside in America and have property there, are in that respect, and to that extent, at a disadvantage; since all their property can be seized by the American courts. And it is not a little curious that complaints have been made of the British law of 1862 by an agent for foreign ships, on the ground that that law limits the liability of shipowners still more than the laws of most foreign nations do; and that British shipowners, being frequently defendants in British courts, get an undue advantage from it.

The Board of Trade have thought it right to make these observations in order to show, in the first place, that the British statute of 1862 conferred no special advantages on foreign ships as compared with British ships; and, secondly, that the existing American law imposes no disadvantage on British shipowners as compared with citizens of the United States. But they agree entirely with you that, measured by our own law of 1862, the American law does inflict considerable hardship on the defendant who is in fault, whether he is a British subject or an United States citizen; and her Majesty's Government have, as above stated, urged on the United States Government the expediency of adopting a change in their law similar to that made in this country in 1862. They do not, however, for the reasons above stated, think that this is a matter of bargain with the United States; and on this account, and also because it is foreign to the narrower subject of emigration, they do not think it desirable to insert any stipulation on this subject in the draft Emigration Convention which is about to be submitted to the United States Government. They also think that

it would embarrass the subject, and probably lead to delay, were they to endeavour to obtain from the United States and other foreign governments precisely the same limit of liability which prevails in this country. What they have asked for, and what they will continue to ask for, is, that the United States should adopt some reasonable limit of liability, and should apply it to all ships, of whatever nationality.

I am, etc.,

(Signed) T. H. FARRER.

John Burns, Esq., Fenton's Hotel.

TONNAGE ADMEASUREMENT.

[We also reprint for our readers' information the following Letter (and its enclosure) from the Board of Trade to the Board of Customs, authorising the exemption from Tonnage Admeasurement of certain Spaces under a Spar-deck in vessels not using the same for Passengers, Stores, or Cargo.]

LETTER from the Board of Trade to the Board of Customs.

Board of Trade, Whitehall Gardens,
4th March, 1871.

SIR,—I am directed by the Board of Trade to inform you that representations have been made to them by Messrs. Burns and McIver, Messrs. Handyside and Henderson, and Messrs. James and Alexander Allan, of Liverpool and Glasgow, to the effect that certain spaces immediately below the uppermost deck of some of their ships cannot be used for the berthing or accommodation of crew or passengers, nor for the carriage of cargo and stores.

These gentlemen have also represented that these and other spaces below the uppermost deck have hitherto been exempted from admeasurement.

Looking to the fact that exemptions have been allowed, and bearing in mind the allegation of the owners, an allegation there appears to be no ground for disputing, that they have been led to believe that the above-mentioned exemptions would be allowed, and that this belief has led to the construction of vessels of a particular build and description; the Board of Trade are of opinion that in the case of steamers belonging to the firms named, of which the building commenced before the 1st instant, and in which exemptions have been allowed of spaces under the uppermost deck,

certain of these allowances shall be continued, subject to the conditions contained in the enclosed Memorandum which, as will be seen, expressly asserts the principle that all spaces under deck are subject to admeasurement.

With this object, the Board of Trade would, if the Commissioners of Customs see no objection, propose the following arrangement, viz.:

The ships in question will all be re-measured, and in each case in which exemption is claimed, it will be for the owners to furnish an accurate plan of the spaces below the uppermost deck, showing the parts for which they claim exemption, and on what grounds. The Board of Trade will, on receiving this plan from the Board of Customs, direct one of their surveyors to inspect the ship, and will afterwards inform the Board of Customs of their opinion, and of the deductions to be allowed.

I am, etc.,

(Signed) THOMAS GRAY.

The Secretary, Board of Customs.

(M. 2103.) ENCLOSURE.

Memorandum of Notes agreed to by *Messrs. J. and A. Allan*, *Messrs. Handyside and Henderson*, and *Messrs. D. and C. McIver*, as to Measurement of Transatlantic Steamers built before 1st March, 1871.

Every ship of which the building commenced before 1st March, 1871, to be measured according to the view of the Board of Trade, and registered accordingly. Every ship in which the measurement has been erroneous must be re-measured.

In doing so, all spaces under decks must be included in the first instance.

If in any case it can be shown that in a ship of which the building commenced before the 1st March, 1871, any spaces between the uppermost deck and the deck immediately below it cannot be used for the berthing and accommodation of crew or passengers, and are not constructed and are not intended or suitable for the carriage of stores or cargo, and have not been and are not likely to be used for stores or cargo, then, on a special certificate to that effect from an officer appointed for the purpose by the Board of Trade, the tonnage of such spaces may be excluded from the measurement so long as such spaces correspond to the foregoing description.

If any dock company or other person object to the deduction, the responsibility to rest with the owner.

THE

NAUTICAL MAGAZINE.

NEW SERIES.

JULY, 1871.

MANNING THE NAVY.

Two remarkable papers have lately appeared in the periodicals of the day, one the now well known Battle of Dorking, which originally appeared in *Blackwood's Magazine*, the other a translation from the *Allgemeine Zeitung* of an "Open address from the German-English politician of the future, John Michel Trutz Baumwell, to his Majesty the German Emperor," which appeared in the *Standard* during this month; the former, although possessing no great literary merit, has commercially been a great hit, and notwithstanding the improbabilities, nay, we had almost said, absurdities, that are apparent on the face of it, it is a timely reminder that like Achilles we may wrap ourselves up in the invulnerability of our own armour, and yet have one spot unguarded which may negative or render worthless all our care, and, should the publication have the effect of directing the attention of the great public to our (in part) defenceless condition, its value will not be measured by its literary merits, but rather by the benefit conferred on the nation in pointing out the country's weakness.

Of John Michel Trutz Baumwell's effusion, it may be aptly termed a political squib, still, notwithstanding its personal attacks on the "powers that be," there is an under current of caustic humour, that may be read with profit by an Englishman of whatever party of politics he claims to be an adherent.

Irrespective of party feelings, we regard these brochures as timely and valuable. There is no doubt much to be called in question as regards the present state of things. Without taking upon

ourselves the *rôle* of the numerous terrified alarmists who, during the late war, have had so much to say about our own wretched condition, we would regard the matter for a moment in a purely practical and truly English style. As regards our commercial position, are we fully insured? Is all the wealth of this great country in such a state of security that taking into consideration the altered conditions of national armaments, and consequently the mode and character of warfare, and also the short time in which whole kingdoms are revolutionized, annihilated, or created, can we rest and be content with things as they are? We think not.

It is on all hands acknowledged that our present means of manning the navy in case of emergency, are by no means satisfactory.

In our March number we published an article on British Ships and British Seamen, wherein the question of utilising the seamen of the Merchant Service as a reserve for the Royal Navy was treated upon at some length. Curiously enough, since the publication of that paper the subject seems to have been discussed to a considerable extent. Pamphlets, lectures, parliamentary debates, and leading articles, have all taken up the question, and by throwing a good deal of light upon it, have done a vast amount of good.

The debate in the House of Commons on Mr. Graves' motion was exceedingly useful and instructive. The honourable gentleman shewed that things were not at present in a satisfactory state,—that although our resources were unrivalled, yet nevertheless in case of sudden war we should experience great difficulty in obtaining sufficient men for manning our ships of war, and he pointed out various causes — notably the isolation of the Royal Navy from the other naval services of the country— which brought about the state of things he deprecated. Mr. Goschen, who could hardly be expected to be sufficiently well up in the subject to consent to take immediate action, defended the efficiency of the Navy as it is, admitted that the Naval Reserves were unsatisfactory, and promised that the whole subject should have the attention of the Admiralty, and be considered in the broadest manner. So far so good we say. We look forward with considerable interest and some little anxiety to Mr. Goschen's remedial measures next session. In addition to this debate, as we have said, numerous articles have appeared in our daily, weekly, and monthly contemporaries on the subject, a specially valuable paper contributed by Mr. Robert Main to "Colburn's United Service Magazine" being among them. Captain Gardiner, R.N., at the

Royal United Service Institution, has read a paper, on "The Formation of Naval Reserves," and advocated the utilisation of the merchant seamen to a large extent, and of boys from training ships. Besides these, sundry pamphlets have been published more or less bearing out the general idea of utilising the Mercantile Marine as a Naval Reserve, but alluding to defects in the present system.

While referring to the recent discussion we would offer a few remarks and suggestions upon the general subject of our Naval resources.

The tone of the discussion seems to point to the necessity for drawing together in much closer relationship than hitherto, the sailors of the Royal Navy and those of the Mercantile Marine. A more intimate association of the two services is undoubtedly what is required to place the profession of a sailor on a more satisfactory footing. Sailors are sailors, be they of the Royal Navy or the Merchant Service; the profession is a noble one in either case, and we believe this is thoroughly appreciated by the best seamen; but unfortunately sundry causes have operated to divide them into two classes, and there is now a great gulf between them so that they who would pass from one side to the other cannot, at least not without considerable difficulty.

It is unnecessary for us to dilate at length upon the causes that have brought about this state of things; our readers probably are fully aware of them, as they are also of the fact of the division. No sudden or violent legislation will succeed in making things different, but at the same time, to maintain the efficiency of our navy, we consider that administrative efforts should be directed to equalising as much as possible, the conditions of service of naval men and merchant men. It is true that certain duties are required to be performed by seamen in the navy, of which mercantile sailors have no experience, and vice versâ, but the essentials of a sailor's education are the same in both cases.

It may be said, "this is all very fine in theory, but it is vague and unpractical; shew us how to remedy the existing state of things." We acknowledge the difficulty. On reference to the recent discussion, we everywhere find the same idea which animated the organizers of the Royal Naval Reserve in 1859, that merchant seamen should be encouraged to take part in the military element of our marine. This, we consider, is a great step towards adjusting the differences which exist among our sailors, the glory and honour part of the business, if we may so term it, not being entirely monopolised by the navy men. We, however, would be inclined to go further

than this, and propose that if possible the interchange should be mutual. In time of war fighting sailors are required, in time of peace merchant sailors are wanted, and it seems to us that every inducement should be held out to seamen to render themselves available for either service. But unfortunately the present condition of things places many difficulties in the way. In war time it would seem an easy matter to arrange that the unemployed merchant sailors should join the fighting service as a matter of course. But the men must, to be of any use, be drilled and in some measure be accustomed to the restraint and discipline of a man-of-war; the number of men obtainable is of course a great consideration, but the quality and character of the men is scarcely secondary, and the difficulty lies in offering an inducement such as will enable the State to retain a man's services in case of need, and at the same time not do injustice to the regular servants of the Crown. Even now Jack of the Royal Navy mutters over the better pay and advantages given to the Naval Reserve man for his one month's training in learning his duties; and where those inducements fail to raise the requisite number of men further inducements would be necessary, and would only tend to make the seamen of the Royal Navy more dissatisfied.

Another great difficulty to be overcome before any true amalgamation can be effected between the two services is that of prejudice, and it must not be imagined that this prejudice exists on one side only, if anything it is greater on the part of the Merchant Seamen against serving in the Royal Navy than contrariwise, and we know that the natural prejudice is at times encouraged. Say a seaman of a merchant ship is inclined to volunteer for a man-of-war, he is reminded of the "cat," the martial law, the strict discipline, the drill, the polishing, the cleanliness, the many masters he has to obey, but is never told that his own captain has more real power over his person and his pay than any captain in the Royal Navy could have; it is but natural the merchant captain should wish to keep his best men, and if he can do so by pointing out the disadvantages of serving in the Royal Navy his object is gained.

On the other hand the man-of-war's-man has in nine cases out of ten been brought up to the mode and style of work from his youth, and has gradually become accustomed to the order, cleanliness, and discipline in the atmosphere of which he lives that it becomes a second nature to him, and he has no taste for the different state of things on the merchant ship, and although the temptation of the higher pay does sometimes cause a man on the completion of his time to transfer his services, it is not from the love of the merchant ship, but rather to make money.

We do not attempt to say that as seamen there is any difference between the two classes of men of which we speak, no finer seamen exist in the world than in our coal trade or whalers, but no man-of-war's-man would ever consent to bear the hardships and privations many of them have to go through, and on the other hand the colliers and whalers would never consent to the regularity and discipline of the men-of-war. As before remarked the essentials are the same, still the men are distinct.

The main point seems to be that the State requires the services of a large body of seamen in case of war, but does not want their continuous service in time of peace. There is no lack of seamen in England to be utilized, and it seems strange that things cannot be so arranged that our whole commercial marine should not be available for protection as well as for commerce. We recognise the establishment of the Royal Naval Reserve as a judicious step in the direction indicated by us. Experience will show the faults of the present system, and thoughtful and energetic men like Mr. Graves will not fail to draw public attention to the defects, and to use their personal influence towards remedying them. It cannot be said that the Reserve is yet a great success, although it is very far from being a failure; but it certainly has not turned out so well as was anticipated. We think that more freedom should be introduced into the working of the scheme, that many of the restrictions which now operate prejudicially against its success should be abolished, and that every effort should be made to smooth the way for seamen to join.

But we are of opinion that the most effectual plan for bringing the two services together for the purpose of the defence of our country, would be to begin at the other end and instead of commencing with men, to begin with boys. The law of the land says that every child shall be educated; let us commence with that education by an increased number of training ships, (that is to say after filling up the gaps that exist in the present vessels), the State supplying the ships and a certain amount of aid on certain conditions, and those conditions to include drill, gun and small arm exercise, in fact such as the boys receive in our own training brigs; this learnt it will never be entirely forgotten. This State help to boys would raise no feeling of dissatisfaction in the man-of-war's-man, and these boys would make none the worse men for the merchant service from their education and drill. If it were understood that for three or five years between certain ages these boys would be on the roster to be called on for service, with certain times for going through their drill, as with the militia, we believe that in a few years we

should have a large available force to fall back on in the event of war. Again, our fishermen are as much, if not more, interested in the defence of our coasts than any other labouring men, they should also be utilized for coast defence, manning our gunboats, floating batteries, etc. We believe it is a generally received axiom, that every man is bound to do something for the support of the State, and if one cannot give personal service the State lays an embargo on his pocket, his earnings are taken from him for the purpose; is it then too hard to suppose that where a man has not the money, he should give personal service?

Our merchant seamen should be encouraged and every restriction possible put upon the employment of foreign seamen; our fisheries also should be well looked after and the youth trained to serve their country in time of need.

It is to be hoped that there are not many among us who would like England to maintain a great standing Navy for the sake of her *prestige*, or glory, or any other name by which such national folly might be designated. We have seen what became of the French nation, who pursued the will-o'-the-wisp till they came to utter grief. Let us be wise and prudent in our national dealings; let us extend our empire and our power by our commerce and friendly communications with other countries,—and if unfortunately called upon at any time to defend ourselves from the attack of an enemy, let us be ready with the whole weight of our mighty naval resources to sweep our enemy off the seas.

MERCHANT SHIPPING LEGISLATION.—V.

CRIMPING.

(Continued from page 386.*)*

We will now imagine that the seaman referred to in our article of last month has made a voyage and has arrived at Callao. Here again he will find the crimp in existence and anxiously waiting for him. The following is an actual case in point:

On the night of the 17th July, 18—, two seamen pulled alongside one of Her Majesty's ships stationed at Callao, and begged for protection: they said they belonged to the British ship *Queen of the South*, in which they had served for many months and had a large

amount of wages due to them; two nights previously an armed party had come on board the ship, secured the chief officer and boatswain in their cabins, and then driven the crew into two boats. Surprised and taken in detail they appear to have offered no resistance, although they were sixteen or eighteen in number; they were taken first to a hulk and then to a lodging house where they were locked up and guarded by an armed man, plenty of grog being supplied to them; these two men had contrived to escape through a trap hatch in the room in which they were confined, and dropping into the sea, had swum to the boat in which they pulled off to Her Majesty's ship.

The next morning they were taken to the Consulate, and the captain of the port promised assistance.

The master-at-arms of Her Majesty's ship referred to, went with the party to the house where the sailors had been confined, and from his description it appears that the place of confinement was below the flooring and overhanging the sea (the house being built out upon piles); the room was fitted up with bunks, three or four tiers deep, was able to contain at least one hundred men, and the hatch in the floor afforded ample means for lowering men into boats. A part of the clothing of the men who had escaped was found; none of the kidnapped crew were in the house, but two of them who took refuge in the boats of one of Her Majesty's ships at the Mole said that when the crimps discovered the escape of the first two men, liquor was given to the remainder who were then carried out of the town; they however refused the liquor and escaped in the confusion.

During the stay at Callao of one of Her Majesty's ships in October and November, 1867, the ship's company were so confirmed in the belief that hocussing and kidnapping were carried on whenever the crimps had an opportunity, that the crew of the captain's galley would not leave the boat while waiting for the captain at the Mole, and most of the men declined to go on shore when the leave was granted.

Some however were lost, and the officers of the ship are certain they never thought of deserting; there was a case of one man who put a bundle of things he had purchased into the boat that was to take him off to the ship, and ran up into the town, as he said, for a minute to get a glass of grog, but a trace of him could never be discovered afterwards.

Certain respectable British shipmasters trading to Callao, finding the evil of crimping to be increasing and that no adequate steps were taken by the Local Authorities, convened a meeting on the

31st October, 1867, and their report which is as follows, explains in very moderate terms the state of the case.

These British shipmasters met to enquire into

First,—the causes of the prevalent desertion from ships in this harbour.

Second,—the effect which desertion and the knowledge that there is such facility for it, has upon the discipline and welfare of the crews of ships bound to this port.

Third,—the remedies best calculated to check desertion.

On the first point the meeting was of opinion that the prevalent desertion has its origin, and is chiefly caused by the system of crimping, which is carried on to an unusual extent in the port.

On the arrival of a merchant ship, a set of men called "runners" immediately go alongside in their boats, and endeavour under some pretence to get on board; should this be successfully resisted they hover round the ship, and watch for an opportunity to communicate with the crew and entice them to desert; the most extravagant statements are made to the men of the high rate of wages, the choice of any ship they like is offered, and the enjoyments to be had if they will only come on shore for a few days are dilated upon; liquor is smuggled on board, and even the best men are sometimes enticed away by the falsehoods that they hear; as a rule however, the seaman feels no moral obligation in keeping his engagements; he is influenced by his love of change, and by his dislike to the hard work of discharging a cargo, and of afterwards loading with guano, little or no wages are due to him and he falls an easy prey to the crimps.

The desertion appears to be generally effected by means of a "runners'" boat at night, the men are taken on shore, and from that moment they become the absolute slaves of the crimp; they are drugged, sometimes illtreated, and kept concealed in some vile hole until arrangements are made to ship them off, the articles are signed before the Consul, but the men are generally put on board at night insensible, and sometimes the crimp even substitutes others for those who were officially entered.

In all cases the three months' advance has been paid to the crimp, and the man arrives in England almost penniless.

On the second point, the meeting was of opinion that in some ships the discipline of the crew is not affected by the prospect of the opportunities of desertion, but in others the case is very much the reverse; a sailor once flogged for misconduct, makes up his mind to desert as soon as he reaches Callao. He then looks upon himself as working his passage, does as little as possible, grumbles at

any extra work, and finally, at a time when his services can ill be spared, refuses to work. In such cases the official log book, which is intended to promote order, is next to worthless, and the officers have the utmost difficulty in repressing the insubordination.

On the third point, the meeting was of opinion that remedies may be found for these desertions—

(1) By the reduction of advance, on shipping men at Callao, from three months to one month. This would at once take away all inducement to crimping, as the profit could not then repay the trouble and risk. Such a measure, however, would necessitate a general agreement amongst shipowners, and perfect good faith on the part of all captains in adhering to the agreement. At present no captain could incur the responsibility of delaying his ship to establish this point.

(2) By the authorities at the port of Callao strictly enforcing their own excellent regulation that shore boats are not to pull about the harbour after 8 p.m. without a permit.

(3) By the licensing and supervision of the lodging houses.

(4) A British ship of war can afford material assistance by boarding all English ships entering the port, and warning the captains and crews of the iniquitous conduct of the crimps; by aiding to keep off shore boats that hover round the ship; by rowing guard amongst the merchant ships at night, and taking to the captain of the port any shore boat that may be found without a permit.

The signals established for making known their need of assistance are, by day, the ensign at the main royal mast head; by night, a blue light on the poop.

A letter having been addressed to Admiral Hastings, in May last, by the captains of certain British merchant ships at Callao, expressing an opinion that as deserters must necessarily leave their ships without discharges, the offence would be checked by a greater strictness at the Consular Office in examining these documents, many of which are known to be forged,—this subject was taken into consideration, and the meeting considered greater stringency would be beneficial; but they also considered it would be advisable that the shipment of a sailor without a certificate should be left to the discretion of the captain.

A suggestion was also made that if the men were allowed to sign articles making their discharge optional at foreign ports, the dependence of the sailor upon the crimp would no longer exist, and desertions would cease. The meeting was of opinion that such a course is at present illegal; but even if legal it would only result

in the benefit of the crimp, who would gain by the wages earned on the passage out, as well as by the three months' advance which he at present receives; the ships would suffer great inconvenience, whole crews would demand their discharge, and labour, at a heavy expense, would have to be hired to unload the cargoes. It is right, however, to remark that the meeting were not unanimous upon the consequences of carrying out this suggestion.

The following is an Extract from a Despatch from Her Majesty's Acting Consul at Callao, dated May 2nd, 1868, which has been circulated by the Board of Trade.

"Unfortunately the masters of ships are very negligent in reporting the desertions of their men, otherwise many more might be apprehended before the ship leaves, and the crimps punished, if it be proved the men have been enticed from their duty.

"Generally speaking the masters of British ships do not report the desertions that take place during their stay in port until they are ready for sea, when they come to the Consulate for their papers, and produce their log book, at the same time shipping other men to replace those who may have deserted, but without having preferred a complaint at the time the men left the ship.

"This is done, sometimes from interested motives, the wages of the deserters, if any be owing to them, falling to the ship; also with a view of avoiding the expense of taking the men to the Chincha Islands, when the ship is destined to load guano, as they generally ship a certain number of natives before leaving this port for the purpose, being sure, on their return, of finding sufficient able seamen for the homeward voyage.

"This negligence or wilful neglect on the part of the masters in not reporting the desertions that take place at the time, consequently leaving the men behind, is, I think, the cause of many men being lost to the service of their country, engaging as they do in the coasting trade, or in the Peruvian service (a gratification of seventeen dollars being offered to them for the latter), or in trading ships of other nations."

The following case illustrates the ordinary run of cases in which masters neglect to take proper steps to recover deserters. Three of the crew of the *Royal Oak*, of Liverpool, signed an agreement on the 1st October, 1868, having deserted from the *Minnchaha*, of Liverpool, on the 29th September. They were not reported as deserters from the latter ship until after the former ship had cleared out for sea.

It has been asserted more than once, that there is no real co-operation on the part of the masters of British ships, generally speaking,

to check desertion; on the contrary, it is alleged that they seem indifferent to it, and even too frequently connive at it. That this is not always the case is proved by the energetic protests of some masters, and by the report of British shipmasters to which we have referred above; but that it is far too often the case, there can unfortunately be but little reason to doubt.

We have in the above remarks been referring to proceedings at Callao as lately as 1867 and 1868. It is satisfactory to find that since then matters have somewhat improved there, although crimping to a great extent still exists at Callao. Its origin may be traced to the guano trade, and its existence will be conterminous with want of system on the part of the port authorities; and with other evils and legislative defects which we shall specially refer to further on. It is not a native disease, but was started at Callao by foreigners. Ships arriving at Callao for the purpose of loading guano, can obtain native men on less wages than the wages of the original crews; with these natives they perform the voyage to the Guano Islands and back. These native men are, of course, better suited both for the work and the climate, and when they are paid off they give no further trouble to the British shipmaster. The ships want men to take them home, and it is here that the services of the crimp come into play. The profit to all concerned in the transaction of crimping is large—in fact, enormous—excepting only to the seaman. It is difficult to get trustworthy information about crimping at Callao, so numerous are the people mixed up, directly or indirectly, with the system—(in this respect, until recently, Cardiff and Callao were much alike); and it is only in such rare cases as those in which the officers of Her Majesty's ships or the Consular officer may take very unusual and vigorous action, as in the instance we have given above, that glimpses of the inner workings of the crimping system are brought to light.

So lately as April, 1870, a boy from a British ship applied at the Consulate, accompanied by a noted crimp, to ship, with three months' advance (£13 10s.); and it came out, from inquiries made by the Consul, that he left his last ship the day before. The Consul took vigorous measures, and had him conveyed under guard to his own ship. The boarding master was asked for his bill, but declined to make any charge, seeing that the boy had boarded for so short a time. In this case there is nothing to show that the master of the ship from which the boy had deserted had taken any steps to get him back. The forfeited wages, if any, would go to the ship; the boy by deserting might absolutely do

himself harm in a pecuniary point of view, but his re-employment on a British ship would be to the crimp worth just the sum that could be obtained as an advance.

Flagrant "man-stealing" at Callao is falling off; and though we cannot say that a trade in seamen is not still carried on between crimps and masters, we can say that the more virulent form is past.

(To be continued.)

JAMES KENNEDY.

A Tale of the War Time.

By JAMES B. KENNEDY, Lieutenant, R.N.R.

In Eight Chapters.

Chapter VII.

My father next served for a short time in the *Drake* sloop of war, and in 1806 joined the *Arethusa*, Captain (afterwards Sir Charles) Brisbane, and was in that ship at the capture of Curaçoa.

An attempt had been made two years before to obtain possession of the island by means of an ill-planned expedition, consisting of three line of battle ships, two frigates and a ten-gun schooner, sent by the Admiral, Sir John Duckworth, for the purpose. As the authorities declined to surrender the town and forts, Captain Bligh, acting according to his instructions, landed a force of about six hundred men at a cove not far from the entrance of St. Ann's harbour. After being on shore three weeks, during which time they suffered greatly from sickness and dysentery, they were obliged to re-embark, having lost in action twenty killed and twice that number wounded, and were obliged to leave all the guns they had landed, behind. This deplorable defeat (for it can be called nothing else) makes the capture of the island by Captain Brisbane the more remarkable.

My father's notes state, that the *Arethusa* and the *Anson* were sent by the admiral to reconnoitre Curaçoa; and to ascertain whether a squadron of French ships of war that had lately arrived in the West Indies, were in the harbour, and that if they fell in with any English frigates on the way, Captain Brisbane was to take them under his orders.

They fell in with the *Fisgard* and the *Latona*, called them in, and

all four frigates proceeded to a rendezvous about fifty miles east of Curaçoa: there they remained exercising day and night, particularly with cutlass and small arms.

The crews at first thought that they were *blacklisted;* for no one knew what they were going to do.

Captain Brisbane one day called my father (who was boatswain), and enquired what quantity of new canvas he had in store, and being informed, sent for some and had a cap cut out, something like an inverted fire bucket, or perhaps a Parsee's long cap. After deciding on the shape of one, he ordered one to be made for himself and for every officer and man in the ship. As soon as made, they were painted yellow, and the words,

painted on the front of each. Several of the officers ornamented their caps with bullion lace, etc.

My father knew, that whatever they were going to do, that both he and Captain Brisbane were sure to be in the thick of it, so he made the armourer take the bottoms out of a couple of copper lanterns, beat them out hollow for the shape of the head, and he fixed one in his own cap and the other in that of the captain. He shewed the captain what he had done, who was much pleased at this piece of thoughtful care.

On the last day of 1806, the ships were cleared for action, boats all prepared for service, light scaling ladders ready, and everything arranged for hoisting out the boats at a moment's notice, hook ropes being in the chains ready to tow them with.

The sheet cables were also passed out through the gun room ports, and carried forward and bent to the sheet anchors, ready to bring the ships up by the stern.

Captain Brisbane had thirty men, besides Hadley, his coxswain and the boatswain, picked out from the *Arethusa's* crew, whom he called "*Déterminés*" (whether so called from the frigate of that name, or the nature of the work they were expected to do, I know not, but I expect the frigate gave the name as appropriate for the work), those men were always to go in the launch with him if there was any boat service requiring his presence.

The boatswain had received instructions from the captain what to do when they were called upon to act.

At sunset, 31st December, 1806, the four frigates made easy sail down for Curaçoa: about one a.m. the boatswain was called, and ordered to turn the hands up, and have the hammocks lashed up, and stowed for action. But the pipe (whistle) was not to be used either by himself or mates.

When the lower deck was cleared, he went up on the quarter deck to report, and found the master in charge of the deck, who told him that he was to go down and let the captain know: when he went down, he found the captain with every officer in the ship around a large table, with a good supply of food upon it, and wine, beer, bread, cheese, ham, etc. Having given in his report, he was requested by the captain to partake of anything he chose on the table, and then to go on deck and relieve the master, "for I have given *you* your instructions," said he, "and have further orders to give to these officers."

Having helped himself to something to eat, the captain said, "Come, gentlemen, fill your glasses, and let us drink to the success of our undertaking: for by the Blessing of the Lord, the *Arethusa* goes into the harbour of Curaçoa this morning, if she never comes out again."

"That's it, is it," thought my father; so he helped himself to a glass of grog, and took some biscuit and cheese in his hand, and went on deck to relieve the master, whom he sent below.

The crew went to breakfast as soon as the hammocks were stowed.

The four frigates ran down in Indian file close along the land, the *Arethusa* leading with launches towing, ready for immediate service, the utmost silence being observed on board.

Just at daybreak the *Arethusa* hauled her wind and sprung her luff close round Fort Amsterdam, the first gun fired by the fort was considered by those on board to be the daylight gun, and that they were not aware of the approach of the ships, even while the *Arethusa* shot past the fort.

As soon as they were through the Narrows, two Dutch frigates (of whose presence they were not aware) opened upon them; Capt. Brisbane took the *Arethusa* to the berth he had previously intended to take up, and called out, "let go the anchor." My father cut the lashings of the sheet anchor with one blow of the axe, but the tar of the rope, drawn out by heat, stuck to the timber head; the anchor did not fall instantly, and my father, with the axe, prized the rope clear of the wood, and down it went; Capt. Brisbane, who was standing on a gun abreast of the wheel, when he called out, seeing that the anchor did not fall, jumped down, and ran forward,

calling out, "By heaven, sir, you have ruined the expedition through your ——" the anchor falling, caused him to stop, and not finish the sentence. The anchor brought her up, just as her fore-foot touched the ground, her bow rose about six inches, and her flying jib boom nearly touching the American Coffee-house windows.

The moment the ship *brought up*, the "Déterminés" were called away—and Capt. Brisbane, looking over the gangway when the launch was manned, called out, "Where's the boatswain?" "Here, sir," said my father (standing near the chest trees), "Go into the bow of the launch, sir, and stand by to board that frigate." "Aye, aye, sir," cried my father; and throwing a rope over the ship's side, went down into the bow of the boat, as the captain went down into the stern.

They at once pulled for the Dutch frigate (she had been taken so much by surprise, that her accommodation ladder was not taken in), and as the launch rounded to alongside, my father jumped from the bow on to the accommodation ladder. The lower steps were very slippery from the water having washed over them for some time, and my father's foot slipped, and he fell with his head against the ladder. "By ——," shouted the captain, "there is Kennedy down" (supposing that he was shot), and he instantly jumped on to the ladder alongside of my father; both ran up the ladder abreast, and one went through the gangway port, while the other went over the hammock nettings, followed by the Déterminés.

When they got on deck, they found the Dutch captain and a few of his officers (the men had left the guns and gone below, as the launch came alongside); "Strike your colours, sir," shouted Captain Brisbane; "I am alone, sir," replied the Dutch captain, "My crew have left me; you and your people are in possession of the ship, strike them yourself!" "Mr. Kennedy," cried Brisbane, "haul down that flag, and hoist ours." My father called a man named Riley to haul the Dutch flag down, and gave him a boat's ensign, that he had worn round his middle as a scarf, to hoist at the mizen peak: as soon as he had done so, he took the Dutch ensign to the captain, who was talking to the Dutch captain between the capstan and main mast. "Mr. Kennedy," said Brisbane, "take the Déterminés down on to the lower deck and send those Dutch rascals up."

My father has told me, that during his long service, this was the only occasion on which he ever felt hesitation; none of the other boats had arrived, four hundred armed Dutchmen were on the lower deck, and *thirty-two* Englishmen were to go down to drive them up; but, although he felt this hesitation, he did not

show it; but calling out, "Come on, lads," he laid one hand on the centre of the combing and jumped down on to the main deck, and from that on to the lower deck in the same way, followed by the men, where they formed a ring, back to back, and sent the Dutchmen on deck.

There was no fighting on the lower deck, the ship was surrendered as soon as boarded.

As soon as the lower deck was cleared, my father went up on to the quarter deck to report, but found a midshipman in charge: the boats had arrived from the other ships in support soon after he went below; and as the Dutch crew came up the hatchway, they were instantly sent into them, and put on board the English ships. "Where is Captain Brisbane?" said my father. "There he is," said the midshipman, pointing to Fort Amsterdam, over the wall of which he was just then scrambling, leading the stormers!

"What orders has he left for me?"

"That you are to remain here in charge of the prize; keep thirty of our own men *(Arethusa's)* and the slightly wounded, and make up forty-five, get a spring on the cable, and turn the frigate's broadside on to Fort Republique, double shot the guns and be prepared to open fire on Fort Republique when ordered, or to defend the prize to the last extremity."

They soon put the spring on the cable, hove the ship's stern round, till the broadside came on with Fort Republique, and double shotted the guns: then they had nothing to do but to look on, and my father describes the sight, as something that almost made him cry. Fort Republique, standing high behind the town, was firing through the town at Fort Amsterdam, with some of its guns, while the others were playing on the English and captured (Dutch) frigates.

The *Fisgard*, whose duty was to cover the landing and support the attack, was laying with a spring on her cables, pouring broadsides into Fort Republique through the town, while Fort Amsterdam, with English colours flying, had reversed the guns, and was also firing at Fort Republique over the ramparts, but the shot from all went through the town. In the town itself, the most horrible sight was witnessed, men, women, and children, were running about in the wildest state of terror, women in their night clothes with infants in their arms, ran down to the water's edge screaming to the ships for help. Dogs, horses, mules, even hogs, running down to the water, and making as much noise as they could, under the influence of terror: it was, altogether, a terrible sight for a brave man to stand and look at.

About half-past nine a.m., Captain Brisbane with his force, and as many cannon as he could get up with him, was in position a few yards from the walls of Fort Republique. At ten o'clock the white flag went up, and about fifteen minutes after, the British flag was flying on Fort Republique, and Curaçoa was theirs. The work being done as Captain Brisbane had expressed a wish, *before half-past ten.* Captain Brisbane was down in the town by eleven o'clock, and a proclamation was issued to the inhabitants, and the magistrates were ordered to open the Courts of Justice, and to proceed just as if the English had not arrived among them at all. The chief magistrate, a Dutchman, refused to open the Court-house door to Captain Brisbane, so he sent for carpenters and blacksmiths to unhang it, when a shot was fired through it, not far from Captain Brisbane's head! Having forced open the door of the Court-house, they obliged the magistrates to go on with their official duties, and order was perfectly restored long before night.

The Court-house door (a very fine mahogany one) was sent on board the *Arethusa*, the carpenter of her, Mr. Halbert, made a very handsome coffin out of it, the upper part of it being a correct model of the *Arethusa's* upper decks, with guns mounted, and every thing in its place.

The *Arethusa* was hauled alongside the quay, and left in charge of the boatswain with forty-five hands; the remainder of the officers and men being on shore in the forts: the *Latona* was sent to Jamaica with the news to the Admiral, and took also one million sterling from the military chest. The *Anson* frigate went home to Portsmouth, and carried four million sterling in specie, which was sent from Portsmouth in waggons, under an escort of sailors, to London, and the *Fisgard* was kept ready for action, for any other emergency.

The Admiral could scarcely be made to believe that the island was captured, and the general was so disgusted at *four* frigates having done what a squadron of line of battle ships and a land force besides had failed to do, that he refused to send troops to garrison the forts in Curaçoa, and the forts were consequently garrisoned for upwards of a year (thirteen months) by the crew of the *Arethusa*, Captain Brisbane acting as governor of the island.

The crews of the four frigates were considered very lucky fellows on account of the rich prize they had taken, and the small number of people there was to share the prize money.

Chapter VIII.

I have already stated that my father was engaged to be married, and on his return to England in the *Arethusa* he fulfilled his engagement; and having a good sum due to him in pay, and expectations of a large sum in prize money for the capture of Curaçoa, his worldly prospects, in his position in life, were very good. My mother was the daughter of a farmer in easy circumstances living near Canterbury; they were married at Chatham, but he was not destined long to enjoy the pleasures and quiet of a married life; his captain, now Sir Charles, having been knighted by the king for his gallantry and skill shewn in the capture of an important island, was appointed to the command of the *Blake*, 74, a new ship just launched at Deptford, and he took the warrant officers and several others from the *Arethusa* into her with him.

While they were at Deptford they had several offers from Jews to purchase their prize tickets for Curaçoa, and Mr. Halbert, the carpenter, sold his to one of them for three hundred and fifty pounds, the same man offered my father five hundred for his ticket, but he had had a little experience of Jews before, and would not take it.

Before the *Blake* sailed from the Thames, the captors of Curaçoa were informed that their prize agent was a bankrupt, and had absconded, so that no prize money was ever paid for the capture of that island. The Jew tried to recover his money from the carpenter, but failed in doing so. I have heard my father express an opinion, that he did not know who were the greatest rascals, the Jew crimps, who took his prize-money for taking the Cape, or the officials in power who kept that for the capture of Curaçoa, but the unction with which he denounced *both* parties, gave one an idea of a "good hater."

The late Sir Edward Codrington superseded Sir Charles Brisbane in the command of the *Blake*, and that ship was one of the fleet that accompanied the Walcheren expedition. The *Blake* got on shore when they attacked Flushing, and suffered severely; the batteries having set her on fire with *hot* shot: my father there acted in such a manner as to obtain the good opinion of Sir Edward Codrington, which he retained till the death of the latter.

The *Blake* afterwards served in the Mediterranean, and was much employed on the coasts of Valentia and Catalonia, co-operating with the army in Spain; she was at the siege of Tarragona, and contributed much to the long defence of that place.

When it became likely that Tarragona would be captured by the

French, many royalists who were there sent their effects on board the British ships, and waited to see how the affair would end before they themselves took refuge.

My father had been much employed away from the ship, in a large boat that pulled twenty-two oars, a kind of row galley that had lateen sail.

When the French ultimately stormed the place, all the ship's boats were employed bringing off the royalist refugees to the British squadron. The *Blake's* barge had a gun in her, mounted on a slide; she was pulling off to the ship, with as many people in her as she could carry: when a round shot from the shore struck her on the quarter just above the water, and passed out of the opposite bow, under the thwarts: she filled with water and turned bottom up, many of the people that were in her were of course drowned. The barge was drifting, bottom up, fast on to the beach, now lined with Frenchmen. The captain ordered my father to go in with his boat, and tow the barge out to the ship. As they pulled in towards the barge, the French fired every species of gun at them, till the shot and bullets fell into the water around them like a shower of hail; they however pulled in with a will, caught hold of the barge, parbuckled her over on to her bottom, and made her stern fast to the stern of their own boat, they then sat down to their oars to tow her out: the French instantly ceased firing at them, and cheered them as long as they were within hearing: they were within speaking distance of the shore when the French ceased firing.

My father considered this as the most chivalrous affair on both sides, in which he was engaged during the war.

When her term of service was expired, the *Blake* was paid off at Portsmouth, and as the warrant officers were at that time kept on board their ships always, my mother was living with him on board. He purchased a lottery ticket when he first came home, and was looking anxiously for advice of the number drawn for him, expecting of course that his would be a prize; he was walking on deck one morning when the postman came on board, and gave him a large official letter with a printed direction, "Is this the lottery ticket," says my father (not reading the address), "I think it is," said the postman. He hastily tore open the letter, and saw £917 17s. 8d. in large figures at the bottom of a page, he did not wait to read the letter, but ran down below, threw the letter to my mother, crying out "Here's a prize at last," and went to his drawers and took out a Spanish dollar (several of which he had picked up in Spain) and ran on deck, and gave it to the postman, and would

not take any change. Shortly after my mother sent up for him, and said, "There is some mistake, this is not a lottery ticket, this is a letter from the Admiralty, read it;" he did so, and discovered that in his returns of stores, there was a deficiency of a cable, one hundred and fifty fathoms long, and that his pay was to be stopped till the value of the cable, £917 17s. 8d., was made good. The said cable had been made for the *Blake* to ride by in deep water on the coast of Catalonia: but when the transport brought it to the ship, it was found to be too large for the hawse holes, and also for the tiers, and being unmanageable, was sent back in the same transport, proper receipts being given by the master, and countersigned by the captain. My father not being able to get over this difficulty wrote to Captain Codrington, who appointed a day for my father to meet him at the Admiralty. When there, Captain Codrington shewed the receipts of the master of the transport, countersigned by himself, and enquired if my Lords doubted the truth of a document vouched by him, "No," said my Lords, "but where is the cable?" "What is that to me," said the captain, "or to my boatswain either? The captain of the transport may have payed it overboard for ought we care, go to the Transport Board, and enquire for it!" Before the Captain left the presence of my Lords, he procured a written order from the proper quarter for my father's pay, which order was attended to. The cable was found upon enquiry to have been landed at Gibraltar dockyard two years and four months before my father's pay was stopped.

It is not easy to conjecture what might have been the ultimate fate of my father, if Captain Codrington had not taken up his case in the spirited manner he did; but the above is a specimen of those cases, which occasionally drove some of the bravest and most experienced of our seamen to serve in American ships of war; to stop the pay of the father of a family, while he himself was kept without the means of doing anything for their maintenance, was a part of the wisdom of the government of the day to stimulate the energies of others. And this not for any neglect of duty on the part of the sufferer, but because some storekeeper's clerk had omitted to forward a correct return.

While the question of his pay was under consideration, he was transferred to the *Medway*, 74; that ship went to the Cape of Good Hope, as flag-ship. He remained in her, and returned when her term of service expired. He afterwards served in the *Aboukir*, *Northumberland*, and *Spartiate*, and also in one or two ships in ordinary: but nothing very noteworthy occurred after the war that would be interesting to strangers.

He was pensioned after forty-five years' service, twenty-six of which he was a warrant officer, and above twenty-two years of that time at sea, on £65 a year. He was much respected by the officers under whom he served, and he retained the friendship of Sir Edward Codrington to the last; and the latter officer put me and my brothers into the Royal Naval Asylum School at Greenwich, where three of us were educated; my father educated the other two; four of us became chief mates before we were twenty-two years of age, and all have now been in command of merchant ships upwards of fifteen years. My father died in 1854. He was a very strong muscular man, near six feet in height, but as active as a cat. During the war he was considered one of the best swordsmen in the British Navy.

Thus ends the memoir of a true British tar; one who never knew what fear was; one of the many hearts of oak that gained for England such a glorious yet such a terrible reputation, and it is with peculiar pleasure that I his eldest surviving son offer this memoir to the nautical community.

In concluding this short account of my father's life, I feel bound to express the great obligation I am under to Sir Edward Codrington for his many kindnesses to my father, and particularly for my own education which I received through his influence, and which has enabled me to follow out the profession of a sailor, with some degree of success. And as I pass the old palace of Greenwich in taking my ship out or bringing her home from India, I raise my hat in token of my love and respect for the school that made a man of me, and fitted me for the position I now fill.

(Conclusion in the next Number.)

LIGHT DUES.

A NEW edition of the Consolidated Tables of Duties for Lights, Buoys, and Beacons in the United Kingdom, chargeable on oversea and coasting vessels has recently been issued, after approval by Her Majesty in Council. The new edition has been rendered necessary by the recent reductions and modifications which have been made in the levying of the duties, and by the establishment of numerous new lights since the last edition (1864). At the same time the opportunity has been taken to make certain alterations in the

arrangement of the work, by which the labours of the collectors at the various outports will be lessened, and additional facilities given for determining the rates chargeable on any voyage.

Concerning the reductions referred to, a few particulars will probably be interesting to our readers who may not be fully acquainted with their scope. The Government and the Trinity House have repeatedly had under consideration proposals for modifying the incidence of light duties, and more than once has the entire abolition of these dues been pressed upon them. As to the latter proposal however, it has been determined, and we think wisely, that for the present it is not expedient to throw the cost of maintaining the lights, etc., upon the country at large. It is needless to go into the arguments which have been used on either side in this matter, it is enough to say that the weight of opinion is against abolishing the present mode of paying for the marking of our coasts, and is in favour of the principle that those who use the lights and marks to their own benefit ought to pay for them. This question is for the present set at rest by the disposition since shown by the Government to modify and reduce the charges to some extent, so as to do away with certain anomalies and prevent undue pressure in particular cases.

In considering how to relieve the shipowner most effectually, regard was had to the enormous development of steam navigation since the liability of vessels to pay dues for certain lights was first established. In these days steam-ships can under almost any circumstances make straight courses to their destinations, without using the lights which had been set up with the view of aiding sailing ships to make certain passages, and on the face of it, it did not appear to be just that the steamer should pay dues for lights she did not use. The first object the Authorities seem to have proposed to themselves in the contemplated reductions, was to make things more fair for the steamers. Accordingly the privilege of return passages was agreed on, viz., that "All vessels trading between ports in the United Kingdom and ports in Europe (excepting ports in the Mediterranean) shall, in respect of every light passed on the whole voyage out and home, be liable to only one payment of dues for each general passing light." In addition to this sundry reductions and variations were resolved upon as respects the dues chargeable for lights on the east coast, by which both steamers and sailing ships employed in particular trades along that coast would be greatly benefited. They may be summarised as follows; vessels trading from ports south of Berwick to Bergen and vice versâ, are relieved from payment of dues for all lights to the north of St.

Abbs Head which they had hitherto paid, and vessels from ports north of Bergen to ports between Seaham and Yarmouth and vice versâ, are relieved from payment of dues for all lights north of Souter point.

Again, vessels trading between ports in northern Europe to Yarmouth and ports south, are relieved from payment of dues for all lights northward of Winterton, to which they had previously been liable; and vessels from ports between the Eider Canal and Rotterdam to Dover and ports south and west, are relieved from dues for all lights north of the Kentish Knock; and vessels from ports between Rotterdam and Antwerp to Dover and ports south and west, are relieved from dues for the Kentish Knock, which dues such vessels had previously paid. These reductions operating with the return passage arrangement, will cause a very considerable diminution of the dues to be paid in many cases. The dues for the Smalls and Skerries Lights on the west coast have also been lessened; these latter reductions will be felt particularly by the Liverpool trade and vessels trading between this country and the United States.

Lastly, a vessel bound for a foreign port and calling for orders at any port in the United Kingdom, is to be charged only with the lights passed on her inwards passage to the port of call.

The effect of these reductions will be to adapt the incidence of the dues to the altered conditions of navigation, so that they may apply with greater fairness to all classes of vessels, and to relieve the British and Foreign shipowner as far as present circumstances will permit.

These are the principal features in the new edition of the tables of light dues, and we think the shipping world may fairly welcome the changes made as an earnest of good intentions on the part of Government. Somebody must pay for these things, and the British taxpayer is we fear not yet so advanced as to be willing to bear the cost of maintaining sea-marks, because of their humanitarian or cosmopolitan utility. Rather he regards it in his practical way, that whoso directly benefits by anything should be prepared to pay for it, and though perhaps on wider grounds we might be disposed to view with satisfaction the total abolition of all such charges upon shipping, yet we think one of the least grievous is this charge for lights, and are of opinion that the shipowner has little cause to grumble at being called upon to pay for the maintenance of these guiding and warning marks which so materially assist his trade.

THE ROYAL OBSERVATORY, GREENWICH.

An unusual stir and agitation is observable about that generally very quiet and unostentatious building in Greenwich Park on the afternoon of the first Saturday in June, leading a stranger, or even the habitué, to wonder "what is up" at the Observatory; and the usually closed park carriage gates on Blackheath standing wide open is tempting to the visitor in the open fly, to get off the hot dusty heath and drive down the tempting vista under the shady trees of Blackheath avenue, but Jehu knows better than to turn his horse's head within those sacred precincts, and in reply to the "Why not?" says, it is only for the "Wisitors," and in answer to the averment that they are visitors, quietly says, "Yes, but not of the right kind!"

Saturday, 3rd June, was the day on which, in this year, the annual visitation took place, the one day in the year, when the Royal Observatory is to some extent "on the spree," and in holiday attire.

But who are the "Visitors" that create such an unusual stir? and what do they do when met in solemn conclave within those mysterious walls? Are they medical men who have to examine into the state of mind of those who are so constantly following the moon in all her phases, and wandering among the stars? or is there any masonic or religious ceremony performed or gone through in those dimly lit chambers beneath the earth? Neither the one or the other, it is simply a check on an important public servant, a matter of form and yet by no means a form. Be it known to you reader, that if you are an M.P., or even if you are not, and wish to be "down" on the Government, or intend to come out with a "stunning" speech on the economies of the day, there is not much difficulty in obtaining admission into any of the royal dockyards, where you may count Seeley's pigs—provided you do not pocket any—and take careful note of whatever may seem to you reckless extravagance or mismanagement on the part of the Administration, but if, in the confidence of your M.P.-ship you think that will be an "open sesame" to the Royal Observatory, you will be much mistaken; to prevent interruption of the important work going on or injury to the delicate instruments, a slight impediment is interposed before the mere curiosity-monger, and he is referred to the Hydrographer of the Admiralty for an order, of course very easily obtained! a polite note is written to that functionary for the purpose,

and as duly replied to, but instead of an order as expected, he receives a printed letter, informing him, that their lordships are always desirous of affording to those persons who are anxious to obtain information on astronomical or meteorological science, such assistance as may be derived from an inspection of the instruments at the Royal Observatory, *but*, at the same time, do not consider that the important duties of that public scientific establishment should be incommoded for the gratification of mere curiosity, and in reference to his request for permission to inspect it, a printed form is forwarded, which if returned with the questions thereon answered, their lordships will *then* be enabled to consider the propriety of complying with his wishes.

The enquiries on the printed form in question are enough to make his very hair stand on end. What particular branch of science he is interested in. Whether he has an observatory of his own, or is in the habit of making astronomical, magnetical, or other observations; for what purpose he wishes to pay the visit, etc., and his reference to men of science, etc.

There is a story told of a lady who desiring to visit the Observatory, wrote from the country requesting an order for herself *and friends*, and wished it to be ready by a certain day as she had some friends coming up with her and others to meet in town, and should not like to disappoint them,—evidently intent upon a regular pic-nic! Champagne and lobster salad in the great equatorial! Oh ye gods! little did the Astronomer Royal dream, as he quietly pursued his quiet studies on that day, what was intended for him, and happy was he in his ignorance, or we fear there would have been more perturbations than those of the moon, and even the unifiler and bifiler magnetometers would have received a shock from which they would not easily have recovered, but the usual form was forwarded to the lady and nothing more was ever heard of her or her party.

To return to the visitation, the occasion of its origin was soon after the establishment of the Royal Observatory, when old John Flamsteed reigned supreme, and was literally "monarch of all he surveyed;" he isolated himself within its walls, and would let no one in and nothing out, and like a miser heaped up his wealth and kept it all to himself. This might have been very satisfactory to himself, but to others who were patiently waiting outside for information and some results from the national establishment, it was not quite so satisfactory, and they used their prerogative as Englishmen to growl and grumble, and this they did so loudly and so effectually, that although they did not dethrone the monarch

they changed the status of his sovereignty from an absolute to a limited one, and he had to submit to a privy council by no means always in accordance with his views. A "Board of Visitors" was created, composed of the leading scientific men of the day, to examine and report on the state of the Observatory and instruments contained therein, and also to direct—yes, direct—the astronomer to make such observations as they, in their judgment, thought proper, and there is no doubt they exercised their power, and there can also be but little doubt that to that combined judgment we must mainly attribute the perfectness of the present establishment in its various details.

The Board as at present constituted, consists of the Presidents of the Royal and Astronomical Societies for the time being, five Fellows of each of those Societies, the Hydrographer of the Navy, and others who "make the stars their study," and a following of some score of amateurs whose taste and studies may be either astronomical, meteorological, magnetometrical, or any other "cal," and we may add, a few who don't know much about any "cal," and wish they did, as without they sensibly feel they are out of their element.

It is not to be supposed that this "Board" is a species of inquisition to spy out all the Astronomer Royal's weak points, and to "haul him over the coals" for them, it is a much more amicable arrangement, for the Astronomer Royal can if he needs it, at all times command the soundest and wisest counsel, not only in England but in Europe, and doubtless on the principle that two heads are often better than one, he does consult others, but this does not appear on the cards; he has now to explain to the Visitors what he has done through the past year, entering into details of the various departments under his superintendence, all of which is embodied in a report previously prepared and read to the visitors. A copy of this Report has been kindly furnished us, and as very many of our readers have not been so favoured we will attempt to give an idea of what it is.

The Report is arranged under the following heads: 1, Buildings and Grounds; 2, Moveable property; 3, Manuscripts; 4, Library; 5, 6, and 7, Astronomical Instruments, Observation, and Reduction; 8, Printing and distribution of Astronomical Observations; 9, 10, and 11, Magnetical and Meteorological Instruments, Observations, and Reduction; 12, Printing of Magnetical and Meteorological Observations; 13, Chronometers, Communications of Time, etc.; 14, Personal Establishment; 15, Extraneous Work; and 16, General Remarks.

It is not our intention to follow the Astronomer Royal through the various headings of his report or his visitors through the various rooms, from the anemometer house on the top of the building, "where the stormy winds do blow," and register themselves in the several phases of direction, force, and speed to the cellars in which the declination, horizontal force and vertical force magnetometers quietly vibrate and, by means of photography, tell their silent tale of magnetic storms and perturbations, of which finite man can only, as yet, know the effect but cannot fathom the cause,—as we propose to ourselves some day in the slack season (whenever that may be) to give a more special account of this National Establishment that effects so much for nautical men, and about which nautical men generally know so little; it is enough for the present to say that each head of the report is carefully digested. Some idea may be had of the exactness required, and difficulty of adjusting the instruments, from the following extract from Section 5. It relates to the transit circle.

"The correction for level-error in this instrument having become inconveniently large, owing apparently to a gradual subsidence of the eastern support since the erection of the instrument, about a ton weight of stone was placed on the western pier in August last. Not the slightest change, however, could be traced as due to this; the level-error maintaining its usual value. This plan having failed, the stones were removed on November 19, and a sheet of very thin paper, $\frac{1}{70}$ of an inch in thickness, was placed under the eastern Y, which was raised from its bed for the purpose. The collimators having been observed just before this operation, no difficulty was experienced in adjusting the instrument so as to have very nearly the same error of azimuth as before. The mean annual value of the level-error appears to be now sensibly zero."

Although much is done by means of self registration, still much remains to be done by the eye and hand, as may be gathered from the report, where it is stated that no fewer than 8500 observations were made with the transit circle, and nearly 2000 with the altazimuth in the course of the year.

Strangely erratic are the pursuits of man, and more strangely erratic are the pursuits of that genus or species of man yclept philosophers; nothing is too lofty and nothing is too lowly for their prying investigation, at one time trying to ascertain what the stars and their atmospheres are composed of, and the very heat they convey to the earth; at another investigating the component parts of the very dust we breathe; and here we have the man who tried to get out of his atmosphere by means of a balloon,—and nearly suc-

ceeded, — quite at home in superintending the magnetometer beneath the surface of the earth. The Astronomer Royal duly yields Mr. Glaisher the credit due to him, and be it remembered, through the kindness of the first named gentleman, we are indebted for the record of some of those magnetic observations, which appeared in our April number, viz., the Mean variation of the Compass and Dip of the Magnetic needle for every month of last year.

In the chronometer room are a couple of hundred chronometers all ticking away at the top of their bent, and when the nautical man who keeps his chronometer register and comparisons (with his two or three watches) regularly, remembers the trouble and care requisite in tending them, he may justly appreciate what the same must be for two hundred, and not only are these registers kept, but the chronometers have to be tested for temperature, and in different positions for magnetic influence.

Under Section 15, we find that not only the regular and constant duties have to be attended to, but that even "extraneous work," as this heading shews, is often imposed or undertaken by the establishment, as the following Extract states.

"The trials and certificates of hand-telescopes for the use of the Royal Navy have lately been so frequent that they almost become a regular part of the work of the Observatory. The labour and occupation of time upon them, when due respect is paid to the convenience of the Observatory, are not great; but without proper care, an intrusive task of this kind might be very injurious to the interests of the Observatory (as chronometers were, many years ago). I may state here that by availing myself of a theory of eye-pieces which I published long since in the Cambridge Transactions, I have been able to effect a considerable improvement in the telescopes furnished to the Admiralty."

From the "general remarks" we learn that although much has been done and much is constantly doing, yet more scientific work is desirable which has not yet been commenced, but which requires a larger force to deal with. They do say, "there is no satisfying a philosopher," and the line of the song, "if you give him all he wants he'll ask for nothing more," is not applicable to him. Be that as it may, we can but admire the spirit that constantly desires "pastures new" for philosophic investigation, when in all human probability he who desires them may not live to reap the fruit.

We shall conclude our notice with the Astronomer Royal's report in regard to that part of the Royal Observatory so valuable to nautical men, the time-ball.

"On eight days the Observatory time-ball was not raised on account of high wind; and once the drop failed from the piston not being properly discharged. On all other occasions everything has worked with the greatest regularity."

"The public clock near the entrance gate of the Observatory has been cleaned and put in thorough order. All the wires concerned in driving the system of sympathetic clocks have been renewed."

"Some repairs have lately been made in the mast of the time-ball at Deal. An improvement is to be remarked in the regularity of our communication with that ball. On 89·4 per cent. of days in the past year the ball was dropped freely; on 4·9 per cent., principally in damp weather, the current was too weak to release the trigger without assistance from the attendant; on 1·9 per cent. the wind was too high to permit the raising of the ball; on 3·2 per cent. communication was interrupted; on a single day the ball was falsely dropped by telegraph currents; while on another occasion a defect in the trigger (which has since been remedied) prevented the dropping of the ball."

"A proposal has been made to have a ball dropped on the same plan at Queenstown, which can be done without any difficulty."

As a postscript, we may add, that the visitation is not altogether intellectual, and by no means the worst part is the last, or what follows the last, the adjournment to the "Ship" or the "Trafalgar" to dinner, where we will not intrude, excepting to join in what is no doubt the toast of the evening, "Success to the Royal Observatory at Greenwich."

NOTES ON NAVAL FLAGS.

II.—EARLY SIGNALS AND THE SIGNAL CODE.

FAR back in all the fantastic imagery of mythological lore, is to be found one of the earliest parallels to the present communication on the sea by means of signals. No obedient frigate, eager to repeat the Admiral's dumbly significant orders to the squadrons through the heat and smoke of the battle-line, in these poetry-shorn days,—nor merchantman hoisting her mute cry of distress on the wide waste of waters upon which, in the distance, she descries a sail,—ever watched for the expected signal with a vigilance greater than that of old Ægeus, in the ancient story, who awaited on the shores

of Athens the return of the black-winged ship from Crete. The vessel had gone forth upon her voyage, freighted with the costliest human sacrifice that the conqueror Minos could have wrung from the old king: she bore to Crete, to feed the great jaws of the fabulous Minotaur, his dear son Theseus, who had drawn the lot, or, as some say, had voluntarily undertaken this year to be the offering. "If ye bring him back in safety," planned the king, trusting his son's preservation to the gods, "ye shall hoist a white sail (or flag), that I may be apprised thereof while yet ye are far out."

Theseus was saved, but through some mischance those on board forgot to hoist the white signal, and Ægeus, watching on the shore, saw in the dim distance the prow of the expected vessel nearing home, and beholding the ordinary black sails only, gave up his son for lost and, broken hearted, flung himself into the sea.

Apart from classical fables, it is difficult to trace, in the history of the early Greeks, by what means the movements of great fleets were directed; but when we reflect upon their character as a people eminently intellectual, warlike, enterprising, inventive, and upon the importance and necessity of *some* method of communication between the commanders of the different leading war-ships in a naval engagement,—when, too, we remember that the Romans and Carthaginians, in the disastrous Punic Wars, did adopt some system of signalling, it is reasonable to infer that the Greek admirals had likewise pre-concerted signals, doubtless scanty and imperfect compared with modern codes, yet in all probability comprising more than the bare sign given for the onset and termination of a battle. For note, in reviewing the military life of the Romans, that all the evolutions of the Roman army were, in point of fact, regulated by their standards, so that the movements of a body of troops were directed by these signs or signals, expressive of, and understood as, intelligible orders; and we can scarcely suppose that the nation that broke the Persian power at Marathon, and, ten years later, swept it from the sea in the destruction of that almost incredibly gigantic fleet off Salamis, could have been without the warlike dignity of order which characterized the formation of the celebrated legions of Rome.

Compilers of ancient curiosities have given us some slight clue to the way in which commands may have been indicated, by relating that in naval engagements a gilded shield was hung out of the admiral's galley (sometimes a red garment or banner), the elevation of which declared that the fight should continue; its depression was, perhaps, read to mean "Retreat," and its inclination

to the right or left possibly directed the ships how to attack the enemy.

Signals, it seems, have been in use, under a variety of forms, through all ages. Formerly the signal, whether of war, or victory, or peace, was raised on some lofty eminence, for the reason that it thus gained a wider notoriety. "Lift ye up a banner upon the high mountains," sang the prophet Isaiah. Favourite signals of olden days were brilliant lights. Upon the heights Agamemnon, after the taking of Troy, lighted signal fires to flash the light of victory the more quickly to the eyes of Clytemnestra. In Spain, long after, the Moors erected turrets, or watch-houses, from which the warning red flames blazed; in England and Scotland, on the authority of Bœthius, stood the remains of large poles that have served as beacons; and the lighting of beacons on the tops of hills is vividly recalled to us by the pen of Sir Walter Scott, in the charming cantos of the "Lady of the Lake." The language of signals is of necessity, one that appeals more strongly to the eye than to the ear, though by night and through the dreariness of a deep fog, the tolling of bells, and beat of drums, and boom of guns, take their share with the light from lanthorns, and the golden shower of rockets and squibs. Thus, if we permit poetic analogy, the white sail agreed to by the sailors of Ægeus, and the watch-fires of Agamemnon, are reflected in the white flag and the signal fires of our present code: a code that we owe mainly to the intelligence of an accomplished Frenchman named De la Bourdonnais, first instanced under Elizabeth in the expedition to Cadiz, and enlarged by the nautical wisdom of the Duke of York, during the war of 1700.

The want of some complete system of signals was strongly felt in that age of maritime adventure and enterprise, the seventeenth century, and led to frequent confusion and mistakes in the numerous engagements with the Spanish and Dutch, that marked its commencement. The "good Duke of Medina Sidonia"—and of many other dukedoms and honourable orders—who quaintly styled himself, "Captain General of the Ocean Sea," notified, in the orders appointed for the Spanish Armada, that his wish to hold communication with the different commanders of the fleet, should be signalled by the hanging out of a flag attached to the after mizen near the lanthorn, "seeing which they shall repair unto him to know what he will have;" and Lord Charles Howard of Effingham, after the first skirmish in that notable Armada, "put forth his flag to call the other captains to counsel." There is a curious paper in the Harleian Miscellany, detailing the magnificent

arrogance of H.R.H. the good Captain General of the Ocean Sea, in the commands issued to the enormous armament that was to set sail from the port of Lisbon to measure strength with Drake and Hawkins and Frobisher, the naval giants of their time, of which great armament only fifty-three splintered hulks were to draft back, degraded, to the coast. In this paper we find that the ships of the Spanish fleet received orders to repair to their admirals every night "to take the word," and "if it happeneth some days that the wind will not suffer to take the word of the admiral or admirals, they shall have for every day in the week the words following:

Sunday	Jesus.
Monday	The Holy Ghost.
Tuesday	The Holy Trinity.
Wednesday ..	Saint James.
Thursday	The Angels.
Friday	All Saints.
Saturday	Our Lady.

He further orders that the admiral shall be saluted with trumpets, failing trumpets, with whistles, "and the people to halloo one after another." It was under Elizabeth that the British fleet first received anything like a regular set of orders. In the expedition to Cadiz, she commanded her secretaries to draw up instructions which were to be made known to the adjutant, the general, and five councillors of war: this list of instructions they were to copy and transmit to the "several ships of the navy," an arrangement that rendered it possible for the commanders to hold intelligible communication with one another, and possibly obviated the necessity of hanging out the flag to summon inferior officers aboard the chief admiral's ship "to know what he would have." But to James, Duke of York, renowned as the pupil of Turenne, he who afterwards, himself a pensioner on the bounty of Louis le Grand in the shades of St. Germains, lent the aid of his nautical knowledge to the great Colbert;—to him must be accorded the honour of having been the first to understand the real importance of a signal code to the navy. In his Memoirs, written by himself, we come across the following remarkable passage:

"1665. On the 15th of March, the Duke of York went to Gunfleet, the general rendezvous of the fleet, and hastened their equipment. He ordered all the flag officers on board with him every morning to agree on the order of battle and rank. *In former battles no order was kept*, and this, under the Duke of York, was *the first in which fighting in a line* and a regular form of battle was observed."

It was James II. then who put together roughly the framework of the signal code, and it was De la Bourdonnais who devised the ingenious method of making the signals expressive, not of orders only, but of simple numbers which are prefixed to the various articles of the code. Thus an officer seeing a signal hoisted by the admiral may report the number to his captain, who translates its signification by means of his naval vocabulary, without the officer or any other on board knowing to what it may refer. Carefully and wisely in making choice of the colours which were to compose his flag-system, De la Bourdonnais selected only those which could be recognised from a distance and not confounded with each other; colours adopted by other nations for reasons specified in our last paper—the essential qualities of all signals being, simplicity and distinctness. Think of the vast number of movements explained and commanded through the medium of flags, and of the order and simplicity by which these movements are regulated! For by combination of the colour and position of signals may be determined the place of a ship in the battle-line, or of a ship in her particular squadron, or in her particular division of a squadron, or even just her place in that division; and, by the same means may be advertised the need of vessels in distress, or asked from one captain to another the commonest of questions. The systems of Sir Hume Popham and Captain Marryat are numerical, alphabetical words, letters, and sentences being arranged in the fashion of a dictionary; a system that in the "New Commercial Code of Signals" is rejected in favour of one which distinguishes the signal-flags to be used, by alphabetical letters, retaining the flags adopted by Sir Hume Popham and Captain Marryat in order to render the change of code a matter of small expense. Not until the year 1817 was there any system of signs in the Merchant Service; and previous to the year 1854, when was brought into operation the bill for consolidating the laws relating to British merchant ships and seamen—which assigned to each vessel an unalterable number and name—the difficulty of distinguishing a vessel by signal was deplorably great. By the passing of the bill, it was ordered that a special number should be given to every registered British vessel, which number should be carved on her main-beam, and neither her number nor the name allotted her by her first owner might be changed "so long as she lived;" consequently, it would not henceforth be imperatively necessary to find out, in addition to her number, her port of registry and the year of registry in order to distinguish her from other ships bearing the same name. In drawing this brief sketch of signals to a close, we cannot resist the temptation of

recalling the world-famous telegraph signal of the chief hero of our naval records whose ashes lie

"Here in streaming London's central roar,"

beneath the dome of St. Paul's, and whose "splendid example," to quote the words of Dr. Beattie, "will operate as an everlasting impulse to the genius of the British navy." That famous signal

"England expects that every man will do his duty,"

hoisted from the mast-head of the *Victory*, was greeted with cheers. The vessel bore Lord Nelson's flag at the fore (white, red cross), the national Union Jack, and the ensign of St. George. It is difficult to read the records of the many acts of heroism connected with the history of that ever memorable 21st of October unmoved;—from the death of the "greatest sailor since our world began," closing his eyes amid the roar of cannon in the noble discharge of duty, beneath the emblematic crosses of the English nation;—to the simple, but touching story of the gallant tar of the *Leviathan*, who had his arm shot off, and insisted on singing the whole of "Rule Britannia" during the amputation, in order to cheer and strengthen his wounded comrades.

We believe it is not generally known that Lord Nelson in directing the signal to be made, gave it, "England *confides* in every man to do his duty;" but the word *confides* not being in the vocabulary, Lieutenant Pasco, of the *Victory*, suggested the word "expects," a suggestion to which Nelson instantly assented. It is a curious fact that the ship which in this action bore the French commander-in-chief had no flag flying, the admiral's flag being carried by a frigate.

In days to come, we hope for one universal code of signals, which irrespective of language will render it possible for the navigators of all nations to hold communication through the medium of flags. Such a perfecting of the code would be a world-wide benefit.

MAR TRAVERS.

THE VOYAGE OF THE GALATEA.

THE voyage of the *Galatea* must not be passed over in silence—not necessarily because she was commanded by His Royal Highness the Duke of Edinburgh, but because we believe that no ship has made

so extensive a voyage for many years past. Doubtless it had its political significance in bringing vast numbers of Her Majesty's subjects to a more intimate knowledge of the family of their Queen; and in these days, when (to quote Mr. John Michel Trutz Baumwell) "that respectful and chivalric loyalty to the Sovereign" "has (nearly) disappeared," we candidly confess we are not sorry for the political significancy; but our business is with Her Majesty's ship of war *Galatea*, 26, Captain H.R.H. the Duke of Edinburgh.

The *Galatea* was commissioned at Devonport, in January, 1867, and has therefore been over four years in commission; in that commission she made two voyages. In her first voyage she visited Lisbon, Gibraltar, Malta, Marseilles, Madeira, Rio de Janeiro, Cape of Good Hope, and Australia, where the progress of the voyage was checked by the dastardly and cowardly attempt on the Duke's life by the ruffian O'Farrell.

On his Royal Highness's recovery, the *Galatea* returned to England, and arrived in July, 1868; again sailing in November, touching at Madeira and St. Vincent, Cape Verde Islands, she arrived at Simon's Bay on Christmas Day, and on the 6th January, 1869, she was again under way for Melbourne, where she arrived on the 22nd of the next month, having called at Swan River and Adelaide. The ship again visited Sydney, where without disrespect to His Royal Highness, we may say he was honoured by being the person to lay the foundation-stone of a monument to that great predecessor of his, James Cook, the navigator.

Leaving Sydney on the 3rd April, the *Galatea* proceeded to Wellington, New Zealand, and from thence visited Nelson, Lyttleton, and Auckland. From New Zealand it was intended to visit Fiji, *en route* to Tahiti and the Sandwich Islands; but as the ship was detained at Auckland longer than was expected, she proceeded at once to Tahiti, where she arrived on 3rd August, and after a few days' stay went on to the Sandwich Islands, and from thence to Yokohama, where she arrived on the 29th August. From Yokohama the *Galatea* went to Nagasaki, and then to Chifu, Shanghai, and Hong Kong, and finally left China, and touching at Manilla and Singapore, reached Calcutta on the 22nd December. As may be supposed, there were grand doings and ceremonials at that place, and also at Bombay, to which place the Prince went overland, the most professional being that of laying the foundation-stone of a new Sailors' Home at the last-named place. After visiting Madras, the *Galatea* left for Ceylon, and successively visited Colombo, Trincomalee, and Point de Galle; from thence to Mauritius and Simon's Bay, where orders awaited her to again proceed east,

which she did, going over much of the same ground she had already been over. At Sydney the *Galatea* was docked for repairs, and on leaving that place may be said to have been homeward bound. She touched at the Falkland Islands, and then visited Monte Video; she left Monte Video on the 17th March, and touching at Fayal, reached Plymouth on the 19th May, and was paid off on the 2nd June.

During the first voyage of the *Galatea* she went over upwards of 33,000 miles, and in her second more than 66,000 miles,—in all nearly 100,000 miles.

Notwithstanding the special mission of the *Galatea*, and all the unusual gaieties and attentions the officers and men received in consequence of the rank of their Commander, and which may be thought to be rather subversive of discipline, we have reason to believe the *Galatea* was in thorough order as a man-of-war, and that although the Captain became a Prince the moment he stepped over the gangway, he was not the less Captain when he stepped back again; and as she was a happy ship, we may confidently assert, from our experience, that she must have been a strict ship, and from the creditable way she "paid off," there must have been an "esprit de corps" in both officers and men worthy of commendation in itself, as stopping the cynical remarks and observations of those who might be willing to detract from the credit due to the ship simply from the fact of her being commanded by a royal Duke.

MARINE STEAM ENGINES.

HINTS TO MASTERS AND MATES—*(Continued)*.

Steam Pipes. The steam pipe which is connected to the stop or communication valve on the boiler or superheater, serves to convey the steam from the boiler to the superheater, or from one boiler to another, if there is more than one boiler, and from the boiler or boilers to the engines, and ought to be made of wrought iron *if* passing through the uptake; in such a case it is really a part of the boiler, when the pipe is subject to the direct impact of heat and flame, and should not be of cast-iron on account of its cheapness. When clear of the uptake copper ought to be used, cast-

iron being of an uncertain nature, and for such purposes not to be depended on. Makers who have used cast-iron in their early days have seen the folly of continuing its use, owing to accidents, and in fact have removed it even from their stationary engines, as the cast-iron all gave out, and replaced it with copper.

Doubtless engines can be made much cheaper if cast-iron is used for steam pipes and feed pipes, and when the manufacturers can persuade the purchaser to allow its use, the purchaser, generally from want of practical knowledge, is glad to get a pair of engines at a low price per nominal horse power, not knowing the danger to which he is subjecting all on board by not having all made and constructed in the best way and of the best materials. There is more necessity now to point this out clearly to nautical men and others interested in marine engineering than formerly, owing to the high pressure at which marine boilers are worked. The time will doubtless come when those who now like to use it owing to its cheapness as to first cost, will be even astonished at themselves for ever thinking of using cast-iron in the reckless manner they have done, and like reformed sinners will cry most loudly against what was previously their own peculiar weakness. Steam pipes ought to be fitted with expansion joints, so as to allow for expansion and contraction. The throttle and expansion valves are placed on the steam pipes close to the cylinder, and serve to regulate the amount of steam wished to enter the cylinder, and consequently the speed of the engines.

Management of the Boiler, Stoking, and Firing. The firing or stoking of a boiler is a very important thing, and requires great care, skill, and attention on the part of the stoker. It takes several years' experience to make a really good stoker; the coals should not be put on in larger pieces than about twice the size of a man's hand, and should be quickly and regularly put on, taking care not to overload the fire bars, at the same time seeing that there are no places so thinly covered that cold air can pass into the furnaces; if the bars are too thickly covered the fires will burn sluggishly. It is necessary that the person in charge should occasionally look into the furnaces, and see how the stokers do their duty, and that the fire is kept at a proper and regular thickness on the bars; the thickness of the fire on the bars must to some extent depend on the quality and description of the coals used, etc. Some coals are dirtier than others, and the clinkers forming will require to be removed according to circumstances. It is usual when at sea to clean the furnaces by rotation; the cleaning out of the furnace ought to be done very quickly so as to admit as little cold air as possible. All

ashes and coals ought to be drawn well away from the boilers before they are wet,—boilers are much injured by neglecting to attend to this,—and water ought not to be thrown into the ash pits.

Pressure. The pressure of steam ought to be kept as regular as possible. This can only be done by attention to the fires and keeping the water at a uniform height in the boiler. The steam should not be allowed to blow off, as fuel is wasted by allowing the steam to escape; it is therefore well to keep the steam about one pound below the pressure at which it would lift the safety valve.

Height of water. The height of the water in the boiler should be nearly halfway up the glass guage, except in very smooth water, when it may with advantage be kept a little lower. By constantly using the brine cocks the water may be kept fresh, and the waste regularly kept up by a proper adjustment of the feed cocks; having recourse occasionally to the blow-off cocks, previous to which the feeds may be opened a little so as to increase the water in the boiler, and then it may be blown down slightly below the ordinary level, and gradually filled up again to the working level when the feed cocks can be shifted to their original position. If frequent blowing off takes place the feed cocks ought to be so adjusted as not to require alteration, so long as the engines work at the same speed. If the water is allowed to get too high, priming will probably take place, and if it gets too low the plates and tubes will get overheated and injured, and an explosion may be the result.

Priming. Priming in a boiler is said to take place when, if we were speaking of a tea-kettle, we would say it boils over. The water gets mixed with the steam, and is carried out at the safety-valve and through into the cylinder, and if the engines are at work it impairs their useful effect and causes an undue dangerous strain on various parts, especially on the cylinder; and besides this, the boiler will be in danger of getting short of water, thereby causing the tubes and plates to become overheated and damaged. Consequently an explosion would probably be the result, the serious consequences of which it is impossible to estimate. Muddy water causes priming, and frequently when running out of one sort of water into another, priming goes on for a time. When serious priming takes place the stop-valve ought to be eased, besides all the other things necessary to be done, such as easing the fires, etc. The easing of the stop-valve is often much neglected, and is far more effectual than easing the throttle-valve, although both may often with advantage be done.

Blowing Off. The amount of blowing off will depend on the saltness of the water used for feeding the boilers and the amount of

water evaporated, and to what extent the brine or scum-cocks answer the purpose of keeping the water in the boiler at a proper density. The water should, as has been stated before, never be allowed to exceed twice the density of ordinary sea water—with surface condenser not so much even. The blowing off should be done at regular intervals, care being taken never to let the water get too low in the glass guage, and to blow down oftener when the vessel is in rough water, but not so low, as the motion of the ship is apt to roll the water off the tubes, etc.; therefore there is the more necessity to blow off frequently when there is not so much blown away each time. The blow-off cocks should be carefully seen to, and not allowed to get too slack, or leaks will take place, and if too tight difficulty may be experienced in shutting them; and if there should happen to be only one cock between the boiler and ship's bottom or ship's side, and that one stick fast when open, the consequences might be fatal. The only remedy is to draw the fires, and this might, if the ship were in a tideway or on a lee shore, be attended with serious results. However, no person who really knows the advantage of having two cocks between the ship's bottom or sides and the boiler, would send a vessel to sea if he could help it with only one cock, except those who are penny wise and pound foolish.

Harbour. When going into harbour the fires, if possible, ought to be allowed to burn down a little. In the first place, by so doing fuel is saved; and, secondly, the steam is not so likely to blow off strongly when the vessel is stopped. The fires, if possible, ought to be allowed to burn out, and should not be drawn; all smoke-box and fire doors ought to be kept shut, and the cold air should not be allowed to pass through the furnaces and tubes, as the sudden contraction is highly injurious, and causes leaky tubes, etc. If possible the tubes ought not to be swept for about twelve hours after coming into harbour; the water ought, if possible, to be allowed to cool in the boiler. Now all this, or a great part of it, we are prepared to be told is impracticable, on the ground that it is impossible to waste time with such precautions; but nevertheless we feel bound to state clearly that in a large number of cases these proper precautions for the benefit of the boiler can be taken if proper regulations were made and, of course, carried out. Those interested in the long life of a boiler would do well to insist, as far as possible, that the boiler be allowed to cool gradually; all sudden contraction weakens and shortens the life of the generator and reservoir of that mighty force, steam.

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YACHTING.

CONSIDERING the number and importance of the events to be dealt with in the present paper, the chronicler must needs abjure all prefatory matter and commence *in medias res*. We have already referred to the satisfactory settlement of the difficulty between Mr. Ashbury and the New York Yacht Club, whereby that gentleman has been enabled to seriously enter into arrangements for sailing a match, or matches, with a vessel or vessels selected by the above body for the cup won by the *America*. (Since we have such shrewd sea-lawyers to "sign articles" it is necessary to be precise of phrase.) Well, the matter has been stated formally and officially at a meeting of the New York Yacht Club as follows: "Whereas, at a meeting held March 24th, 1870, the New York Yacht Club acted according to their interpretation of the letter of trust devoting the *America's* cup to the care of the Club; and whereas, Mr. G. L. Schuyler, the sole survivor of the donors, published the original letter of trust, and fully expressed the view of the donors thereof, be it therefore resolved—That the New York Yacht Club hereby accept Mr. Schuyler's interpretation of the deed of trust, and that we will sail one or more representative vessels *against the same number of foreign challenging vessels*." The words which we have italicised express the condition which Mr. Ashbury so perseveringly—and for a long time fruitlessly—contended for. It is incumbent on the New York Club to find one vessel to pit against the *Livonia*, and one only.

The Americans, until Mr. Schuyler silenced them, held that Mr. Ashbury was bound to win the cup from a fleet of yachts, because in 1851 the *America* herself had won the trophy from an English fleet. All along we have been with Mr. Ashbury, but with regard to a point which he raised in a speech which he delivered (was it after dinner?) we are compelled by a simple reverence for what appears to us to be common justice to take an opposite view. He affirms that by virtue of his holding eight certificates from that number of Clubs he is entitled to sail eight matches for the cup right away! We trow not. Mr. Ashbury is the first challenger under the new regulations, and in the event of his being defeated he is bound by the laws affecting such matters, to make way for somebody else. Should there be no challenger forthcoming at the termination of the period assigned by the conditions for putting the prize up for competition—in this case six months—then, possibly,

the fact of his holding other certificates would entitle him to another effort. The absurdity of Mr. Ashbury's new claim is so palpable we are disposed to think that he made it either under the influence of the complimentary speech which had been made by the patriotic yachtsman who proposed his health, or else without giving the matter a moment's thought. Supposing the Americans granted the claim, and the *Livonia* were beaten in eight consecutive matches, does Mr. Ashbury imagine that six months after the eighth he would be eligible to begin again *de novo?* It may not have occurred to him that it is within the bounds of probability that there are other yachtsmen who, stimulated by his patriotic example, would like to have "a shy" at the Yankees on their own account. There are more yachts in the British fleet than the *Livonia*, and indeed it is believed by very competent authorities that at least two or three of those are better calculated than Ratsey's "experiment" to restore the *America's* cup to England. However Mr. Ashbury will doubtless think better of it. He has no occasion to fight against windmills. The match between England and America—that is to say, between the *Livonia* and a yacht selected by the New York Club, will afford him sufficient occupation of mind between this and the time of its consummation, which will either be in the autumn of the present year or the spring of next. We have had enough and to spare of newspaper warfare.

Mr. Pengelly, of Cornwall, is building Mr. Ashbury a yacht of fifteen tons which will be a total departure from ordinary yacht models. She will be 40 ft. on deck from fore part of stem to after part of stern post, and 10 ft. beam. The centres of gravity, of displacement or buoyancy, and of area of load water line are much farther forward than is usual; and the centre of her lateral resistance and centre of effort of sails coincide, just abaft the longitudinal centre of load-line. The greatest displacement being in the forward body, of course the greatest resistance will be there; but as the run off commences from the entry at the fore foot, the resistance being once overcome there will be an end of it, and she will not be hung up by the midship section. The displaced water will pass in a fair fore and aft direction; and although the bow is apparently full, it is not expected that any surge will accumulate there, thanks to her long and fine runs. The lines show no hollow, and the water-line of the half-breadth plan is the segment of a circle. The greatest breadth is amidships. The floor is flat, and when she is in proper trim the surface will be horizontal or parallel to the surface of the water. According to the *Field*, Mr. Ashbury intends, should this little yacht prove a success, to have one of forty tons built on the

same model. The name of the little yacht is the *Esthonia*, "after a Russian Baltic Province of which Livonia forms a portion."

One of the days at the latter end of May was distinguished by a match between a couple of well-known steam launches. This sort of contest is likely to become increasingly popular, and little wonder. Yachts are necessarily so much at the mercy of the wind in contests, that what on paper look interesting enough, are so frequently changed to dreary drifting matches (as they are flatteringly termed), that it is really somewhat surprising the idea of testing the speed of steam launches in the way most affected by Englishmen who have "the national spirit of sport in their blood," has not been thought of before. Mind, we do not altogether commend the practice. Steam would be apt to become a dangerous agent in, say, the hands of a frenzied engineman, "with something depending on the race." The stories told of the American river and lake steamers are not of an encouraging character. However, since the monetary issues of a match between two steam launches belonging to English gentlemen could scarcely ever be other than nominal, we cheerfully hasten to admit, that the fears which led to our making a passing reference to the mad races of American steamers are practically groundless. The match in question originated in a challenge of the *Ella* (Sir G. Clayton East, Bart.), to race all steam launches not over fifty-five feet long, that was responded to by the *Cicada* (Mr. W. E. C. Moens). The former launch was built by Forrest, and has always been considered the fastest craft of the kind on the Thames. Her engines were made by Messrs. Penn and Co. She is 49 ft. 6 in. long, 7 ft. 3 in. beam, and draws 3 ft. aft. She has a return tube boiler with two pairs of 5-inch cylinders driving twin screws, and on the occasion of the match the valves were screwed down to 90 lb. pressure. The *Cicada* is undoubtedly the most famous steam launch afloat. She is 49 ft. 10 in. between perpendiculars, 55 ft. over all, 9 ft. 3 in. beam, making about 20 tons builder's measurement; and draws 4 ft. 2 in. aft. She was built by Halliday, of East Cowes, and engined by Messrs. Day and Co., of Southampton. Her boiler is also a return tube one; two 9-inch cylinders with 9-inch stroke drive a four bladed screw, 3 ft. 6 in. diameter, with 5 ft. pitch. One valve was screwed down to 80, and the other to 60 lb. pressure for the match. The course was from Erith Pier round a boat moored off Gravesend and back, a distance of about twenty miles. Out against wind (east), and home on a slack tide. A start was made at six minutes past two, the *Ella* with 80 lb. of steam, and the *Cicada* with 60 lb. At one minute past three the *Cicada* rounded the buoy with

the flag on it, turning into the Gravesend side, just four minutes in front of the *Ella*, who turned to the Tilbury side, the pair having accomplished the distance from Erith Pier to Rosherville Pier in fifty-five and fifty-nine minutes respectively, against wind and tide. Eventually the *Cicada* passed the mark at Erith at 3 hrs. 46 min. 30 sec., and the *Ella* at 3 hrs. 56 min., making the former the winner by exactly nine minutes and a half. It is worth noting that the two owners did all the work of the engine-room in each vessel. By the bye, why should not steam launch matches form a regular feature in first-class regattas? For our part we see no objection to them, and much could be said in their favour. Even in river regattas like those of the Thames and the Tyne, such matches could be decided with great facility, and, to render nugatory an annoyance to rowers which is inseparable from steam launches (we mean "the swell"), such matches might form the final event on the card of each day. One abomination the launches would most certainly escape—the over-crowding and "wash" of over-laden steamers.

Halliday, of East Cowes, has established a name for a class of steam yachts which combine great speed and elegance: we predict an increasing popularity for the pretty little craft. He "made his mark" with the *Cicada*, and then, in consequence of the success of that vessel, he received an order for the *Fairy*, which is double the tonnage of the *Cicada* and quite fulfils the stipulation of her owner, namely, that she should run one knot per hour faster. These can, relatively speaking, be manipulated with as much ease as an eight-day clock; indeed, we have seen domestic timepieces (*not* by Bennett) far more difficult to wind up and regulate than a vessel upon which Halliday and the Southampton engineers, Messrs. Day and Co., had bestowed their skill. Both in the *Cicada* and the *Fairy* there is a small handle placed on each side of the tiller which enables the helmsman to stop or reverse the engines without any assistance from "below"—not that "below" is to be understood in the ordinary way when speaking of these beautiful vessels. The *Avalanche*, constructed at a cost of £5,000, proved a still further advance in the art of steam yacht building. We doubt whether this vessel can be surpassed in the essentials, whatever it may be possible to add to the craft of the future in the shape of adornment and "snugness." She is 112 tons b. m., and in accordance with the stipulations of the owners the builders have been enabled to get another knot an hour out of her, as compared with the *Fairy*. An enthusiastic description of the *Avalanche* recently appeared, and from that we extract the following particulars:—She may be described as an enlarged edition of her predecessors; with her sea-

going stores aboard, including 300 gallons of water and six days' fuel, she realises a trifle over the stipulated eleven knots, having, at the measured mile in Stokes' Bay, cleared eleven and a half knots, or thirteen and a quarter miles. Her engines are a pair of inverted, direct action, 52 h. p. nominal, but 150 h. p. indicated; diameter of cylinders, 18 in.; stroke of pistons, 15 in.; revolutions at full speed, 140 per minute. They are fitted with Oatridge's equilibrium slide valves; whilst the screw driven is 5 ft. 7 in. diameter, 11 ft. 2 in. pitch, has five blades, and leaves scarcely any vibration perceptible. Her boiler has brass tubes, returning over two furnaces to the smoke-box. Diameter of boiler, 8 ft. 7 in.; length, 9 ft. 2 in.; each furnace in clear diameter, 2 ft. 6 in.; number of tubes, 106; their outside diameter 3 in., and length 6 ft. 8 in.; heating surface of boiler, 658 square feet. The boiler was tested at 120 lb. per square inch, is practically worked at 60 lb. pressure, and is free from priming. To insure strength, lightness, and finish, steel and gun-metal are introduced in her engines wherever practicable, and not a pipe is visible. The steering wheel is amidships, and the helmsman while steering can manipulate the engines without communicating with an engineer. The *Avalanche* can be perfectly controlled by one man, and turned within her length. One turn of the wheel puts the helm hard up or down, and, moving a pointer upon a dial plate, shows the angle at which the tiller aft is standing; while the whole may be disconnected in less than a minute, so that the vessel may be steered aft in the ordinary manner and the engineer have exclusive control in his engine-room below.

One of the events we were unable to notice last month was the opening cruise of the Royal Northern Yacht Club, which took place on the 25th. The new cutter, *Garrion*, whose dimensions were given in a former number of this magazine, showed on the occasion, but was not yet in trim. Nevertheless she showed plenty of speed, and will doubtless fulfil all the expectations of her owner when the requisite alterations are made. A new 20-ton cutter, the *Zampa*, took part in the cruise. She has been built by Messrs. Connel, of Glasgow, for Mr. Forester; her most noteworthy points are great sheer and short and narrow counter. The *Leander*, a 20-ton cutter, recently launched by Reid, of Port Glasgow, was in Gowrock Bay. During the cruise a handicap match for a piece of plate was sailed, and won by the *Dinorah* yawl. From Scotland to the "Sister Isle" is but a step. By way of completing our record we may state that the channel match of the Royal Alfred Club, from Kingstown to Holyhead, was sailed on the 27th. There was a large entry, and

the match was won on time allowance by the Commodore's cutter, the *Torpid*, 28 tons. The three leading yachts throughout and at the finish were the *Enid* (yawl, 42 tons), Rear-Commodore; the *Xema* (cutter, 34 tons), Mr. W. H. S. Crawford; and the *Torpid*. On the following Monday a match was sailed from Holyhead to Kingstown, and won by the *Enid*, *Xema* taking second prize. The day subsequent to that the Ranelagh Club sailed a match from Erith to Gravesend and back, in a light wind, for two classes of prizes, when the *Dudu* (15 tons, Mr. E. Holloway) won the first prize in the first class; *Madge* (5½ tons, Mr. R. Stone) won the first prize in the second class; *Ripple* (9 tons, Mr. W. P. Davis) took the second prize in the first class; *Ellen* (4 tons, Mr. C. J. Gardner) won the second prize in the second class; and *Ethel* (4½ tons, Mr. W. T. Thompson) took the third prize in the same class. There was nothing about the Ulster Club's opening cruise—on the 27th of May—deserving of special note; and we may dismiss the Greenhithe Invitation Match by simply observing that the *Echo* (10 tons, Mr. J. A. Sparvel Bayley) won the first prize in the first class, and *Madge* the first in the second. The course was from Greenhithe round the Middle Blyth Buoy, and back. This disposes of some of the small fry; we now come to matches and yachts of more considerable calibre.

Monday, the 29th of May, was signalised by sailing the first and second class cutter matches of the Royal Thames Yacht Club, from Gravesend to the Nore Light and back. There was a good yachting breeze from the east, and otherwise the weather was all that could have been desired for such an important day. A most distinguished party was present on board the Commodore's steam yacht *Xantha*. Lord Alfred Paget had the honour of entertaining the Prince of Wales, Prince John of Glücksburg, Prince Vladimir of Russia, etc. Much interest attached to the first appearance of the new yacht *Alcyone*, thirty-nine tons, built by Hatcher for Lieut.-Col. Sir W. Topham; and to the *Foxhound* recently completed by Fyfe, of Fairlie (as previously mentioned in these pages), for the Marquis of Ailsa. The *Alcyone* fell very far short of the anticipations of her admirers, a circumstance to be in some measure accounted for by the "hitches" which seem inseparable from a first appearance—"on any stage." When the crew know her better, and her sails stand properly,—when the running gear and bolt ropes have ceased stretching, the cutter will probably do well enough. The *Volante* has undergone numerous alterations during the winter, all of which, judging from her behaviour in the matches in question, may be pronounced improvements. It was originally intended to run round

the Mouse Light, instead of that of the Nore, but shortly after two p.m., the ebb being almost done with, at the outer point a signal was made for the course to be shortened. Although by this arrangement the *Julia's* chance undoubtedly suffered, it was the most advisable under the circumstances, at least, so far as the enjoyment of the Commodore's guests was concerned. Eventually the *Vanguard*, 60 tons, Mr. W. Turner, arrived at Rosherville at 4h. 27m. 45sec. (the signal to start had been made at 11h. 12m.), and took the first prize in the first class; the *Volante*, 59 tons, Mr. H. C. Maudslay, winning the second. The *Foxhound* (who behaved splendidly, and won "golden opinions" from everybody, whereof let the Clyde take proud note) took the first prize in the second class. The prizes were presented to the respective winners by the Prince of Wales.

On the following day the New Thames Yacht Club sailed their first and second class matches in a light easterly wind, from Gravesend round the West Oaze Buoy, and back. Out of the ten that were entered there were seven, namely, the *Julia*, *Niobe*, *Foxhound*, *Alcyone*, *Vanguard*, *Volante*, and *Vampire*, that had sailed in the matches on the previous day. These included the winners of the Royal Thames Prizes. To make a long story short we may say that the match was practically a repetition of the former one, since the *Vanguard* won the leading prize, and the *Foxhound* the first prize in the second class; the *Vampire* taking the second prize in that class. In the Royal London Club match, which took place on the following day, and may be said to have concluded the regatta, the entries for the leading class were the same as in the New Thames, excepting that the *Gwendolin* schooner was substituted for the *Vanguard*. The course was from Erith round the Nore Light and return to Rosherville. A fresh easterly wind prevailed when the signal was made at 11h. 50m. for the second class yachts to get under way, the vessels of the larger class being started at noon. The match was distinguished by the disasters which befel the *Julia* and *Thought* (whereby the former vessel had a good deal of her chance destroyed, and the latter was "put out of it" when she looked all over a winner), and the splendid sailing of the *Foxhound*. The balloon jib of the *Julia* proving too much for the bowsprit, the spar broke off about 8 ft. outboard, and so lost her lead at a critical part of the race. When halfway through the Lower Hope, the *Thought*, standing out from the south shore on the starboard tack, met a barge standing on the port tack, the *Thought* at that time shifting topsails for a jib-header. According to the rule of the road the barge should have given way, but, no thank you!

The bargee, true to his traditional character for politeness, held on, and poked his bowsprit through the *Thought's* jib. So Mr. Wells had to console himself for the loss of the prize, which was then within his grasp, with the name of the offending bargee, and the more or less problematical prospect of punishing that amiable ruffian. The *Julia* did come in first after all, but the beautiful little *Foxhound* getting second won the prize through the time allowance she received, and so brilliantly crowned her week's remarkable exploits. In this match the *Alcyone* behaved better than she had in either of the others, and encouraged both owner and builder in the hope that she will yet prove worthy of the high anticipations of her speed and seagoing qualities, which were rife in yachting circles before she was launched. She won the second prize in this match. The times were:—*Julia*, 6h. 11m. 2s.; *Foxhound*, 6h. 23m. 10s.; *Alcyone*, 6h. 25m. 45s.; *Niobe*, 6h. 26m. 46s.; *Volante*, 6h. 27m. 32s.; *Vampire*, 6h. 40m. 46s.; *Thought*, 6h. 41m. 45s.; and *Lizzie*, 6h. 42m. 3s. The *Vampire* won the first, and the *Lizzie* the second prize in the second class match.

The New Thames Yacht Club match on Thursday, June 8th, was shorn of a good deal of the interest that would have belonged to it had the *Egeria* been amongst the competing vessels; but as she in beating round from Dover had carried away both bowsprit shrouds she was unable to put in an appearance, and the only vessel qualified to test the *Livonia* for speed was the *Gloriana*. The course was from Harwich to Gravesend, leaving the Cork Light, the Rough and West Rocks Buoys, and the Gunfleet Light on the starboard hand, the Swin Middle Light on the port hand, and all the marks on the Maplin Sands on the starboard hand. The signal for starting was given at 8h. 30m., and the match finished—so far as the four leading yachts were concerned, thus:—*Livonia*, 2h. 1m. 30s.; *Gloriana*, 2h. 9m. 8s.; *Rose of Devon*, 2h. 18m.; and *Julia*, 2h. 19m. 9s. It is scarcely necessary to devote any space to a description of the race. The *Livonia* sailed the course (wind strong N.N.W.), sixty seven miles in five hours and a half, or at the rate of twelve miles an hour, sixty of those miles with the flood. It was a fairly satisfactory performance, nothing more. She will have to improve upon this, or the Yankees will beat her when she tries conclusions for the *America's* cup next October. She virtually won the match of the Royal Harwich Yacht Club, the *Gwendolin* (182 tons, Major Ewing) carrying her jib at the point of the race when Mr. Ashbury's chance of an easy victory appeared in jeopardy, but since the *Livonia* had not started properly the prize went to Major Ewing's vessel. The regatta of the same club was held in very coarse weather, and we

regret to say was marred by a fatal accident to one of the extra hands of the *Volante*, who was crushed to death. She made a sudden gybe and carried away her boom, and the loose part of this flying inboard caused the accident. This was during the cutters' match. There were three entries, including the *Foxhound*, and a start was made at 11h. 19m. in a strong wind N. by W., each yacht having a pair of reefs down and second jibs set. The finish was as follows:—*Niobe*, 2h. 42m. 58s.; *Foxhound*, 2h. 47m. 15s. The match for schooners and yawls (two entries) was won by the *Flying Cloud;* and that for cutters of twenty-five tons by the *Lizzie*, the *Vampire* taking the second prize.

On Wednesday, the 14th of June, there were four entries for the New Thames Yacht Club prizes of £100 and £50, namely, the *Livonia*, *Egeria*, *Gloriana*, and *Flying Cloud*. The wind was S.W., and not too much of it. Nearly four tons of iron ballast had been taken out of the *Livonia*, and "all hands," including of course builder and owner, were on the *qui vive* for the result. It was, owing to the wind having fallen, little more than a drifting match during the homeward half of the voyage, and of this the *Livonia* the best, winning the match, thus: *Livonia* 7h. 7m. 51sec.; (they were started at 11 h. 52 m., on the top of high water), and *Egeria* 7 h. 40 m. 11 sec. This was the most hopeful effort which Mr. Ashbury's schooner had made. Lightening her was obviously an improvement. Neither in the schooner race of the Royal London, nor the match of the Royal Thames Yacht Club did the *Livonia* distinguish herself. A writer in a contemporary—one of the yacht's firmest friends hitherto, by the way—was moved to say in reference to her ignoble performance in the former match,—"If she does not do better, and approach in her speed and weatherliness the high opinions every one has formed of her, she is the most wonderful failure in her line that has yet been built."

In each match the wind was light. The *Egeria* (142 tons, Mr. Mulholland) won the first schooner prize, and the *Flying Cloud* the second of the Royal London Club. The *Livonia* was simply "nowhere!" The *Druid* won the yawl prize. The *Egeria* won the first prize, and the *Gloriana* the second of the Royal Thames Club, Mr. Ashbury's schooner finishing a barren second, in consequence of the time allowance to Mr. Wilkinson's yacht.

On Friday, the 16th of June, the most important match that has yet been decided took place, under the auspices of the Royal Thames Yacht Club. There was a strong entry including all the principal yachts afloat. Eight o'clock was the hour appointed for the fleet to be at their stations at the Nore, but it was simply a

dead calm just then, and there was nothing for it but to wait. In making the course to Dover the West Oaze Buoy was to be left on the port hand, the east buoy of the Shivering Sand on the starboard hand, outside the Goodwins, leaving the North and South Sand Head Lights on the starboard hand, thence to Dover, then passing between a flagboat and the Admiralty Pier. Schooners were allowed to set mainsails and foresails, and cutters, mainsails, prior to the start. At 10.45 a gentle breeze came out from E.S.E. and the signal was given to start. The wind freshened in the next half-hour but very little, and thus early in the race, at all events, the least possible interest attached to the progress of the semi-becalmed, or more or less drifting fleet. Later the match became more interesting, no thanks to the *Livonia*, who was never formidable, and eventually the *Guinevere* (294 tons, Capt. Thellusson) won the first prize, and the *Egeria* the second. It was considered that the victory of the *Egeria* was owing to good judgment and seamanship, Mr. Mulholland's yacht having displayed better sailing qualities. On the following Monday the match from Dover to Boulogne was sailed and won by the *Guinevere;* but herein Mr. Ashbury's schooner, which finished second, once more raised the hopes of her friends. Captain Thellusson went the shorter course to Boulogne, consequently it was impossible in this match to measure the *Livonia* through the *Guinevere*. Once again, Mr. Ashbury's schooner sailed well.

We understand that the American schooner *Enchantress* has gone into harbour at Cowes, to be refitted by Ratsey. The same builder is making rapid progress with a fine little cutter of 55 tons, which he has just laid down for M. Benoit Champy. She is of the following dimensions: length between perpendiculars, 65 ft.; beam, 14 ft.; draught of water aft 10 ft. 6 in.; ditto forward, 7 ft.

SOCIETIES.

MEETINGS, ETC.

Royal United Service Institution.—On Monday, the 5th of June, a paper was read on "Ocean Currents," by J. R. Laughton, Esq., Mathematical and Naval Instructor, Royal Naval College, Portsmouth. The author with the view of clearly establishing what he alluded to as ocean currents, stated that he meant ex-

clusively those movements of the water, whether in the upper part of the sea or at a considerable depth, which have an appreciable, and to a certain extent regular, onward motion. Tidal currents, storm currents, and other such irregular and exceptional movements were not to be included in his remarks. He then alluded to the various well-known currents which affect navigation, or influence climate; traced by numerous comparisons of a ship's position as found by sights with that shown by dead reckoning; traced by the drift of icebergs, wreck, drift-wood, or of bottles, whose several directions and velocities have been now pretty accurately determined, and are laid down—more or less correctly—on most physical maps.

But with regard to the supposed existence of an extensive system of under currents in no way connected with those at the surface, he did not think there was sufficient proof to establish the fact that there are such currents in the open ocean; for although some observations have been described as made with rather startling results, it does not appear that in these sufficient care was taken to eliminate the many sources of error to which an experiment so complicated is liable.

The theory of a great system of oceanic circulation, by which heavy cold water from the poles is supposed to set underneath towards the equator, and warmer water above towards the poles, Mr. Laughton shewed could not account for the existence of strong under currents, because the forces which are supposed to set this circulation in motion are not sufficient to produce any appreciable effect, but being continued for centuries may and possibly do cause the dense water from the poles slowly to permeate and transfuse itself under and amongst the lower strata of the whole ocean, thus accounting for the very low temperature at great depths. He then stated that the remarkable analogy and correspondence which we everywhere find between the principal currents of the ocean and the prevailing winds of the several localities, immediately suggests the possibility of a very close connection between them, of a relationship of cause and effect. That this relationship actually exists, that the principal currents are distinctly caused by the prevailing winds, is an opinion very widely held, and it seemed to him that, in its minutest detail, the evidence on which this opinion rests is incontrovertible.

It is well known that in each of the large oceanic basins there is, within the tropics, a permanent set from east to west, in the direction of the trade winds, which is spoken of as the equatorial current, and, on the other hand, in the temperate zone, or region of westerly

winds, there is an east-going set, which is the easterly drift of the several localities.

Where, however, land obstructs the passage, whether of the easterly drifts or of the equatorial currents, very great changes take place, not only in their direction, but in their character; and it is these changes which are most commonly referred to as evidence tending to impugn the effect attributed to the prevailing winds. The author asserted that northerly or southerly currents along coasts which run in a northerly and southerly direction, may very well be simply the divergence of westerly or easterly currents striking against these coast lines, and may distinctly owe their origin to easterly or westerly winds. Again, these currents set in motion by the prevailing winds create a constant indraught behind them, and this indraught strengthens the current and increases its velocity. There is thus, in every oceanic basin, a clear and distinct circulation of the water, formed by acknowledged, well-known, and easily traced currents; but this circulation is in the plane of the surface of the ocean, it is *horizontal* not *vertical*.

The author then referred to the diversity of opinion which exists on this subject, and with reference to the argument that the influence of wind blowing on the surface of the water could not possibly reach to any depth worth speaking of, he stated that no satisfactory measurements had ever been made of the depth of the purely drift currents, and stream currents are so modified by the pressure induced by lines of coast that their depth, velocity, and direction, seem almost independent of the winds to which they owe their origin. A rough estimate, founded on the velocity of certain icebergs and their probable draught of water, gave the depth of the eastward drift current across the Atlantic as about seventy-five fathoms; and one observation taken by Sir Edward Belcher, of the North African current, shewed that at a depth of five hundred fathoms it was flowing with the same velocity as at the surface. It may therefore be fairly assumed that the depth of these drift currents is much greater than has been commonly attributed to them.

In allusion to the Natal current which rushes past the south-east coast of Africa with tremendous velocity, on which Dr. Carpenter founded his statement that there is in the Southern Ocean a general set of warm surface water towards the Pole, the author believed that the explanation which will commend itself to every geographer, is that given by the conformation of the land, which, by preventing the escape of the water of the equatorial drift to the northward, compels the whole of it to turn towards the south; so

that, more especially when the north-east monsoon is blowing to the north of the line, and in the Mozambique Channel, the whole drift of the Indian Ocean is pent up against the African coast, and forced into this Natal current, which thus attains its greatest development in the southern summer, when it stretches sometimes far to the southward, and even westward of the Cape of Good Hope, bearing back in its course some part of the easterly drift.

He dwelt at some length upon the Red Sea current, which he regarded as resulting directly from the monsoons of the Indian Ocean outside, which during the winter months formed an inward current through the Straits of Bab-el-Mandeb and an outward current during the summer months. He did not agree with the theory of Captain Maury recently repeated by Dr. Carpenter as to the great evaporation of the Red Sea causing a permanent inward current above, and a permanent under-current to carry off the salt.

A somewhat similar theory had been put forward with regard to the Bosphorus and Dardanelles, only in this case the differences of specific gravity seemed to point to the necessity for a permanent under-current inwards to keep up the supply of salt, but actual investigation had shewn no trace whatever of any such under-current.

With regard to the current through the Straits of Gibraltar into the Mediterranean, the author disagreed entirely with Dr. Carpenter's theory of evaporation, and he conceived it to be simply a stream formed by the easterly drift of the North Atlantic, which, although it forms a southerly current on the coast of Portugal, is still strongly pressed to the eastward, and seeks the first escape it can find. So great, indeed, does this pressure seem to be, that more water is forced through the Straits than the Mediterranean can receive, and a part of it is ejected in reverse currents, some as lateral currents on the surface, some, it appears, as an under-current at a considerable depth, and any under-current which flows outwards through the Straits of Gibraltar he believed to be principally caused by what is called an "undertow," *i.e.*, when a strong surface-current is established setting dead on to a steep shore, it recoils from that shore, not laterally, for the strong set on the surface prevents it, but underneath, and such an undertow he considered was formed by the escape of water corresponding to the excess which, on the surface, is *driven* into the Mediterranean.

Reference was made to the formation of the Gulf Stream, the depth, velocity, and direction of which are caused by the configuration of the land which interferes with the even progress of the Equatorial current. Driven in vast quantities into the Gulf of

Mexico, the water seeks an egress through the Straits of Florida, the pressure from behind drives the hot water downwards as it meets the constraint of the narrow passage; the velocity is at the same time increased enormously, so that the water occasionally rushes through the Straits in eddies and whirls, and in violent turmoil, more like a mill race than a broad and mighty stream.

When turned by the coasts of Newfoundland the stream is forced into the easterly drift, and with augmented volume and velocity rushes across to the shores of Europe. From fairly reliable data it is estimated that the quantity of water passing through the Straits of Florida daily amounts to upwards of six hundred cubic miles, and it is this continual daily influx of six hundred cubic miles of hot water into the North Atlantic; the continual sweeping away of this hot water towards the shores of Europe; the spreading of it out over a large area, and the gradual dispersion of its heat into the air which, as a west or south-west wind, bears it eastward; it is the combination of these several modes of action to which the climatic influence of the Gulf Stream is attributed, and any considerable change in its direction or decrease in its volume might produce a very serious effect on our climate.

In conclusion, he alluded to the proposal of Captain Silas Bent, to cut a canal through the Isthmus of Panama, and thus divert into the Pacific the waters that run from the Gulf Stream. He considered that if the scheme were carried out the results would be ruinous to our country, but having regard to the stupendous difficulties in the way, and the immense quantity of capital required, it was scarcely necessary to say that the project is as visionary as though Captain Bent had been a native of Laputa.

Royal Geographical Society.—The thirteenth meeting of the present Session was held on Monday evening, the 12th of June, 1871, Major-General Sir Henry C. Rawlinson, K.C.B., President, in the Chair.

The paper read was on "An Excursion into Hadramaut, Southern Arabia," by Captain Miles (Political Resident at Aden) and Mr. Werner Munzinger. The journals of these gentlemen had been adapted for reading, on this occasion, by the Rev. G. P. Badger, who added explanatory remarks. The country, together with Yemen, for several centuries before and after the Christian era, was one of great natural wealth; in the most ancient times the people and their princes were known under the name of Sabeans, and at a later date as Himyarites. In addition to the natural riches of their country, among which gold was included, the inhabitants

obtained wealth by their extensive commerce with all the civilized countries of those days. In modern times the region had been almost totally neglected by travellers. Sanâà, an ancient city of the interior, had been visited, in 1836, by Cruttenden, of the late Indian Navy. But previous to him nearly all our modern information was derived from Niebuhr. The coast had been well surveyed by the officers of the Indian Navy, who occasionally made short excursions inland. Lieutenant Wellsted and Baron de Wrede, both able travellers, had visited part of the region now opened up by Capt. Miles and Mr. Munzinger. These gentlemen left Aden in July, 1870, by steamer, and landing at Bir Ali, about 220 miles to the east, struck for the interior, and passed by Nakab el Hajar, Kail, Shaah, and other places, returning to Aden by land. They found much cultivation near the Arab villages, but were not well received in some of the places, the intercession of their guides alone saving them from pillage or worse. Numerous ruins which stud the country were visited, and the Himyaritic inscriptions copied or brought away. The country consists of a series of table-lands rising from the coast towards the interior, and intersected by wadys, or dry valleys.

After the conclusion of the paper, the President gave some further historical details regarding South-Eastern Arabia. It attained a high degree of civilization, wealth, and importance, long before the Christian era, and it was remarkable that the country, or portions of it, were often governed by queens. He reminded his hearers of the Queen of Sheba, as a familiar instance. The Himyaritic inscriptions that have been brought to Europe and translated, are many hundreds in number, but they do not convey much historical information, being generally votive tablets of private individuals. They could not be of later date than the second century of our era.

Shipwrecked Fishermen and Mariners' Royal Benevolent Society.—The thirty-second annual meeting of this national and philanthropic institution, incorporated by Act of Parliament, and supported by voluntary contributions, to assist destitute persons cast away upon our coasts, was held at the Mansion House on the 26th May, the Right Hon. the Lord Mayor, Vice-President of the society, in the chair.

It appeared from the Report that during the past year the society had relieved 5738 shipwrecked persons, natives and foreigners, and 3937 widows and orphans of fishermen and mariners, making a total, since the formation of the society in 1839, of 203,787!

that 48,258 mariners voluntarily subscribe 3s. each per annum; that the income had been £22,668, in connection with which certain large donors were mentioned, among whom may be mentioned Her Most Gracious Majesty the Queen, £25 (annual).

In order to encourage gallant efforts to save life on the high seas and coasts of our colonies, the committee had awarded during the past year one silver medal, and £5 for saving the lives of ship-wrecked persons; making a total of 34 gold and 233 silver medals and £961 5s., for the saving of 5687 persons since 1861!

Several legacies were announced during the past year, and in the report the committee drew the attention of their friends to the Royal Alfred Aged Merchant Seamen's Institution, established through the medium of this society, at Belvedere-on-Thames, and opened for the reception of destitute aged merchant seamen, in January, 1867. They rejoice to say, that eighty poor men are happily lodged within its walls, and that sixty having wives are receiving small out-pensions to help them in their declining years. They again revert to the fact that our merchant seamen are *wholly uncared for* by the Government, and until this society, in fulfilment of part of its mission for which it is incorporated, founded this institution, they had no refuge but the workhouse, or dragging out their lives amid scenes and sufferings more degrading; and yet no reflecting mind doubts that these are the men, as a body, who, under God, have been the means by which England's greatness has been built up and maintained, and who hold in their hands still her safe keeping from a hostile invader.

The society circulate 9500 copies of a little quarterly periodical, the *Shipwrecked Mariner*. Much instructive matter is to be found in it, and the committee solicit their friends to help its circulation.

The report concluded by drawing attention to the fact that 9675 persons suffering from the perils of the deep during the last year, have, through the blessing of God and the benevolence of the supporters of the charity, had their sufferings materially alleviated.

Various resolutions having been moved and seconded, the meeting separated after the usual vote of thanks to the chairman.

NOTICES OF BOOKS.

Reports of the Committee for the purpose of promoting the Extension, Improvement, and Harmonic Analysis of Tidal Observations.

We much fear that when the investigation of a great theory is

entrusted to a committee, and the members of that committee are widely dispersed, that the "heat and burden" of the labour falls on one or two, and in the case of these two reports on tidal investigations, we might almost write Sir William Thomson instead of the Committee.

That the philosophical investigation of the tidal phenomena is a desideratum no one will venture to deny, and the more deeply we can become versed in the cause and effect of those subtle and at present inexplicable variations that seem almost the result of accident or chance, but for their regularity, the more the mind will expand to the greatness of the subject it has to deal with. At the same time for practical navigation we must not consider it an absolute necessity, as from mere local circumstances, such as the prevalence of wind in a certain direction, or a heavy fall of rain, all the minute differences vanish, and all calculations fail. The great value of the knowledge of the diurnal or semi-diurnal inequalities may therefore, practically speaking, be considered local, its utility in crossing a bar or docking a ship is indisputable; but to that local knowledge another knowledge is indispensable, viz., that of effects of certain winds, freshets, etc., to which we have alluded, and the pilot or harbour master that is perfectly acquainted with the theory of the tides would only know one half his business, and would probably break a ship's back or lose an advantage for want of the other; so as long as this deep investigation is not insisted on as a necessity to seamen we cannot say it can be carried too far.

A carefully prepared diagram of a month's tidal observations at Kurrachee is appended, which in itself gives a very good idea of the tidal variations at that place, but it must be remembered that the position of Kurrachee, at one of the mouths of the great river Indus is not a very favourable locality for observing for the establishment of a theoretical principle, but even there it will be seen how accurately the tidal curve as calculated from the theory of Lubbock, and adopted by the Admiralty, passes midway between the heights of high and low water, fully corrected for diurnal inequality, as computed from the systems of Sir William Thomson and Mr. Parkes.

The computation of these tidal investigations has been entrusted to Mr. E. Roberts, of the Nautical Almanac Office, and we may emphatically say, from the care and exactness apparent in every part of them, they could not be in better hands.

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COLLISIONS AT SEA.

Reward offered for the simplest and best Mast Head and Side Lights.

To the Editor of the Nautical Magazine.

London, 21st June, 1871.

Sir,—It frequently happens that questions arise whether the lanthorns usually supplied to British merchant ships, for their mast head lights and coloured side lights, are so constructed as to throw those lights for the distance and in the manner prescribed by the "Regulations for the prevention of Collisions at Sea." That these lights should be such as to comply with those regulations is a matter of no small importance to the seafaring community.

There is not much difficulty with the colourless mast head light, and as regards the *red* side light experiments recently made over measured ranges at Shoeburyness, lead to the conclusion that a roomy lanthorn of the usual pattern, when fitted with a proper burner or burners, and with reflectors and plano-convex or dioptric lenses, will on a dark night with a clear atmosphere, throw a light for a distance of two miles.

The green light presents the greatest difficulty, and it appears that no ship's lanthorn yet tried at Shoeburyness has been found capable of throwing a *green* side light two miles over an arc of ten points of the compass. An efficient lanthorn for the starboard side light has therefore yet to be submitted.

With a view to calling attention to this point, it occurred to me that a small reward might be given to the maker of the simplest and best of the ship's lanthorns that may for a time be submitted for trial at Shoeburyness, and with that object I made application to a few shipowners as to raising the necessary funds. I am already promised £35, and I wish to raise the sum to at least £100.

In the case of lanthorns for the red light that have been successful at trials, the lenses have been *bona fide* dioptric or plano-convex (and not mere segments of glass of a uniform or nearly uniform thickness throughout, like coloured pieces of a fish globe), and the wick where oil is burnt and the wick is single has not been less than $1\frac{3}{8}$-inch, and in the case of two wicks in one lanthorn, each wick has not been less than one inch. The reflectors have also been carefully planned.

The lanthorn for the green light must be capable of containing a lamp or lamps giving out more power than the lanthorn for the red light, and the lens should be a blue green rather than a yellow green.

The mast head light is required to shew a uniform and unbroken

light for five miles, over twenty points of the compass; and the coloured side lights are required to shew a uniform and unbroken light for two miles over ten points of the compass.

Simplicity no less than efficiency should be aimed at by all makers submitting lamps for trial. If the lanthorns of two makers prove to be equally efficient in power, then the reward will be given for those lanthorns having greater merit as regards simplicity. If the best mast head light is also submitted by the maker of the best side lights, then the whole sum will be given to the one maker, otherwise it will be apportioned so that the maker of the mast head light shall get one third, and the maker of the side lights two-thirds.

In order to obtain the money in my hands, the lanthorns must be such as will comply with the regulations and the instructions as to lights, of which copies can always be obtained free of cost on application by letter addressed to the Board of Trade.

The reward herein referred to is not offered by the Government, but by a few shipowners who have agreed to place it in my hands.

All lanthorns intended to be submitted for trial at Shoeburyness should be sent to me at the Board of Trade as usual, accompanied by the usual printed form filled up by the maker.

I shall be obliged if you will kindly insert this letter with the view of bringing the subject to the notice of those interested.

Yours faithfully,

THOMAS GRAY.

P.S.—The following particulars may be useful to makers as an indication of the dimensions of lanthorns that generally pass inspection satisfactorily for side lights.

"As far as possible to ensure uniformity, and especially to guard against lanthorns being condemned at one port after they have been passed at another, the Board think it right to point out that—

(*a.*) If the coloured lens of any lanthorn to be used for a side light is not less than the third of a circle;

(*b.*) If the chord of the arc made by the lens is not less than eight inches;

(*c.*) If the lens is not less than five inches in height;

(*d.*) If the back and side of the lanthorn are not less than nine inches, and if the height of the lanthorn inside is not less than eleven inches, exclusive of the chimney;

(*e.*) If the lanthorn is sufficient in all other respects, and is properly constructed, fitted, and arranged;

Then the surveyor need not hesitate to pass it, and in making his measurements he need not be particular to the eighth part of an inch, more or less."

T. G.

MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
39	Ireland—Lough Foyle—Inishowen Lights.	Alteration.
40	Tierra del Fuego—Beagle Channel	Establishment of a Mission Station.
41	Mediterranean—Alexandria. " Rosetta Light.	Commencement of building Breakwater. Period of revolution.
42	Madeira—Funchal Bay.	Position of wreck.

NAUTICAL NOTICES.

(All bearings are Magnetic.)

39.—*Ireland—Lough Foyle—Inishowen Lights.*—The west lighthouse has been increased in height 25 feet, and on August 1st a *fixed white* light will be exhibited from it. A sector of *red* light will also be shewn from the same tower 25 feet below the fixed white light, it will be seen over the north-west end of the Tuns bank.

The low distinguishing light in the east tower will, at the same time, be discontinued.

40.—*Tierra del Fuego—Beagle Channel.*—A mission station has been established on the north shore of Beagle channel, N. by E. from the entrance to Ponsonby sand, and which may be used as a place of refuge and relief to mariners shipwrecked in the vicinity of Cape Horn. The position of this station is in lat. 54° 53′ S. long. 68° 12′ W.

41. *Mediterranean—Egypt—Alexandria.*—The works of the outer breakwater have been commenced. It will extend from the red buoy lying N. ¼ W. eight cables from the ruined palace at Mux to the Abubàkàr rock, and from that rock three cables towards the lighthouse. Vessels must not attempt to cross the line of the breakwater.

Mediterranean—Egypt—Rosetta light.—The red and white light revolves *every ten seconds.*

42. *Madeira—Funchal Bay.*—The exact position of the wreck of which notice has been given is S. ¼ W., about three and a half cables from the east end of Loo rock in 22 fathoms.

Note.—As the anchors of several vessels have been lost by fouling the wreck, and the red buoy marking it is not always in position, mariners are cautioned.

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, IN JUNE, 1871.

No.	Inches.		s.	d.
1887	m = 0·52	North Sea, Jutland and Schleswig:—Eider river to Blaavand point	2	6
131	m = 6·0	Japan, Inland Sea:—Kurusima No Seto and adjacent channels	1	6
119	m = 2·0	Japan, Inland Sea:—The Naruto passage	1	6
734	m = 2·0	Red Sea:—Suez bay	2	6
2091	m = 0·3	Africa:—Table bay to Donkin bay	2	6
1341	m = 30·0	Peru:—Port Mollendo	1	0
331	m = 0·98	United States, Georgia;—Wassaw, Ossabaw, St. Catharines, and Sapelo sounds	2	6

HYDROGRAPHIC.

CHINA.—PE-CHILI STRAIT AND LINSCHOTEN ISLANDS.

The following information relative to a shoal on the southern shore of Pe-chili strait, and a reef amongst the Linschoten islands, has been extracted from the official Netherland Magazine.

[*All Bearings are Magnetic. Variation* 3° *Westerly in* 1871.]

The Prussian man-of-war *Arcona* on a passage from Wusung to the Pei-ho, when about 9 miles to the eastward of Chi-fu harbour on the southern shore of Pe-chili strait, observed a shoal apparently about one mile long, on which 4½ fathoms were obtained. From the shoal North rock bore W. by N. ¼ N., South-east island W. by S. ½ S., and White rock S. by W. ¼ W.

According to these bearings, the shoal is in lat. 37° 35′ 40″ N., and long. 121° 41′ 40″ E.

LINSCHOTEN ISLANDS.—The Commander of the Netherland war steamer *Medusa*, during a passage from Nagasaki to Yokohama, observed a reef about 2 miles in extent north and south, indicated by discoloration of the waters and high breakers, lying about 8 miles to the northward of Firase or Blake reef in Colnett Strait, Linschoten islands. It lies in lat. 30° 13′ N., and long. 130° 40′ E.

BAY OF BENGAL.—NICOBAR ISLANDS AND MERGUI ARCHIPELAGO.

Rear-Admiral J. H. Cockburn, Commander in Chief in the East Indies, has transmitted the following information by Navigating Lieutenants John Phillips and W. H. Hayward, of H.M. ships

Forte and *Dryad*, relating to the Nicobar islands and Mergu archipelago, 1871.

[*All Bearings are Magnetic. Variation* 1° 45′ *Easterly in* 1871.]

Car Nicobar, the northernmost island of the Nicobar group, is about 7 miles long north-east and south-west, and 6 miles broad. The south and south-east ends are moderately high, the north end being low, but in no place less than 60 feet above the sea. The island is thickly covered with jungle.

Anchorage.—There is anchorage all round the island, but in rather deep water except in the bay on the north-west side, known as Saoui bay, where vessels may anchor in from 12 to 14 fathoms, rock and coral with a light surface of sand.

The principal village, named Moose, is situated on the east side of Saoui bay, near the north end of the island; there is good landing for boats at low water during the north-east monsoon at the village, in a cove immediately under the flagstaff recently erected on De Roepstorff bluff; at high water the landing is indifferent.

Tides.—There are regular tides in Saoui bay, the flood running to the eastward.

Nancowry Harbour.—This harbour, formed between the islands of Nancowry and Camorta, is commodious and sheltered from all winds. It has two narrow entrances, one from the east and the other from the west, and can therefore be entered or left without difficulty in either monsoon.

Buoys.—The eastern entrance is marked by two buoys; a white buoy marks the north-east extreme of the reef off the village of Alla Coango, and a black buoy, with staff and two balls, is placed outside the southern edge of the reef, extending off Naval point. The western entrance is narrower than the eastern, but has the advantage of all dangers being visible.

Directions.—In coming from the southward and westward, and with the south-east point of Katschal island bearing N. by E., Mount Edgecumbe the highest and southern part of Camorta island forming the north side of the entrance to the harbour will be seen. Upon opening Mount Edgecumbe, the south side of the entrance is marked by a detached rock, resembling a dog's head, having steep sides and a bushy top, with rocks apparently extending off it.

A vessel should pass midway between Indian and Man points, then steer N.E. by N. up the harbour, edging to the northward as point Leda is approached, until Naval point bears E.N.E. when the

latter may be steered for. This will lead midway between the reefs off Alfred and Leda points, and on to the anchorage off the settlement, which latter is on the Camorta side, between Naval and Battery points.

A wooden pier about 700 ft. long is being built at the settlement and is already about two-thirds finished.

Great Nicobar is the southernmost island of the Nicobar group; at its south end is Galathea bay, a deep indentation of two or three miles in extent, where there is fair anchorage during the north-east monsoon in from nine to sixteen fathoms.

Upon passing the south or Parson point, off which the surf breaks heavily, a remarkably flat island named Walker will be seen on the west side of the bay, resembling a fort with sentries posted round. The only landing place bears from Walker island, N.E. by E. $\frac{1}{2}$ E. and is on coral slightly fringed with sand, between two reefs.

Tides and Currents.—When in the immediate vicinity of the Nicobar islands, a ship will be influenced by the tides, the flood setting to the eastward. In the offing the currents, as affected by the prevailing monsoon, will be experienced, but they are uncertain in strength, and irregular in direction.

MERGUI ARCHIPELAGO.—*Cabosa* is the northernmost island of the outer group, and has a small islet on its north side. It is of moderate height and thickly covered with jungle.

About midway between it and Tanasserim island (the next large island to the southward) and nearly five miles east of the western Canister, a small steep high island densely covered with jungle, is a group of pinnacle rocks above water.

Freak Island is low with only a few scraggy trees on it, and surrounded by rocks. A line, joining this island with the western Canister, passes to the southward of the above-mentioned group of pinnacle rocks.

Brown Rock, lying about 18 miles E. by S. from Cabosa and from 8 to 9 miles S.S.W. of the small Canister, shows well above high water. No dangers are visible between it and Freak island.

Iron Island lies to the south-east of the small Canister; the depth of water along its eastern side, at a distance of about 2 miles off the shore, is from 14 to 18 fathoms.

Lord Loughborough Island, in latitude 10° 25′ N., longitude 97° 57′ E., is about 7 miles long and 3 broad, high and steep-to. Three quarters of a mile from the shore, on the north-east side, the soundings are from 17 to 19 fathoms. Nearly abreast of the eastern

point, and half a mile from the shore, is Hayward island, with rocks showing a short distance off; these rocks are steep-to, and there is good anchorage off this island in 17 fathoms, clay.

Between Loughborough and Richard islands there is good anchorage in from 8 to 15 fathoms, mud. Through the channel separating these islands, 3 fathoms will be found close to the shore, on either side.

To the eastward of Richard island are three other islands, O'Connor, Saul, and Skinner; the northern of which, O'Connor island, alone appears in the charts. They are of irregular form, about the same size, and are said to be dangerous to approach from sunken rocks between and about them. Vessels passing between these islands and Richard island, should keep the latter on board.

Bird's Nest Island is said to be much narrower than shown on the chart.

St. Andrew Group—Cockburn Islands.—The three islands to the northward of C. island are in one upon a S. $\frac{3}{4}$ W. bearing; they are a mile to the southward of the position assigned them in the chart. The island as shown between them and F., on the chart, does not exist; but there is a dangerous rock, not marked, named Parson rock, dry at low water, from which North Cockburn island bears W. $\frac{1}{2}$ S., and the north point of C. island, S.W. by S. The east point of Bird's Nest Island, bearing north, or a conspicuous round island covered with jungle, off the east side of C. island bearing south, clears Parson rock to the westward.

The Tides in the different channels of the Mergui archipelago run east and west, the flood setting to the eastward.

Otago Harbour.

The following additional information respecting Otago harbour has been received from the Harbour Office at Port Chalmers.

[*All bearings are Magnetic. Variation* 16° 25′ *Easterly in* 1871.]

The channel across the bar at the entrance of Otago harbour having gradually regained the deeper water it had before the great tidal wave of August, 1868, caused it to shoal; the guide beacons have been shifted, and two white beacons are now erected on the sandspit extending from the western shore of the harbour.

These beacons, brought in line, and bearing S.S.W., will land over the bar in 18 feet low water springs, and when a red and white beacon at the Pilot station opens of Howlett point, a course may be steered for Harrington point, passing between it and the sandspit.

The channel across the inner bar (1⅓ miles within Harrington point) shifts occasionally, but on every change the buoys are altered so as to denote the two fathom edge, the depth in the middle of the channel being 15 feet.

In running up the harbour, red buoys should be left on the starboard hand, black buoys on the port hand.

At the present time vessels drawing 12 feet can reach Dunedin jetty, and improvements of the channel by dredging operations are still in progress.

Caution.—Light south-east winds, generally accompanied with fog, cause much swell on the bar, which is not the case with north-east winds to which the bar is more exposed.

Tides.—There is no interval of slack water in the entrance of the harbour, where the flood runs five and one-third hours, and the ebb seven hours; the ebb stream begins at forty minutes after high water, and the flood stream at one hour and forty minutes after low water.

West Coast of Middle Island, Bligh Sound.

The following account of a dangerous pinnacle rock in Bligh sound, on which H.M.S. *Clio* struck in February, 1871, has been received from Commodore Frederick H. Stirling.

The Clio Rock, with 9 feet, lies in the second reach of Bligh sound, about halfway between Turnround and Evening points; it is the outer rock of a cluster surrounded by very deep water 2⅓ cables from a bluff point on the eastern shore of the sound; between it and the point are two rocks of similar character, with about 6 feet over them.

The Clio rock is steep-to, on its south-west side 24 fathoms was found within 20 yards of the rock, on the north side soundings of from 5 to 9 fathoms were obtained at a distance of 60 yards.

From the rock,—Bare cone bore W.S.W., Turnround point N. by E. ¾ E., and Evening point S. ¾ W.

Mariners are cautioned that Bligh sound being similar in its features to the other sounds and inlets on the western shore of the Middle island, in having deep soundings close to steep and precipitous shores, and that although the existence of detached outlying rocks is considered to be quite exceptional, still vessels navigating these waters must use due precaution, as similar dangers to the Clio rock may exist where the present surveys would imply there was the usual deep water.

Carimata Strait, China Sea.

The following account of a danger near the Melapies islands in Carimata strait, has been received from Captain M. D. Tallack, of the Mercantile Marine.

[*All bearings are Magnetic. Variation* 1° 15′ *Easterly in* 1871.]

Tallack Shoal.—On the 2nd of March, 1871, the British barque *Mary Tatham*, on her passage through the Carimata strait, struck on a shoal not shown on the charts; this shoal is steep-to, as a cast of 22 fathoms was obtained just before the vessel struck, and when aground there was a depth of 15 fathoms under the main chains. On examination of the danger 20 feet was the least water found, with 20 fathoms close to on all sides.

The following bearings were observed from the shoal,—Soeka, the southern of the Melapies group of islands, N.W. $\frac{3}{4}$ N., distant about two miles,—Pyramid island S.W. $\frac{3}{4}$ S., and Zattak point half open of the north side of Meledan or Button island.

The position of this danger is therefore in latitude 1° 21′ S., and longitude 109° 6′ E.

GENERAL.

Royal Naval School, New Cross.—Tuesday, the 20th June, may not have been a commemoration day at the Royal Naval School, but at least it will be a commemorative day to many who took part in the proceedings of that day, and the circumstances of its being the anniversary of Her Majesty's accession to the throne, and also the day settled on as the "breaking up" day, when His Royal Highness the Duke of Edinburgh consented to be present at the distribution of the prizes, rendered the occasion unusually auspicious.

As may be well imagined, the "Nova Crusians" did their best to do honour to their guest, and as far as flags, flowers, and evergreens were concerned, the metamorphosis of the school-hall was complete; the royal standard floated over the cupola, and even the somewhat prosaic pump in the quadrangle was disguised in holiday attire on the occasion.

As it was known that the Duke was to distribute the prizes, the

pressure on the Committee for tickets of admission was very great; but owing to the excellent arrangement the room was filled, though not overcrowded, and the attendance of the band of the Royal Artillery rendered the time between the admission and the arrival of the Prince less irksome than it would have been.

Punctual to time His Royal Highness arrived and was cordially received, and the business of the day commenced by the Secretary, Mr. Eames, reading the reports of the various examiners, from which a general idea of the state of learning and progress in the school can be obtained. Fortunately for the school, the examiners did not make it all *couleur de rose*, but animadverted very freely where they considered necessary, thus exposing the weak points, which no doubt will be carefully attended to in the ensuing year. Prizes were then distributed to the following gentlemen:—

Sixth Form.—For Good Conduct and Proficiency in Learning: W. E. W. Noble. Classics: Woodrow. Mathematics: Grant. History and Geography: Noble, 1.

Fifth Form.—Divinity: Gillies. Classics: Gillies. Mathematics (*Grant Prize): Heaslop, 1. History and Geography: Macrae, 1.

Upper Fourth Form.—Classics: Hewett and Ibbett, *Æq.* Mathematics (*Grant Prize): Whittall. History and Geography: Tucker.

Middle Fourth Form.—Classics: Briggs. Mathematics (*Grant Prize): Woon. Divinity, History, and Geography: Campbell.

Lower Fourth Form.—Classics: Congdon. Mathematics: Litle (1) and Arnot (1), *Æq.* Divinity, History, and Geography: J. Veitch.

Third Form.—Classics: Telfer. Mathematics: Bills.

Upper Second Form.—General Proficiency: Collins (1); Cook and Miller, *Æq.*

Lower Second Form.—General Proficiency: Eyton and Rowe.

First Form.—General Proficiency: Wildey and Bridges.

French Classes.—Class I. Woodrow (1) and Gillies. II. Houghton. III. Ridge. IV. Woon and Wylde (1), *Æq.* V. Slater (2).

German Classes.—Class I. Gillies. II. Renwick. III. Fyfe and Houghton, *Æq.*

W. E. W. Noble—Malcolm University Scholarship.

Gillies, I. Taylor, and Travers—Cookney Medals, for Industry and Good Conduct.

Freeland, Webb, and Meheux—Writing Prizes.

F. C. D. Sturdee—First Naval Cadetship and †Yarborough Scholarship.

G. A. F. Truscott—Second Naval Cadetship.

A Naval Cadetship, placed by Capt. Grant, R.N., at the disposal of Admiral Sir James Hope, G.C.B., Commander-in-Chief, at Portsmouth, and given by him for competition amongst the pupils, was gained by P. J. Elliott.

Tuck, G. K.—Nomination for an Assistant Clerkship, R.N.

Navigating Cadetship not yet awarded.

* Founded by the late Admiral Sir R. Grant.
† Founded by the late Earl of Yarborough—Interest of £1,000.

Drawing Prizes.—First Class: Grant and Macrae (1). Second Class: Heaslop (1) and Gillies. Third Class: Congdon, Houghton, Loch, Ridge, W. H. Rowland, Tuck (2), and Speed.

Lambart, Tuck, and Renwick—Drill Prizes.

Honourable Mention.—Divinity: E. Messum and W. Rowland. Classics: Brooker, Macrae (2), Houghton, Hamilton, Slater (1), Parke, Jones, Murdoch, Oliver, Eyton, Litle (3), S. Messum, Rowe, Slater (3), Whiting, Johnstone (2), Martyr, and Wildey. Mathematics: Brooker, Gillies, Hewett, Tuck (2), Briggs, Courtenay, Drury, Morris, Ridge, Slater (1), Barton (2), Greetham, Lewis, Burton, Litle (2), Robins (1), Telfer, Webb, Collins (1), Cooke, Hannan, Ball, Campion, S. Messum, Rowe, Slater (3), Whiting, Godfrey, Hudson, Staniforth (2), Price, and Veitch (2). French: W. Rowland, Ibbett, Smith, Slater (1), Woods, Collins (1), Fittock, and S. Messum. German: Messum, Macrae (1), Lambart, Ibbett, Whittall, Ridge, Hewett, and Campbell. Writing: Shears, Skead, Litle (2), Hill, Chapple, and Bradley. History and Geography: Gillies (equal with Prizeman), W. Rowland, E. Messum, and Hewett. General Proficiency: Jordan, Fittock, Delabere, Martyr, and Godfrey. Drawing: Woodrow (1), Cooper, Shears, Ball, Paget, Rowe, L. Slater, and Sturdee.

At the conclusion of the distribution, His Royal Highness made a few pertinent observations relative to the objects of the school and his own connection with the Navy, and the interest he consequently took in adding a cheery word to the boys, and hoped in the future to be shipmates with some of them. The president, Admiral The Hon. A. Duncombe, then proposed a vote of thanks to His Royal Highness, which was seconded by the principal, the Rev. E. B. Slater, and in returning thanks His Royal Highness asked for an additional week's holiday for the boys, and then after inspecting the general arrangements of the school, took his departure amid the hearty cheers of the boys.

Royalty has of late been a great deal amongst the maritime service or rather the juvenile members of the profession. The Duke of Edinburgh at the Royal Naval School and on board the *Worcester* training ship, and Prince Arthur on board the *Warspite* and reviewing naval boys at Kensington, have done their best to animate and reward the maritime youth of our country. We notice with much satisfaction that the Trinity House have instituted two annual prizes to encourage the boys on the *Worcester*, one to be given to the boy who gains the Queen's prize and the other for seamanship. The Queen's prize and the Trinity House metal sextant were this year awarded to John West Matthews, and the metal sextant for seamanship (also given by the Trinity House) to Walter Vivian Hurst. On the *Warspite* the proceedings in the presence of H.R.H. Prince Arthur seem to have been particularly interesting, and the enthusiasm very great. His Royal Highness

some few days after reviewed a number of naval and other school boys at the Royal Horticultural Gardens, in which the following schools took part:—Central London District School, North Surrey District School, the South Metropolitan District School, Forest-gate District School, *Goliath* ship, Marylebone Industrial School, Stepney Industrial School, Lambeth Industrial School, Holborn Industrial School, Mile-end Industrial School, Islington Industrial School, Shoreditch Industrial School, West Ham Industrial Schools, Strand Union Industrial School, Royal Hospital School Greenwich, Bethnal Green Industrial School, St. Mary's Orphanage, Marine Society's training ship *Warspite*, Homeless Boys of London, viz.—*Chichester* training ship and Refuge Farm School. The boys defiled with wonderful steadiness, and presented a contrast of dress in their uniform of blue or drab, or grey. Those from the *Warspite* and Greenwich were greeted with cheers.

The correspondent of the *Standard* says that the award of the flags of honour gave general satisfaction, and, in fact, was but the reflex of the opinion of all who knew anything about manœuvres amongst those who witnessed the evolutions. We have seen many military spectacles by the full-grown soldiers of different nations in our time, and we are bold to affirm few of them could surpass the youths of the Royal Hospital School in steadiness and precision of movement. This battalion was the cream of the show, and looked exceedingly pretty as it moved by the Prince in quick time in open column of companies, each company mustering five and twenty files. The boys wore white frocks and straw sailor hats. They were headed by a diminutive drum-major in bearskin and gold-frogged tunic with a gorgeous dandoleer across his breast, and silver-knobbed staff in his hand. Another feature, a dark one this, of the Greenwich show, was a little nigger with a serpentine brass instrument bigger than himself coiling round his body. Each school was preceded by a monitor bearing a bandrol with its name in front of the leading company. The sailor laddies from the *Goliath* in white, from the *Chichester* in blue, and the *Warspiters* with their famous dog Neptune, and an ambulance hammock and a pole strung with porringers, looked comically workmanlike. Very enjoyable the whole display would have been but for that nasty ill-natured shower. The quick succeeding ranks, the parti-coloured standards, the different head-dresses, amongst which Glengarry caps were prominent, the various corps of musicians in their varied uniforms, braided, frogged, or laced, the big drums, manned fore and aft that they might be carried better, all combined, made up a living panorama.

ROYAL NATIONAL LIFE-BOAT INSTITUTION.—A meeting of this Institution was held at its house, John Street, Adelphi, on Thursday, 1st June; Thomas Chapman, F.R.S., V.P., in the chair. Rewards amounting to £56 14s. were voted to the crews of some life-boats of the Institution for going out on service during the past month. One of these services was very creditable, that performed by the Charlie Peek life-boat, stationed on the Isle of Whithorn, N.B. It appeared that during a gale of wind the smack *Vale of Conway* was seen in a disabled state at some distance from the land. The vessel had been seriously damaged by her mainboom breaking adrift, and she sank in deep water. Her own small boat was likewise stove, and all hope of saving their lives had been given up by her crew of three men, when the life-boat appeared on the scene, having come through a very heavy sea, and conveyed them safely to the shore. The thanks of the Institution inscribed on vellum, and £1 each, were voted to Mr. George Dinsdale, of Blyth, master of the screw steamer *Bolivar*, and to Mr. Joseph Stevens mate of the steamer *Weardale*, of Sunderland, in acknowledgment of the courageous services in wading into, and swimming a considerable distance through a heavy surf with a line to the assistance of a man whose vessel, the smack *Nimrod*, of Sunderland, had during a strong wind stranded off Blyth and drifted so far on to a reef of rocks that it was impracticable for any boat to get near him. Other rewards were likewise granted to the crews of shore boats and others for saving life from wrecks on our coasts. Payments amounting to £750 were ordered to be made on various life-boat establishments. Sundry liberal contributions were announced as having been received. The late J. J. Tancred, Esq., of Dublin, had left the Institution a legacy of £1,000, on condition that a life-boat named the Sarah Tancred be placed at some station near Dublin. The late Mr. W. H. Dean, of Stratford, had also bequeathed the Institution £100; and the late Mrs. Eliza Watson, of Loughton, £100 duty free. It was decided to place a new life-boat at Bridlington, to be named after the late Mr. John Abbott, of Halifax, who had left a munificent legacy to the Institution. The Society's "Instructions for the Restoration of the Apparently Drowned" continued to be extensively circulated, and the Commissioners of Police had ordered 10,000 copies to be distributed amongst the Metropolitan Police.

LIGHT FOR LIGHTHOUSES.—As scientific knowledge advances mankind constantly becomes sensible of its progress, by reason of the numerous practical advantages which follow in its train. the

illumination of lighthouses owes a very great deal to science, the elaborate apparatus of the present day is a marvellous contrast to the blazing coal fire beacons of very ancient days, or even the lamps and reflectors of more modern times. And still we are progressing. It is now in contemplation to utilize gas for burning in lighthouses, and a gigantic experiment is about to be made with this combustible at the Haisborough lighthouses on the coast of Norfolk. For some time past oil gas has been successfully used at the Howth Bailey lighthouse, County Dublin, and is said to give a very brilliant light, but efforts are now being made to utilise ordinary coal gas in England. The necessary buildings and appliances will no doubt affect the adoption of gas injuriously on the ground of its expense, but if it prove successful the ultimate advantage will compensate for the first great outlay, by a diminished cost for maintenance and a more powerful light. In addition to the trial of gas, sundry experiments have been and are being made in England and Scotland, as to the advantages to be gained by using paraffin and petroleum oils instead of colza. The mineral oils are cheaper, and it is said can be made to give as good light as colza, but the burner used for colza is not adapted for obtaining the greatest power of the mineral oils, and consequently it would be necessary to go to some expense in altering the colza burners. The experiments however, are as yet in an incomplete state, but when the results are definitively known we hope to be able to furnish our readers with the particulars.

THE WELSH COLONY IN PATAGONIA.—Commander R. P. Dennistoun, of H.M.S. *Cracker*, has sent to the Admiralty, a despatch which gives a highly interesting and, on the whole, a reassuring account of the Welsh Colony in the Chupat River, Patagonia. The colonists have had, since their settlement in their new homes, some severe trials. Their chief difficulties have been want of communication with the outside world and repeated and lengthened droughts. Commander Dennistoun and his crew were the first strangers the colonists had seen for twenty months; and, to reach Buenos Ayres, an unknown tract of country, two hundred miles long, has to be traversed. The result of this was that the whole colony had been for ten months without any description of groceries, and during this period they had to live chiefly on bread, butter, and milk, and what guanaco and ostrich meat they could obtain by hunting. Proper agricultural implements are also a great want of the colonists. In this matter of communication they have been peculiarly unfortunate. for twice vessels used for this purpose were wrecked. But little

success has attended the agricultural operations of the colonists; their wheat crops have generally been very poor. At one period this long series of mishaps had thoroughly discouraged them—so much so that they killed some of their cattle, destroyed their houses, and set out in quest of a more promising home. After some time, however, they again returned to their original settlement in the Chupat river. There they now are; and, notwithstanding all they have had to go through, they are, the dispatch informs us, "in excellent health and spirits," and "not one individual expressed a wish to leave the colony." If the difficulty of communication were once overcome, the prospects of the colony would be, on the whole, favourable.

According to the *Levant Herald*, an offer has just been made to the Porte of an American ironclad, which, if accepted, will place Turkey in possession of by far the most powerful war ship in the world. She has been for more than four years in course of construction at New York, and the latest improvements have, it is said, been applied by her builders. She combines, therefore, all the best features developed in naval architecture. She is built on the monitor system, with low freeboard and one turret pierced for a couple of the heaviest modern guns. Her proportions are—length, 401 feet; extreme outside breadth, 54 feet; ditto inside, 45 feet; displacement, 13,523,865 lb. With the exception of the upper deck beams and the armour backing, the entire hull is of iron. It is double throughout, and, except at the extreme ends where such great strength is not necessary, the inner skin is treble riveted. The iron used is the famous Pennsylvania charcoal iron, and the whole of the huge plates have been separately tested. Those of the skin are one inch thick, with a tensile strength of 62,720 lb. to the square inch. There are seven main shot-proof bulkheads, with several smaller ones at the bow and stern. The whole of these, as also the coal-bunkers, are watertight, and as the coal is consumed water can thus be pumped in to keep the vessel in fighting trim. The side armour consists of two rolled plates each 5 in. thick, making 10 in. of iron, backed by 44 in. of white oak, the butts being scarped and great additional strength being thus given to the hull. The whole of the armour backing has been thoroughly soaked in creosote and coated with tar to preserve it from rot and worms. The main deck is planked with 8 in. timber and covered over with inch-thick rolled iron plates, being thus made entirely shot-proof. The turret is composed—first, of four rolled plates inch-thick, then of a layer of wood, and outside this the armour

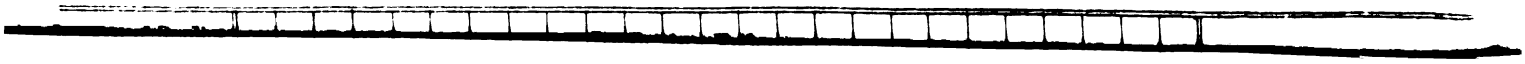
proper, consisting of rolled plates 15 in. thick, making in all 19 in. of iron, besides the heavy wooden backing. Its armament at present consists of two 20 in. bore Rodman naval guns, with an all-round fire, throwing a shot of 1,080 lb., with a powder charge of 200 lb. The engines, which are said to be the most perfect yet constructed in the United States, are composed of four cylinders, driving a pair of twin four-bladed screws of 18 ft. diameter and 27 ft. pitch. They are fed by ten horizontal boilers, with three furnaces each, with a total heating surface of 28,000 square feet. The coal bunkers can carry fuel, for a voyage of 3,500 miles, with full armament and stores for a six months' cruise. It is calculated that a speed of at least 16 knots an hour will be obtained, as the greatest immersed transverse section is only 890 square feet, and the water lines are exceeding fine. The bow is of enormous strength, with a view to being used as a ram. Altogether the full details of her construction and equipment represent this huge vessel as being one of the most powerful ships of war in the world. Her builders have sent out a special agent, M. de St. Laurent, to offer her first to the Porte, and if not bought then to the Russian Government.

THE withdrawal of the Merchant Shipping Code has for some time been looked for as a matter of course by all who are interested in maritime matters. The House of Commons seems to have fought shy of the 696 clauses:—counts out and windy debates seem to have been the order of the day on the part of our senators, and Merchant Shipping Legislation is deferred *sine die*, or at any rate for another session.

THE Aurora islands have not disappeared, as has been asserted, —for the simple reason that they never had any existence. It is suggested in *Nature* that the insertion of the name in the French chart of the South Atlantic was due to the imagination of the first reporter, who invested an iceberg with substantial attributes. There is an island called Aurora forming one of the Low Archipelago group, and lying some 2,500 miles eastward of the New Hebrides. It is fertile and inhabited, but its elevation is such as to render it extremely improbable that it should have suddenly disappeared. When the news of the loss of the Iles de l'Aurore reached England, it was hastily concluded that the single island had been submerged.

ERRATA.—We have to apologise for an unintentional error in our last number; in the memoir of the President of the Royal Society we styled him Major-General Sir Edward Sabine, etc., it should have been *General* Sir Edward Sabine.

We have also to call attention to a misprint in Admiral Bethune's letter, page 415, line 29, for 60° and 20°, read 60′ and 20′.



THE

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NEW SERIES.

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DEEP-SEA THERMOMETERS.

By Captain J. E. Davis, R.N., F.R.G.S.

Read before the Meteorological Society, April 19th, 1871, and reprinted by permission of the Council.

The objects of this paper and of the experiments and observations recorded therein, are:—

1. The ascertainment of the effect of pressure on thermometers used for deep-sea purposes.

2. To obtain a scale whereby observations made by the thermometers now in use could be corrected for pressure.

3. To obtain a scale whereby observations made previously by other thermometers can be utilized.

In the early part of the year 1868 the attention of the Hydrographer of the Navy was directed to the unsatisfactory nature of the deep-sea Six's thermometers then in use, and it was pointed out to him that, so far as those who had had experience could judge, we had retrograded in the construction rather than advanced; but as one of early make (such as were used by Sir James Ross in 1840) could not be procured, no actual comparison could be made.

The self-registering thermometer known as "Six's," invented by Mr. James Six, of Canterbury, was described by him in the "Philosophical Transactions" of the Royal Society in 1782; but as the description, as recorded in those "Transactions," is by no means clear in regard to the principle on which the thermometer is con-

structed, but dwells rather on its mode of self-registering (which was the *point* of the invention), it may not be out of place here, when recording observations and experiments made with this truly valuable instrument, to append a brief description of it.

As originally made, it consisted of a long cylindrical bulb united to a smaller tube of more than twice its length, bent up and down in the form of a siphon with the cylinder in the centre, and terminating in a small oval bulb at the top,—the lower portion of the siphon being filled with mercury, the long bulb, the other parts of the tube, and about a third of the small bulb with rectified alcohol, the remaining part of the small bulb being filled with highly compressed air, which acts as a spring to compress the mercury and cause it to rise in the opposite tube, on the contraction (from cold) of the spirit.

A steel bar inclosed in glass, with flattened projecting glass ends, is inclosed in each limb of the siphon above the mercury, the flattened ends preventing the mercury from passing them; these, from their weight, would rest on the mercury, but each has a fine hair tied to its upper extremity and bent against the interior of the tube, to act as a spring with sufficient elasticity to keep the bar or index supported in the spirit, while the application of a horse-shoe magnet close to the glass will draw them down to the surface of the mercury in each stem.

Without altering the principle, a modification in the form has since been made; thus, instead of the long cylindrical bulb in the centre, a bulb filled with spirit is joined to the upper end of the siphon, abreast of, but rather lower than, the opposite bulb. By this arrangement the instrument is made more compact, and its strength increased by lessening the number of bends, thus better adapting it to the comparative rough usage it has to be subjected to when used for deep-sea purposes.

On a rise of temperature, the spirit in the bulb will expand and depress the mercury in one stem, while it raises it in the other, carrying with it the index, whilst a return of cold will contract the spirit in the bulb, allowing the elastic force of the compressed air to depress the mercury in the opposite stem and raise it in the other, each index retaining its position at the extreme of heat and cold attained, while the top of the mercury in each limb denotes the temperature of the time being. It will be observed that the cold is indicated at the upper end of the one stem, and heat at the upper end of the other, and the scales or graduations thus become reversed.

The objections made to these thermometers were :—

1. Their fragility, the slightest jar or blow often breaking them.

2. The necessity of their being always kept in a vertical position.

3. The uncertainty of the register, the indices being generally capable of being shaken down.

4. Their large size, in connection with friction in passing through the water.

5. The substance they were mounted on, being generally wood, became so swollen by pressure of the water as often to render them incapable of being withdrawn from the case.

It was also considered that in all thermometric observations at great depths we had been "working in the dark," in that we had no idea of the effect pressure had on the instrument, and consequently on the recorded results; and it was reasonable to suppose that as the action of a thermometer was affected *in vacuo*, an opposite effect would be had by placing them under pressure, the more especially as in the one case the pressure of only one atmosphere, or 15 lbs. to the square inch, was removed, while in the other the atmospheres would have to be reckoned by hundreds and the pressure by tons. On this point we were not without actual observation; for Mr. Glaisher, during the year 1844, in some experiments made on the temperature of the Thames near Greenwich with delicately constructed instruments, found that the indications of temperature were affected by pressure on the bulb of the thermometers, and that at a depth of only 25 ft., or about three-fourths of an atmosphere, the readings were increased by 2°; but no definite conclusion could be arrived at from these observations in respect to our deep-sea thermometers, beyond the fact that they were liable to be so affected.

It was therefore suggested to the Hydrographer—

1. That the author might be placed in personal communication with different makers in respect to the best construction for the purpose required; and

2. That a series of experiments should be made by placing some thermometers in an hydraulic press, in conjunction with one in an hermetically sealed iron bottle (as a standard), and subjecting them to pressure, that they should be kept under pressure sufficient time to allow the thermometer within the bottle to take up the temperature without, and then the whole compared with the standard.

The first suggestion was immediately acceded to; and those makers from whom the Meteorological Department obtained instruments (viz., Messrs. Elliot, 449, Strand; Mr. Casella, Hatton Garden; and Messrs. Negretti and Zambra, Hatton Garden) were applied to, and the following desiderata submitted to each.

Desiderata for Deep-sea Mercurial Thermometers.

1. That they could not be injured by being placed in a horizontal position, or even in a reversed position and shaken.*

2. That the bulbs should be entirely protected.†

3. That the ends of the indicators should be made so exact to the diameter of the tube that there could be no possibility of globules of mercury getting above the end.

4. That the indicators should be made so stiff with the frictional hairs that no vibration, shaking, or tapping could possibly move them.

5. That the plate on which the scale is marked should be made only sufficiently wide for the scale, and also that it should be made so that the tubes could be sunk in it to one-half their diameter, thus bringing the indicator on a level with the scale and avoiding error by parallax in reading off.

6. That between the brasses (which fix the tube to the plate) and the tube a piece of wash-leather should be inserted, to prevent breakage by a jar.‡

7. The range of temperature necessary for ocean observations, and all that need be made visible on the scale, is from + 20° to 100°.

8. Small size.

9. Lowness of price.§

10. The use of wood in mounting to be discontinued. The Hydrographer suggested ebonite for mounting thermometers on; this was adopted and found to answer.

Subsequently Mr. Pastorelli, 208, Piccadilly, expressed a wish to make some for trial; this was complied with; but as Messrs. Negretti and Zambra did not respond to the request, the number of makers was still confined to three, and six thermometers were ordered from each. These instruments were sent in (hereafter called the Hydrographic Office pattern), and Mr. Balfour Stewart, of the Observatory at Kew, was consulted as to the *modus operandi* of testing by pressure, and he approved of that already suggested.

A difficulty arose in respect to a hydraulic press: the use of some

* Much stress was laid on this point, as it is almost impossible to keep them always in a vertical position on shipboard.

† This protection was intended merely to enable the instrument to be handled with more safety than it could be without.

‡ As many thermometers had been broken at these points, it was concluded that this trifling omission had been the cause.

§ This was explained as not being intended to beat the maker down, or to get an inferior instrument, but to enable more to be used for observing with.

in London could not be obtained, and others were not adapted to the purpose, so that the testing was deferred, and some of the instruments were sent to H.M.S. *Gannet*, then deep-sea sounding on the edge of the Gulf Stream, and afterwards some to H.M.S. *Lightning*, for her dredging cruise.

On the return of these vessels, the conflicting nature of the temperatures obtained from those supposed to exist (as derived from observations in other localities), rendered the necessity of ascertaining the nature and amount of error due to pressure the more imperative.

At this juncture Mr. Casella (being much interested, although believing that pressure would neither affect the thermometers nor their results) undertook to have a testing apparatus constructed at his own expense, capable of producing a pressure of three tons to the square inch. This hydraulic testing apparatus was made by Messrs. Kittoe and Brotherhood, engineers and millwrights, Clerkenwell.

At a meeting of the Committee of the Royal Society, held in the Hydrographer's room, in April, 1869, and at which all the appliances relating to deep-sea sounding were placed before them, the plan of operation for testing the thermometers was discussed, and that by means of an iron bottle approved. Dr. Miller, V.P.R.S., proposed encasing the full bulb in an outer covering of glass containing air, in order to permit the lighter fluid (air) to be compressed without affecting the bulb within: and one such was directed to be made; but instead of the outer casing being filled with air, it was nearly filled with alcohol, which being heated to reduce the quantity of air, the bulb was then hermetically sealed. Mr. Casella was also directed to make others that would facilitate the observations.

At the time these experiments were proposed, it was not known that a thermometer had been constructed at the suggestion of Mr. Glaisher, by the late Admiral FitzRoy's directions, with the view of removing the difficulty of pressure; this was done by encasing the long bulb at the back of the instrument in glass, and nearly filling the space between the case and the bulb with mercury;* and one on this principle was then in the instrument-room of the Meteorological Office; but although some had been used for deep-sea purposes, the further issue of them had been stopped on account of their fragility, and thus the means for obtaining accurate observations were virtually the same as before.

During the delay caused by the want of an hydraulic press, a Committee of the Royal Society was appointed to direct the inves-

* See Meteorological Papers, No. 1, 1863.

tigation of the ocean observations since so successfully carried out in H.M. ships *Lightning* and *Porcupine*, and the proposal by Dr. Miller to encase the full bulb, recorded above, was made without the knowledge of such a one having been previously made; but as it differed in form, it has been called the "Miller pattern" to distinguish it.

It was decided to test them at pressures equal to the following depths in the ocean, viz., 250, 500, 750, 1000, 1250, 1500, 1750, 2000, 2250, and 2500 fathoms, the rule to be applied being 33 feet = one atmosphere = 15 lbs. on the square inch. From this the following Table was constructed for use:—

Pressure.			
Fathoms.	Atmospheres.	lbs.	tons.
250	45·5	682	0·30
500	90·9	1363	0·61
750	136·4	2045	0·91
1000	181·8	2726	1·21
1250	227·3	3408	1·51
1500	272·7	4089	1·82
1750	318·2	4771	2·12
2000	363·6	5452	2·43
2250	409·1	6134	2·74
2500	454·5	6817	3·05

On the 3rd of May the hydraulic testing-apparatus, or press, was placed in the back yard of Mr. Casella's house, against a wall which screened it from the sun, and it was tested to two tons pressure.

The next day the following thermometers were taken to Hatton Garden, viz.:—

Nos. 56 and 57 Casella.. Hydrographic Office pattern.
66 and 67 Elliott .. ,, ,, ,,
72 and 73 Pastorelli ,, ,, ,,
No. 1..... Casella.. Specially made with an extra-thick cylinder bulb to *defy* compression.
3..... ,, .. Spherical bulb; extra-thick glass. This thermometer was made, at the special request of one of Mr. Casella's workmen in order to resist effect by pressure.
4..... ,, .. Short cylinder bulb; extra-thick glass.
6..... ,, .. A glass cup fitting over bulb, designed by Mr. Siemens.

All the above were Six's thermometers with the bulbs unprotected.

No. 2..... Casella.. Glass-encased bulb, as proposed by Dr. Miller, but with the case nearly filled with spirit.

5..... ,, .. Long cylinder bulb at the back, encased in glass, and nearly filled with spirit.

These instruments were first compared in air and then immersed in a tub of water, No. 57 being placed in an iron bottle. Set the indices and placed the thermometers in the cylinder of the press, and pumped on a pressure equal to 250 fathoms, and kept it on two hours, when Dr. Miller and Dr. Carpenter arrived and the pressure was removed.

It is useless to record the result of this first experiment; or it may rather be stated that the result were *nil*, except ascertaining the weak points of the process adopted; these were:—

1. The iron bottle was useless, the water having forced its way through the worms of the screw and the leather washer at the top, into the cylinder.

2. We had used too many thermometers, as difficulty was found in reading off and re-setting the indices quick enough to prevent alteration taking place before re-immersion in the cylinder.

It was therefore necessary, either that the iron bottle should be made to withstand the pressure, or some standard found to compare with, independent of it. The bottle was afterwards made tight, and burst under a pressure of about 5000 lbs. to the square inch; but as the Miller-pattern thermometer subsequently proved so near perfection, it was decided to use that as a stand for the Hydrographic Office pattern.*

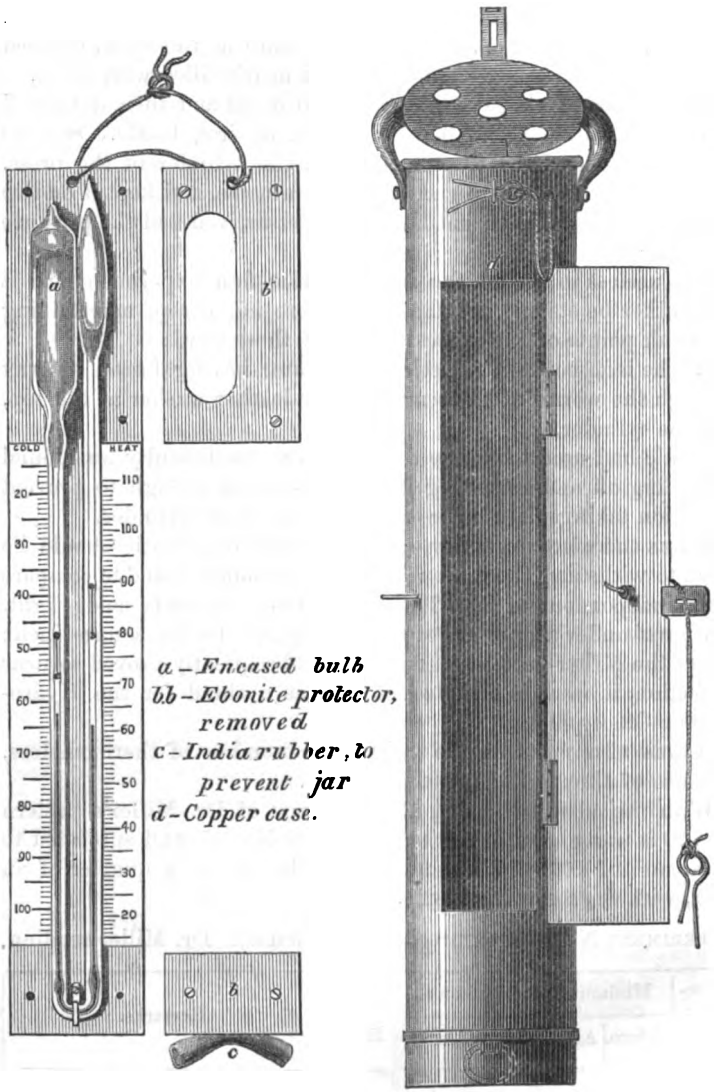
It was also necessary to reduce the number of thermometers, and also of the readings, to a minimum.

With the view of testing the efficiency of Dr. Miller's pattern (No. 2) it was placed in the cylinder with No. 57, and subjected to a pressure of 4032 lbs. (about 1480 fathoms) for a quarter of an hour, with the following result.

EXPERIMENT No. 1 (pressure = 1480 fathoms). Dr. Miller reading.

Thermometer.	Minimum.		Maximum.		Diff. of Max.	Remarks.
	Before.	After.	Before.	After.		
2	47°·5	47°·5	47°·5	48°·0	0°·5	Thermometer in tube 47°·5.
57	47·5	47·5	47·5	55·0	7·5	

* I was not aware at that time of the existence of the enclosed Phillip's thermometer as designed by Sir William Thomson.—J. E. D.



This experiment at once proved the efficacy of the encased bulb; and the experiment was repeated with more thermometers, with the same pressure and for the same period of time.

EXPERIMENT No. 2 (pressure = 1480 fathoms). Dr. Miller reading.

Thermometer.	Minimum.		Maximum.		Diff. of Max.	Remarks.
	Before	After.	Before	After.		
	°	°	°	°	°	
Encased 2	47·5	47·5	47·5	48·5	1·0	
„ 5	48·0	47·5	47·4	48·3	0·9	
1	47·5	47·5	47·5	53·5	6·0	
3	48·5	48·0	47·5	56·0	8·5	
6	48·0	47·5	47·5	58·0	10·5	
57	48·0	47·5	47·5	55·0	7·5	
Phillip's Alpine.	...	...	47·7	118·0	70·3	

It will be seen by this experiment that while the mean difference of the encased bulbs was only 0·95°, that of the two made to defy compression was 7·25°, that with the cover 10·5°, and the Hydrographic Office pattern the same as in No. 1, 7·5°.

The "Phillip's" was an ordinary make, with a very small bulb; and the great difference shown by it proved that the amount of compression is in proportion to the thickness of the glass; but in immediate connection with the subject the experiment clearly demonstrated two facts, viz.:—

1. That very nearly all the difference, or error, is due to pressure on the full bulb; and

2. That by encasing the bulb we have nearly a perfect instrument. This result was the more important in rendering future experiments, in a manner, independent of the iron bottle, which again failed with a new washer.

Notwithstanding the satisfactory result obtained in enabling us to decide on a thermometer for future use, it was necessary if possible, to establish a scale whereby temperatures already taken with instruments of the Hydrographic Office pattern might be corrected for pressure, and also to ascertain if all, or what part, of the difference shown under pressure in the Miller pattern was due to calorific effect produced by sudden compression of the water in the cylinder or by compression of the unprotected parts: preparation was accordingly made to continue the experiments.

It being necessary, as before stated, to reduce the number of the thermometers, and also the readings, to a minimum, the following were selected, viz.:—

Nos. 2 and 5 Casella.. Encased bulbs.
56 and 57 „ .. Hydrographic Office pattern.

No. 73..... Pastorelli .. Hydrographic Office pattern.
67..... Elliott .. ,, ,, ,,
9641..... Casella .. Alpine.

These were attached to a float (to avoid immersing the hand in the water) and placed in the cylinder filled with water, to remain all night; the cistern, from which the water is pumped into the cylinder was filled, and also a tub of water for replenishing placed by the side in order that the water in each might be, as nearly as possible, of the same temperature in the morning.

As the relative readings of the maximum and minimum of each thermometer were compared in both air and water and found to agree, and as a progressive increase in the temperature of the cylinder was observed, the difference between the minimum and maximum indices is used: the maximum mercury is always recorded; but as it had not always time to adjust itself to its normal state, it can only be used as a check to the minimum readings.

The thermometers were read in the order in which they are placed; when all were read, the indices were set as quickly as possible, and the instruments at once lowered into the cylinder and the pressure applied.

May 5th the first series of experiments were made, Mr. Casella reading.

First Series of Experiments.—Errors at different pressures.
Abridged from Original.

Thermometer.	No. 1. 250 fm. 682 lbs.	No. 2. 500 fm. 1363 lbs	No. 3. 750 fm. 2045 lbs	No. 4. 1000 f. 2726 lbs	No. 5. 1250 f. 3408 lbs	No. 6. 1500 f. 4089 lbs	No. 7. 1750 f. 4771 lbs	No. 8. 2000 f. 5452 lbs
	°	°	°	°	°	°	°	°
2	1·5	2·1 ?	1·0	1·2	1·2	1·6	1·4	1·6
5	1·3	1·6	0·2	0·6	0·4	0·8	0·8	1·6
56	1·1	2·7	3·8	4·3	5·5	7·0	8·0	9·5
57	1·0	2·7	3·8	4·9	5·6	7·4	8·2	9·7
73	1·9	2·6	4·2	6·0	6·8	8·2	9·7	10·2
67	3·9	7·9	Broken*	...	...	...	...	...
66	...	...	...	...	13·3	16·4	18·7	Broken†
Phillip's Alpine		...	...	...	...	...	...	71·0
Thomson‡		...	...	...	...	...	...	1·1

* The instrument was taken out safely; but while reading off, the full bulb cracked right across.

† Broke at a pressure equal to 1848 fathoms.

‡ This insulated thermometer is a Phillip's encased in a glass cylinder containing a little spirit, designed by Sir William Thomson.

The thermometers were under pressure for an average time of thirty-seven minutes in each experiment.

As the pressure was being pumped on in the last experiment, heard a sharp crack when the guage indicated a pressure of 2¼ tons: the sound was so loud that it was heard in the house. On taking the instruments out, No. 66 was found to be completely smashed, and must have broken in several places at the same moment.

May 6th.—The following experiment was made with the Hydrographic Office pattern (not used yesterday) for comparison. Mr. Casella reading.

Pressure = 2000 fathoms = 5452 lbs. Under pressure seventeen minutes.

Thermometer.	Error.	Thermometer.	Error.
	°		°
2	1·4	71	11·3
5	1·2	74	10·3
53	9·9	75	9·6
58	10·7	Thomson	1·0

The results of the first series of experiments are presented graphically in the annexed diagram, No. 1.

Second Series of Experiments.

June 21st.—The thermometers were placed in the cylinder, which was filled with water; the supply-tub or cistern for pumping in from, and a tub of water standing near the press, were also filled and thus left all night.

June 22nd.—A dull morning, with no sun, all the conditions most favourable for observing.

Before commencing, obtained two tubs of water with 12° difference of temperature (determined with a delicate thermometer), and, to ascertain the time required by one of the Miller pattern to take up temperature, removed one suddenly from one tub to the other (from the cold to the warmer) and then back.

To take up 12° of heat it took seven minutes; the first 6° (as might be expected) were taken up more rapidly than the second.

To lose the same amount of heat, by being placed in the colder water, it took only four and a half minutes.

It was therefore concluded that by allowing the thermometers to

remain under pressure eight minutes, the same results would be obtained as if allowed to remain half an hour or more, as in the first series of experiments.

The thermometers used were :—

Standard....	Casella.....	Dr. Miller's pattern.
No. 54.....	,, ...	Hydrographic Office pattern.
56.....	,, ...	,, ,, ,,
76.....	Pastorelli....	,, ,, ,,
73.....	,, ...	,, ,, ,,
Thomson ..	Casella.....	Encased (Sir William Thomson's design).

Second Series of Experiments—Errors at different pressures.

Abridged from original.

Thermometer.	No. 1. 250 fms.	No. 2. 500 fms.	No. 3. 750 fms.	No. 4. 1000 fms.	No. 5. 1250 fms.	No. 6. 1500 fms.	No. 7. 1750 fms.	No. 8. 2000 fms.	No. 9. 2250 fms.	No. 10. 2500 fms.
	°	°	°	°	°	°	°	°	°	°
Standard	0·7	0·7	1·2	1·5	1·6	1·5	1·7	2·0	2·0	2·2
54	1·4	3·1	3·9	5·2	6·4	7·8	8·3	9·7	11·1	12·9
56	1·8	2·8	4·0	5·3	6·3	7·8	8·8	9·9	10·9	12·0
76	1·2	2·5	4·2	4·9	6·3	7·2	8·4	9·6	10·9	11·7
73	1·4	3·0	4·6	4·9	7·4	7·8	10·2	11·5	12·3	13·7
Thomson	0·0	0·1	0·0	0·3	0·1	0·5	0·3	0·6	0·8	0·4

The thermometers were under pressure eight minutes in each experiment.

NOTE.—While conducting these experiments we caught a small water-worm in the water-tub, placed it in a tube and tied a piece of rag over it, and placed it in the cylinder, subjecting it to a pressure of 3408 lbs. for 8 minutes; it came out alive. Repeated the experiment with a pressure of 4089 lbs. for the same time; after a little time it showed signs of life. Again repeating the experiment with a greater pressure, the bottle was broken and the worm lost by the accident.

The results of the second series of experiments are laid down in the diagram annexed No. 2.

The mean difference for each 250 fathoms by each thermometer is as follows :—

Abridged.

By First Series of Observations.		By Second Series of Observations.	
Thermometer.	Difference.	Thermometer.	Difference.
	°		°
2	+ 0·20	Standard	+ 0·22
5	+ 0·20	54	+ 1·29
56	+ 1·19	56	+ 1·20
57	+ 1·20	76	+ 1·17
73	+ 1·27	73	+ 1·37
		Thomson	+ 0·05

(To be continued.)

EDUCATION IN THE NAVY.*

It cannot be said of the present First Lord of the Admiralty that in taking upon himself the duties of his office, he has seized the reins and is determined to be his own charioteer; and we augur much good from the fact of Mr. Goschen having now, on two occasions, listened with care and attention to important matters connected with the constitution of the Navy, and returned answers which, without committing himself to any line of policy, are eminently satisfactory to all who wish well to the Service which he represents.

Doubtless, Mr. Goschen has, and must have his advisers who may have coached him to what *must be*, but he wisely defers any definitive conclusions from that advice, until he himself can go into the matter more perfectly than he possibly could have done from the short time he has been at the head of the Admiralty; this was apparent in his reply to Mr. Brassey's motion in the House of Commons on the Education of the Officers of the Navy, and it is generally acknowledged that Mr. Brassey did good service in bringing the matter so prominently before the House. Although we may disapprove of his propositions, we cannot overrate the importance of the consideration as to what age a youth should enter the Navy, and what his training should be before he is permitted to take upon himself the active duties of his profession.

Notwithstanding the opinion of the authorities advanced by Mr.

* This article was ready for publication in our July number, but want of space compelled us to postpone its insertion.—Ed.

Brassey in support of his proposition, that sixteen should be the age of entry into the service, with many others we cannot agree to that, although but a couple of years should be the difference of opinion; still those two years at that time of a boy's life are of vital importance in the matter, and we believe that fifty per cent. of the lads who would willingly go to sea at the age of fourteen (and keep to it as a profession) would not "put in an appearance" at the age of sixteen, or would soon leave in disgust after they had entered. The lad who is willingly obedient to his parents, or anyone placed in authority over him at the former age, begins to have an opinion of his own at the latter—due doubtless to the fastness of the age—but he begins to question and argue with the "Governor," and could far less brook the authority and restraint of naval discipline. On the same principle that we find that our best seamen are those who have been trained in the service from early boyhood, so we believe the same of the officer; the habit of obedience, to be real, is as necessary to be learnt slowly as any other rudimentary study.

There is no doubt, morally speaking, the Navy is a trap; the victims are caught young, and the freedom from school and the cruizing about the world with all the excitement of being one in a popular profession, are sufficient to keep the boy, or even the young man lulled or pacified until it becomes too late to retreat, and at the age of forty how many are there who would not honestly confess they had made a great mistake, and if they had to commence again, at least the Navy would not be their choice. Sailors are but human, and are not void of moral obligations like others of their kind, they find out that "it is not good to live alone," and consequently they marry; then what a life is before them, the necessity, as a matter of livelihood, of continuing their profession, at variance with their natural inclination to be with those it is their duty to be with.

But it is not our intention at present to go into the after life of a sailor; our object is merely to prove that if we are to have a succession of such victims, they must still be "caught young."

We have always been of opinion that the test by which the lads are entered into the Navy is not the best for getting those most suited to the service, and, whatever may be the advantages of the competitive system in other branches, it is not adapted to boys of twelve and thirteen for the Navy. True, it is said they all know what is before them, and as there is no favouritism, there is no unfairness. Well, we may say, "it is said," for it is a fictitious argument at the best for the boys, and none know it better than those who, next to the boys themselves, are most deeply interested

in the matter, viz., those that prepare them for their competition. "Crammers" they are called, and in most cases "crammers" they know themselves to be, for they would own from their experience that not one boy in ten has, at the age stated, got hold of what may be called the towrope of his studies, and that all he acquires that is in any way distasteful to him is driven into him; the great art being to get him just up to the mark for the examination, without regard to the ground work of all he has learned; this is not only injurious to the lad himself but injurious to the service he joins.

Another point which seems unjust to us in the examination of boys for entry as naval cadets is that, whatever their age may be, they are all placed on the same footing. We all know that a parent or guardian must take a nomination when he can get it, as if the offer of one is declined, or the application for one delayed, the opportunity may be gone for ever; consequently it is quite possible to have boys just twelve and others thirteen, to even thirteen and a quarter, competing for the prize. This we do not consider fair or just; as in a yacht race, time is allowed for diminished tonnage, so it seems to us, numbers should be allowed for every three months' difference of age. We think this is so apparent that we can only wonder an equalization by its means has not been before attempted.

In proposing the age between fourteen and fifteen, we do not say that it would alter the case beyond this,—that we believe that if there is any age in life which will decide a lad's fate, it is between the ages of twelve and fifteen; in that two or three years all he acquires by his natural talents is dependent on the grounding he has had previous to it and which is better learnt at school than in a training ship; it is the period at which he does get hold of the *towrope*, and sees the advantage of holding on well, and not only is the mind formed, but the body is developed by that age, and the boy is more fitted to "go in and win."

With regard to the entry, the preliminary test should be as to ground work only; no catch questions should be allowed which give an advantage to a boy specially prepared to meet them, for we know that every one of the kind is carefully stored by those who prepare the lads, and they are taught to look out for them. The second or entry examination should not be confined to three subjects as at present, but be free to all, and where a boy excels in one, his extra numbers should go to balance those he is deficient in, for we know how often it is the case that a lad may make rapid progress in mathematics, and not be able to master the conjugation of a French verb; another may be a good classical scholar, yet fail to remember

the date of the birth or death of a king: and should we lose the good mathematician or scholar simply because he fails in minor matters? We have known cases where a lad could have gone far beyond his trial in mathematics but was not permitted, and yet he was plucked for a want of knowledge of Scripture history or geography, the examination in the latter subjects consisting of some half dozen *viva voce* questions, out of which he could not answer a certain number.

After entry, the nature and progress of study is the most serious consideration, for if the theoretical education is carried too far, it is at the expense of the practical, you cannot make a book-worm and a seaman at the same time. We once heard it remarked of one who had taken three first class certificates, and consequently was at once promoted, that he could not be trusted to lay out a kedge anchor; now this is not what we want, therefore the necessity of determining how far theoretical knowledge is required,—and we think that this could be answered by saying, as far as it is necessary to fit the man for his duties as an officer and a seaman, and in mathematics, gunnery, steam, practical navigation, surveying, etc.,—is a most important consideration.

In any scheme for the education of officers in the Navy there is one point which we consider a great desideratum, and that is, the separation of those who excel in mathematics, mechanics, etc., to form a corps of marine engineers: to these should be entrusted the construction of lighthouses, removal of bars or rocks, cutting ship canals, surveying, etc.; in fact to be to the Navy, what the Royal Engineers are to the Army. At present we at times see soldiers entrusted to do what is in reality sailors' work.*

The long disputed subject of the retention or abolition of the navigating class also came under the discussion of the House, and it seems to have been decided for the present, that the class is to be retained; this being the case we may express our satisfaction at the remark made by Captain Egerton, viz., that "greater opportunities than they now enjoy should be afforded to these meritorious officers of obtaining the prizes of the profession."

That the status of the navigating class has been greatly improved of late years we admit, still some disabilities cling to it which cause rankling at the heart, and which must be removed before those belonging to it will work in harmony with the other branch of the executive. As we believe these disabilities could be removed without ill-feeling or injustice, the sooner it is done the better.

The navigating officer has no wish to take the command of the

* The Royal Engineers are frequently employed in submarine operations.—Ed.

ship out of the hands of the lieutenant, but while on board ship he does object to be considered junior to a lieutenant, that is, junior to him while there is a commander or a lieutenant senior on board; and also when in absolute command of a ship, whether as staff-commander or navigating-lieutenant, he does object to be considered junior to his fellow of the other line who commands another vessel, and we believe it is injurious to the service that it should be so: an instance occurred not long ago which proves the assertion. A young lieutenant took, by his own order, men out of a ship commanded by a staff-commander, contrary to the expressed wish of the latter.

The value of the navigating class is always admitted, yet they have always been kept subservient to the other; that this arises from the fact of their having no exponent at head quarters, we can well believe, for the advisers of the First Lord for the time being, are all of the other branch of the service, and one may only compare it to an enquiry from one man where the shoe pinches on the foot of another. We believe the late First Lord did consult the man that wore the shoes, and much good was effected by the enquiry, and we hope Mr. Goschen will do the same, and then we do not doubt that well weighing the pros and cons of the questions, the disabilities we have hinted at will be swept away, and that by their disappearance much good will accrue to the service.

One point the navigating class feel deeply, especially when it was the professed intention to equalize the classes in the matter of retirement, viz., that while the maximum retirement of the Chaplain and Naval Instructor and Paymaster is £450, that of the Staff-Commander is £400.

One remark more we may make in connection with this subject, and that is, the want of faith on the part of the Admiralty to this class. An Order in Council says, there shall be fifteen staff-captains, at present there are only thirteen; the same Order in Council establishes the number of navigating-lieutenants, the list at the time of writing this is below that establishment, and consequently entails bitter disappointment on the navigating-sub-lieutenants, many of whom have served six years in that capacity. Athough the words *may be* were inserted, it was not supposed it would be meant for *nil;* it says, "a number of navigating officers, not exceeding in all three annually, may be promoted from the ranks of staff-captain, staff-commander, navigating-lieutenant, or navigating-sub-lieutenant to be captain, commander, lieutenant, or sub-lieutenant respectively, under such regulations as we may prescribe"; although this is dated a year and a quarter ago, not one has been so promoted.

MERCHANT SHIPPING LEGISLATION.—V.

CRIMPING.

(Continued from page 452.)

New York.

The greater part of the shipping trading to New York is British; it is therefore worth our while to take a glance at crimping there.

When we say that for crimping New York recently carried and probably still carries the palm from every other port in the world, we do the crimps of that rising place but scant justice, and we convey to the reader no adequate idea of the perfection and enormities of the system there. The New York crimp, generally an American Irishman or an Irish American, looks on British ships and British seamen as chattels created and sent to New York by a beneficent providence or by a supervising devil for the special enrichment of a crimping community.

As a matter of course when the science of crimping is brought to such perfection as in New York, the crimps attain and maintain a certain standing in society.

The crimps of New York have assumed and maintained the sole right of supplying seamen to ships, the regulation of their wages and advances, and of everything connected with the employment of seamen engaged there.

Quarantine regulations, ordinances, and laws are alike defied as soon as a ship is signalled as entering the Bay. The runners, or touters hurry out, get on board, and soon get hold of the seamen. The result is inevitable. Desertion, or litigation as to the terms and construction of the agreement. If seamen are not in demand then drink and temptation only are resorted to by a crimp, if the seamen are in demand, then they are taken off bodily by force of numbers and revolvers, sometimes even before the ship is anchored. If the master and officers resist in such a case, they have to make a real fight of it, and have been overpowered and beaten without being able to obtain redress. They have also to look out for the crimp's revenge ashore.

The crimps in New York were powerful enough to prevent for some years the passing of certain amendments of the law relating to merchant seamen, and now those amendments are passed, the crimps are able to set them aside with impunity. The crimp here as elsewhere keeps the seaman tight in custody, gives him a tre-

mendous turn at drink and debauchery, gets his money and clothes, and ships him after getting his advance. The same story with but slight variations all the world over.

Marseilles.

This port may be taken as an illustration of a crowded port in the south of Europe. It is visited by about 10,000 steam and sailing ships, making a collective tonnage of entrances and clearances per annum of about 3,500,000 tons. It is close to Cette where the entrances and clearances per annum (before the late war) were about 1,250,000 tons.

There, as at Cardiff, New York, Callao, etc., we find a miscellaneous collection of seamen—Englishmen, Scots, Hibernians, Germans, Swedes, Norwegians, Greeks, Italians, Russians, French, Spaniards, Portuguese, Indians, Negroes, Americans, Americanised Britishers, and even the "heathen Chinee,"—arriving, deserting, quarrelling, debauching, and departing indiscriminately and indifferently in vessels belonging to their own or any other country. Here also we find that the various treaties and different practices of the consulates of the various maritime countries, as regards desertion, wages, leaving behind, recovery of deserters, etc., etc., not only assist in increasing the general confusion, but often enable the seamen to desert and masters otherwise to disobey the law. The dishonest master when so inclined, appropriates the wages of seamen with impunity, and the crimp with equal impunity makes an enormous profit out of both seaman and master.

It would be beside our purpose to particularise any special case or to follow any seaman through his "Course" at Marseilles. It is the usual routine. The seaman arriving with pent up desires, is quite ready and even anxious for dissipation; and the crimp is ready and anxious to find for him the means. It is the whim of some persons to regard the seaman as an innocent martyr in the hands of the crimp, but as a matter of fact this is seldom the case. The sailor and the crimp are both rogues together, but the sailor is the flat rogue, and the crimp the sharp one. The sailor generally ready to receive drink at the hands of the crimp, and to listen to his proposals for ready dissipation and debauchery ashore, soon makes up his mind to "have a fling," and desert with his clothes if he can, without if he cannot: but this is not all—we are sorry to have to say so—sometimes another rogue, the master looks on, aids, abets, and profits by the wages forfeited by desertion. If the men do not desert, but if they and the master agree to separate by

mutual consent, it may be still better for the crimp, for the seaman will have more money. This will however of course only be in the case of homeward bound ships. When such a mutual separation does take place, and the men have wages to receive for several months' service, as much as £200 or £300 may in the short space of a few hours, and out of one ship, be sown broadcast in the stews and brothels of Marseilles. It is not surprising to find that the chief crimp of Marseilles recently retired with a competence.

As regards the master, he as is shewn, not unfrequently becomes friendly with the crimp, drives about with him and indulges in a little second class dissipation on his own account, in which he finds the knowledge and resources of the crimp (who is as a matter of course in close connection with some establishment where frailty resides) of infinite service. A master may be kicking about in Marseilles for two or three weeks, and the seamen's wages forfeited by desertion, and the kindly interest of the crimp afford him very comfortable means of indulging after the fashion of the Marseillaise.

When his ship is ready his friend the crimp sorts up a crew for him, if necessary by getting deserters from other ships: the crimp's emolument for this last service being the advance notes of the seamen. The master has not altogether had an unpleasant time of it, and the wages of the crew have as we have seen for two or three weeks been saved to the owner. The ship goes to sea with an odd assortment of creatures for a crew, many of the members not knowing the language of the others, all more or less drunk, and in due course—the underwriters settle with the owners.

This is not an exaggerated or highly coloured statement, for we have the very best authority for stating, that fully one half of the masters of British ships at Marseilles do not enter unwillingly into dealings with the crimps.

Cardiff.

We make special reference to Cardiff, Liverpool, and London, to shew how much may really be done by vigorously attacking crimps. Cardiff until recently, possessed an unenviable notoriety, for according to the testimony of the Cardiff Chamber of Commerce, it was in 1866 "notorious for the desertion of seamen."

A report was also made to the Board of Trade, that the practice of harbouring and secreting deserters had attained a magnitude at Cardiff beyond any other port in the United Kingdom. The results of this were a general scarcity of seamen there, considerable

local irritation, and a steady demoralization of the seafaring community.

The boarding-house keepers (crimps) of Cardiff were found to be a powerful body. They were combined by a common "Protection Society," which employed advocates for the defence of its members when prosecuted for breaches of the law. They had a regular establishment of runners, who kept a look out for ships and visited them for the purpose of corrupting and decoying away the seamen. The local authorities were, it is said, unable to combat their influence over the crews of ships arriving at Cardiff, whom they almost invariably succeeded in enticing to their houses, described as haunts of an infamous description, the evil of prostitution being greater in Cardiff (the amount of the population considered) than in any other port of the United Kingdom. The crimps' remuneration here as elsewhere was to a great extent the seaman's advance note, which they discounted at a ruinous loss to the holder. If he got £1 for a £3 note he did well. To obtain this their source of gain they would stick at nothing. They had been known to board vessels in broad daylight and to remove the crews in the faces of the officers. A case is adduced in which a vessel was boarded from another lying beside her in the basin, by as many as one hundred crimps, who in less than two hours had decoyed every man from the ship, leaving the master to get substitutes to take her into the docks; or they would steal the crews at night, and this too, sometimes when the vessel had left the docks, and was lying in the roads, waiting for the morning tide in order to proceed to sea. Under these circumstances, the unfortunate shipmaster deprived of his crew, was obliged to pay large sums of money to get them back again, or to lose both time and money, in endeavouring, with the aid of a search-warrant to trace them out. This, considering that Cardiff contained one hundred and fifty boarding houses, and that the crimps had besides, lodgings far out of the town where they were in the habit of hiding deserters, was never an easy and seldom a successful task. In the long run the master was forced to content himself with such a crew as the crimps would provide him with. The men so obtained, sent on board in a drunken and diseased condition, were often wholly unfit for duty.

Many instances have occurred in which the vessel so manned has been unable to go to sea, or she has been taken down channel by "riggers," hired to do the work of the incapacitated crew.

In all these cases the real offender (the crimp) generally escaped scot-free. There was no want of legal power to punish him; but from the indifference of those concerned, from unavoidable delays,

and from the difficulty of obtaining direct evidence that the crimp knew the seamen had deserted, there were obstacles in the way of securing his conviction.

The advance note was the object of the crimp's cupidity; and the advance note was not unnaturally looked to as the root of the abuse.

A vigorous executive since 1866, the appointment of an additional staff at the Mercantile Marine Office, a "Caution" to licensed shipping agents, and several successful prosecutions of crimps has caused the system to be less lucrative than formerly.

It is encouraging to find by an extract from the *Cardiff Times* of the 1st April of the present year, "that even London and Liverpool shipowners admit that the system as now pursued here under the direction of the Board of Trade, is one of the best for these purposes."

Liverpool.

The suppression of crimping at this port is to be attributed to the active measures taken prior to 1867, by the Liverpool Local Marine Board and the Mersey Docks and Harbour Board, favoured by certain local facilities for controlling the entry of homeward bound vessels into the port and docks. "Whilst shipping agents, either licensed or unlicensed, were allowed to be employed at this port," says a letter from the Local Board dated 14th March, 1867, "Crimpage in its worst form prevailed. The Local Board therefore recommend the total extinction of the system of shipping seamen through licensed agents, and afterwards established an out-door staff under their immediate supervision to supply seamen to British ships." As however unlicensed shipping agents still found employment in supplying seamen to the various American ships frequenting Liverpool, they still with the connivance of masters continued to supply them surreptitiously to our ships also. The Local Board accordingly further increased the outdoor staff, and the evil, on this side, ceased. The outdoor staff was however unable to prevent the boarding of the vessels in the Mersey by crimps and their allies; and it was perceived that unless this could be put a stop to, the good already done would be neutralised. With the co-operation of the Mersey Docks and Harbour Board, a river police was therefore set on foot; and this body, acting in concert with the officials of the Local Board now successfully regulates the engagement and discharge of seamen at the port of Liverpool. The Local Marine Board in 1867, declared themselves to be thoroughly satisfied with the results of the system. The vigorous and harmonious co-operation of the various authorities in Liverpool afford an example worthy of imitation by the authorities in London.

London.

We now come round again to London, and here we shall see how at least, one set of the crimps' retainers have been worsted by the vigorous steps recently taken, even if the London crimps themselves have not suffered much. The Superintendent of the Thames Police reported in 1867, "that the evils complained of had become at the Port of London of greater magnitude than before the Act of 1854 came into operation, and this although the provisions of the Merchant Shipping Act, 1854, had, in part, been directed against the crimping system; and although a temporary check had been given to it by those provisions."

The crimping system of London is mainly sustained by the boarding-house keepers and a certain class of Jew slop sellers acting in concert. These persons maintain, as their commission agents, a large body of men, consisting chiefly of thieves, pugilists, bullies, and vagabonds of the lowest description, who prowl about homeward-bound ships and seamen arriving. These men are vulgarly known as "hammock snatchers," probably from the fact that their practice is to secure the seaman's luggage in the hopes that he will follow it.

The practice of these last, many of whom kept boats at Gravesend, was to lie in wait for homeward-bound vessels coming up the Thames from long voyages, whose crews might be expected to be entitled to large arrears of pay. We say this was the practice, for at present it has been stopped at Gravesend, as we shall explain below. If they did not meet with any opposition they would board these vessels (sometimes as many as twenty entering together), and, plying the crews with spirits, they would then make every effort to induce them to promise to board with their employers. Sometimes they came up the river with the ship to keep their victims under surveillance; sometimes they proceeded to town by train to meet them with carts at the Dock gates. The seaman stupified with drink was forced into public houses whilst the crimps fought for him and for his luggage. Finally, he was carted off and sold as a lodger to the boarding-house keeper, who bid for and bought him at the highest price, a price varying ordinarily from eight shillings to ten shillings per head. Money was then advanced to him by these worthies on account, and by this means he was kept under their thumbs, always in a semi-intoxicated state.

The ship-owner does not, like other employers of labour, pay wages when they are due, and so a seaman has to wait about idly for his money, and is in the crimp's hands and lies at his mercy, as

shown above. In a few days after pay day, not unfrequently on the first, he was and still is often fleeced of all he had received.

The system was thoroughly organized; and so numerous, so determined, and so reckless of consequences were the crimps, that officers of inward-bound ships, when desirous of doing so, were wholly unable to contend with them. That some officers of ships took and still take no proper means, or no means at all, to keep crimps off ships is proved by the fact that at the present time, week after week, the police find crimps on board of homeward-bound ships at Gravesend. In 1867, Vice-Admiral Bowles, the president of the Dock Street Sailors' Home, called attention to this increasing abuse, and suggested a strict supervision of inward-bound vessels. Messrs. Wigram had for some time employed a constable in this way on their own ships with entire success. An inspector and three constables were at the request of the Board of Trade appointed by the Home Office, and the expense of maintaining them is borne by the Mercantile Marine Fund.

The duties of these men are confined to vessels arriving in the Thames from long voyages. By the police orders they are to enforce the provisions of "The Merchant Shipping Act, 1854," for preventing crimps and other improper persons from getting on board such ships without the consent of the officer in charge, and to eject and take into custody, as circumstances may justify, any crimps or improper persons who shall have got on board without such consent.

The police are either put on board at Gravesend by a waterman especially employed on this duty, or they attend at the dock entrance where the ship is expected to arrive.

Their intervention down to the present time has been attended with good. In most cases the crimps do not now attempt to enter the vessel if they know the police are on board.

If they have already boarded her below Gravesend they leave when the police appear. Several of the crimps who had boats and residences at Gravesend have recently parted with both and returned to London, while some who were located in London are now, it is said, seeking other employment. This police interference has certainly checked the evil as far as it has touched it: but it touches it partially only, and grave doubts exist in some minds whether the successful efforts against crimps at Gravesend have done more than to change the field and method of the crimp's operations. The crimp can move his quarters to some spot below Gravesend, and although he leaves the ship when the police come on board there, he may during the time he is on board do, and as

a matter of fact, he does much mischief. And again, we certainly know that one of the results of the supervision at Gravesend has been to increase the activity of crimps in London itself, where the steps taken have been and still are imperfect.

The Ghaut Serang.

Even the Eastern mind has so far adapted itself to modern requirements as to enter with spirit and with profit into the mysteries of crimping. The special form assumed by crimping among Asiatic crews of British ships, is called the "Ghaut Serang." The following brief sketch, derived from a memorandum on the question drawn up in 1859 by the Hon. Secretary of the Strangers' Home for Asiatics, may serve to convey a general idea of it.

It is proper to preface this narrative with the statement that the document from which it is derived is dated some years since. During the interval of time local legislation has, in some degree, crippled the Asiatic crimping system. Complaints on the part of lascars, and desertions in the United Kingdom, have been fewer; but that the Ghaut Serang system will again demand attention must be evident from the case of the lascar crew of the *Kalodyne*, reported in the *Times* of the 3rd November, 1870. "The snake is scotched, but not killed." We shall therefore not be wasting our time in perusing the following curious statement:—

A vessel, we will say, is chartered at Calcutta, to load on the Tenasserim coast, for a voyage to the United Kingdom. The master requires a crew of lascars, and applies at a Government shipping office; here he is referred to a ghaut serang, or shipping agent, whose functions in that capacity are to a certain extent recognised by the authorities.

The crimp assembles a crew, who are submitted to the master by him. The master selects the number of men required, explains the agreement he proposes to make with them, arranges for the payment of allotments to their families, and, upon their demand (made, of course, at the instigation of the serang), gives them a considerable advance of wages. If the demand is acceded to, a day is fixed for the men to receive their advance of wages and to be on board, the ghaut serang being responsible that all are present on the day specified, for which he receives a commission of 7½ per cent. on the total amount of the wages advanced.

In the meantime the bond for the payment of family allotments is executed, articles of agreement are drawn up by the shipping master, and the four months' advance of wages paid to the crew

through the ghaut serang, who arranges the amount of each man's wages, deducts the authorised fee to be paid to the shipping master, takes his own and the schroff's "dustooree,"* or custom, from every man, with each of whom he makes the best bargain he can and appropriates any balance of the four months' advance paid through him, as his perquisite; the signature or mark of each of the crew being attached to the articles, under his direction, many being ignorant of the amount of wages to which they have affixed their mark or signature.

On the day fixed the crew are brought to the ship, anchored in the river, in a steam tug hired to take the ship out to sea. On mustering the crew after they come on board, and on reference to the articles, the master finds that at least ten out of the thirty are new hands whom he never saw before, shipped and sent by the ghaut serang in place of others who would not go on his terms, or had deserted. The new hands are chiefly river boatmen or landsmen, picked up at the last moment, who have never perhaps been at sea before, cannot go aloft, and are ignorant of the duties expected from them; whilst some, after being a few days at sea, are found to be suffering from disease and unable to work.

The ship, however, is ready for sea, the steamer engaged to take her out of the river is alongside, and the tide near the ebb; if detained, £25 or more, demurrage must be paid. The master must either go to sea with the crew on board, or be put to the expense of two or three days' demurrage, with the inconvenience, loss of time, and expense of going up to Calcutta to get proper seamen, obtainable only through a ghaut serang.

The former, being the least expensive and troublesome, is chosen. The ship goes to sea with twenty instead of thirty efficient seamen, for all of whom four months' wages in advance has been paid as able seamen. In ten or twelve days the ship arrives on the Tenasserim coast, and, when nearly loaded, the men ask for money, and are told that having received four months' wages in advance, no more can or will be given to them. It then appears that many of the crew have not received above half, some only one-fourth of the advance paid to be issued to them; others were shipped for their food only and for any wages that might be given to them, but as the master refuses to advance any more, several desert. The police

* The "dustooree" usually taken by the ghaut serangs in India, Ceylon, and on the Tenasserim coast, from every man when shipped, is 10 rupees and upwards for four months' advance, 7 rupees for three months', and 5 rupees for two months' and short voyages. At Singapore and in China it is 2 to 5 dollars, according to the amount advanced.

are applied to, some are caught, confined in jail, and sent on board just before the ship sails; others get off and hide themselves till after the ship's departure, and thus, in almost every vessel, are one and two months' wages of several men lost to the ship.

But before the ship can leave the Tenasserim coast for the United Kingdom, the master must complete his crew, and exchange those found incapable from disease or other cause, though at the loss of the balance of their wages paid in advance at Calcutta. To all the fresh hands he has to give an advance of four, and never less than three, months' wages under exactly the same system as above detailed, and with these the ship sails to the United Kingdom, some being found equally incapable as those deserted or discharged. On arrival in the United Kingdom some of the crew (who from incapacity have been made the butt of, and knocked about by, their own comrades, as well as punished perhaps by order of the master) immediately desert, hide themselves in some house of ill-fame, are sent out by their protectors to beg in the metropolis or country, and either soon die from the effects of the climate and the life they lead, or, taken up for begging, are sent to a workhouse, and from thence, according to the Act of Parliament, are sent to their homes, at a great and unnecessary expense, by the Government of India.

If the lascar returns in his ship to his native country, the ghaut serang intervenes at the final settlement of his wages with new levies of dustooree. Practically the unfortunate man receives nothing, or next to nothing, and he is so completely in the power of the crimp that he submits to any exaction rather than lose the chance of future employment, which the ghaut serang alone can procure him. Add to this that the allotments to his family are, in many instances, never paid, or if paid at all, are considerably attenuated by further deductions of commission.

It should be noted, too, that the ghaut serang is not the sole person who plunders the lascars. He sells the right of accompanying the men on the voyage to an inferior blood-sucker—the serang or boatswain of the crew. This person is exempt from payment of dustooree to the ghaut, and makes levies from the crew on his own account. Thus the wages due to the men are reduced to a minimum; in some cases, as has been said, they amount to nothing at all. If the men shipped by the ghaut serang are river boatmen or landsmen, they engage themselves to him for their food only, getting perhaps a rupee or two, or a little clothing as a favour. Any advance made on their account by the master is confiscated by the ghaut, and the serang of the crew appropriates all sums paid to them during the voyage.

We trust we have now written enough to impress our readers with the fact that crimping not only exists, but that it is universal, and is an evil that demands vigorous treatment at the hands of the legislature and the executive. It is not necessary, for our present purpose, to enlarge further on the special features assumed by crimping in each country and in each port. If it were necessary we could go on until we filled a large volume; we could shew that Shanghai by its crimping gave to a certain phase of it the name of Shangaing, and we could shew that Calcutta, Quebec, and many other ports, were but recently, and perhaps are, but a little way behind New York and Marseilles.

A crimp regarded purely as acting simply as an agent for bringing employer and employed together, may not only be a law-abiding, but really a useful person. A lodging-house keeper, letting decent lodgings at a sum sufficient to return a fair profit, may also be a law-abiding, and is a most useful person.

When the lawful agency of the agent gives place to dealing in and selling those who seek his agency, his actions become unlawful and immoral. And similarly, when the lodging-house keeper acquires his lodgers' property in an unauthorized manner; when he systematically makes excessive and fraudulent charges; when he encourages and makes a profit out of debauchery and immorality generally; and when as a part of his business he makes special provision for the employment of improper and unclean women; his actions become unlawful, immoral, and dangerous.

We shall in our next number proceed to review the statute law applicable to crimping, shewing how far and why it is inadequate, and having done this we propose to consider how far, if at all, the services of an agent for supplying seamen are necessary.

(To be continued.)

ADMIRALTY SURVEYS.

THE following brief outline of the Hydrographical operations which have been carried out, under the Admiralty, on home and foreign coasts during the past year, is from the anniversary address of the President of the Royal Geographical Society, as communicated by Rear-Admiral G. H. Richards, C.B., F.R.S., Hydrographer.

Upon the east of England, Staff-Captain Calver and his three assistants, in H.M.S. *Porcupine*, were engaged, during the early

part of the season, at the head of the Lynn Deeps, in furtherance of a complete re-survey of that extensive estuary known as the Wash, wherein many important changes had occurred since it was examined by the late Captain Hewitt, R.N., upwards of forty years since.

During the middle and latter part of the summer the *Porcupine* resumed her interesting occupation of the previous year in the scientific investigation of the deep sea. The objects proposed on this occasion were a minute survey, physical and zoological, of the Atlantic slope along the coasts of Spain and Portugal, of the Strait of Gibraltar, and along the shores of the Mediterranean as far as Malta. The results, so far as the examinations extended, were eminently satisfactory; many interesting observations were made on the temperatures at various depths, and much new light thrown on the systems of ocean circulation and the connection between the currents of the Mediterranean and the Atlantic Ocean.

Some very valuable observations were especially made both of the surface and under-currents in the Strait of Gibraltar by Dr. Carpenter, aided by the practical skill and ready resource of Captain Calver, with the view of settling this important problem; but, over so wide a field of research, it is obvious that much must still remain to be done before any fixed and satisfactory laws can be laid down and finally recognised; and for this we must hope for future investigations. It may be mentioned, in connection with submarine currents in this region, that the Falmouth and Gibraltar cable, which was laid in June, 1870, and which failed to work a few months since, was found, when recovered, to have been chafed, in several places, as fine as a knife-edge, which, by those engaged in its recovery, is attributed to the action of a considerable current over a rocky uneven bottom: this opinion, however, is as yet by no means clearly demonstrated. The fracture in the cable occurred in a depth of 500 fathoms of water, 100 miles westward of the Strait of Gibraltar, and about 60 miles south of River Guadiana, where the surface current is not considerable.

For a full and scientific account of these researches, the reader is referred to the narrative drawn up by Dr. Carpenter and Mr. Gwyn Jeffreys, published in the "Proceedings of the Royal Society," No. 125, Vol. xix.

H.M.S. *Lightning*, under Staff-Commander John Richards, whose services are devoted to the western shores of England and the coasts of Ireland, was specially diverted from this service, during the early part of 1870, for the purpose of minutely surveying a section of the Strait of Dover, between the South Foreland and

Cape Grisnez, with a view to possible engineering operations. The survey was carried out by running continuous lines of soundings from the neighbourhood of the Foreland to within three miles of the French coast.

Along the three central lines of this section soundings were obtained about 400 feet apart, the bottom being probed at each cast (by a machine, constructed for the purpose, weighing 7 cwt.) to an average depth of 8 inches, and specimens of the soil brought up. It may be interesting to state further that, on the oozy bank off Dover, the probing machine penetrated to a depth of nearly 5 feet, while in the offing 14 inches was the greatest depth reached, of which 6 inches consisted of drifting substances, such as gravel, sand, stones, etc., overlying 8 inches of chalk, the upper part of the latter, generally soft, hardening with the descent. Numerous fine specimens of chalk, of various colours, were obtained. But frequently the machine would not penetrate at all, and in some cases, where the attempts were repeated, the lower part of the probe was repeatedly broken and destroyed by contact with the hard bottom. The substrata of bottom of the Channel from the Foreland across to near Cape Grisnez was found to consist entirely of chalk, but varying much in density as well as in colour; white and grey prevailing near the Foreland and in mid-channel, and brown as Cape Grisnez was approached. Veins of soft chalk, resembling pipeclay and varying in colour according to situation, were occasionally met with: but the general character of the ground was hard and very uneven, especially from mid-channel towards the French coast, where the great strength of the tidal stream appeared to have swept away drifting substances, and even to have hollowed out the soft veins of chalk, leaving only the hard ridges between.

The result of this survey seems to prove, from the unevenness of the ground and the strength of the current, unfavourable to a scheme which has been proposed of connecting this country with France by an iron tubular subway, though not unfavourable to a tunnel.

During the latter part of the season the *Lightning*, under Staff-Commanders Richards and W. B. Calver, was occupied in making a new survey of the estuary of the River Dee and its approaches, which were found to have much changed since the survey of 1859.

The Survey of Portsmouth and its neighbourhood has been conducted by Staff-Commander D. Hall, with a steam launch and a small party. During the past season a minute measurement has been made of the depths on the Bar of Portsmouth Harbour, an

operation which it is highly necessary to make periodically, in order that timely measures may be taken to maintain the channel at a depth of 20 feet, or nearly so, at low water.

These successive examinations have shown that the deepening of the entrance to our greatest Naval depôt, which was effected by dredging between the years 1858 and 1863, has proved a great success: nevertheless, some further dredging operations are required, principally to carry out conditions not strictly fulfilled on the occasions referred to.

Now that the bed of the Channel has assumed a position of perfect rest, it is most desirable that these operations should not be delayed.

Commander Hall has also re-surveyed the Medina River on a large scale, with the view to deepening certain parts of the channel by dredging; and plans on 30 inches to a mile have been constructed of the upper portions of Portsmouth and Langston harbours, showing the connecting channel facing Hilsea lines which has been excavated for the passage of gunboats.

Tidal diagrams have also been constructed, with the view of showing the probable effect which would be produced on the bar of Portsmouth by connecting the tidal waters of the two harbours.

Mediterranean and Red Sea.—Captain Nares and the officers of H.M.S. *Newport* have been employed during the last summer in prosecuting the survey of the coasts of Sicily and the coral-banks between it and the coast of Tunis; a suitable channel was descried south of the Skerki reef, through which the telegraph-cables connecting Gibraltar and Malta, and the latter with Bona, have been successfully laid.

In consequence of the increased traffic through the Red Sea since the construction of the Suez Canal, a re-survey of the Gulf of Suez became necessary, and the *Newport* was detached from the Mediterranean on this service in September, since which time the survey has been vigorously prosecuted in the face of many difficulties: very considerable progress has already been made, and the ship is about to return, until the cool season again sets in, when she will be replaced by a vessel more suited to cope with the weather and the climate of the Red Sea.

In compliance with a request from the Indian Government that a re-survey should be made of the port of Aden, previous to the dredging operations about to be undertaken for increasing its capabilities, Navigating-Lieutenant Ellis was sent from England in October to carry out this service, which has been satisfactorily completed.

West Indies.—Navigating-Lieutenant George Stanley has succeeded Staff-Commander Parsons in the conduct of this survey, and has been employed during the past season, with one assistant, in extending the survey of Demerara, which was commenced in September, 1869.

The approaches to the Rivers Demerara and Essequibo, with the adjacent coast, having been completed, the surveyors have lately been employed in obtaining off-shore soundings on the extensive bank which fronts British Guyana, an operation of a very arduous and tedious character, in the small sailing-vessel at their disposal.

Newfoundland.—This survey is conducted by Staff-Commander J. H. Kerr, aided by two assistants, and is carried on during the summer season in a small hired steam vessel. A portion of the last season was devoted to sounding the eastern approach to Belle Isle Strait, when the limit of the 100-fathom edge of the bank was well defined, in the interest of the line of passenger-vessels which run between Liverpool and Quebec, and adopt this route during a part of the year. The fogs which are so prevalent on this dangerous coast, and which, in addition to the presence of ice, enhance the difficulties of navigation, give an increased value to these soundings as a guide to the mariner: with the same view, depths have been obtained on the hitherto blank spaces in the charts of the Gulf of St. Lawrence. During the latter part of the season, the surveyors were engaged in defining and charting the numerous dangers in the neighbourhood of Bonavista Bay, on the eastern coast of Newfoundland.

In the depth of winter, Commander Kerr and his assistant aided in several attempts to recover the broken Atlantic cable, but, owing to a constant succession of storms, intense cold, and the prevalence of ice, their efforts were unsuccessful.

British Columbia.—Staff-Commander Pender and his two assistants have been employed during the past season in examining the rugged western seaboard of the islands which front the coast of British Columbia, northward of Vancouver Island; which have been completed, as well as the inner and sheltered ship-channels of communication, as far as the northern boundary of the colony, in 54° 40′ N. lat. Additional soundings have also been obtained on the bar at the entrance of the Goletas Channel, at the north end of Vancouver Island, and re-surveys, on a large scale, of Beecher and Pedder bays, at the eastern end of St. Juan de Fuca Strait. This survey may now be considered complete, and sufficient to meet all the requirements of the navigator and the settler for many years to come, and the party have been consequently withdrawn.

Cape of Good Hope.—During the past year this survey, under the conduct of Navigating-Lieutenant Archdeacon, has made excellent progress: the coast has been completed from Lambert Bay, northward, to a few miles beyond the Orange River, a distance of about 250 miles, although, from the want of a vessel, it has not yet been possible to complete the soundings off it.

Great hopes were entertained that the entrance to the Orange River would have proved navigable, thus opening up a new and shorter route to the lately-discovered diamond fields: such hopes, however, were not realised, the entrance having been found obstructed by an extensive sandbar, and the river within, for several miles, a mass of sandbanks.

A survey, however, of Port Nolloth, about 50 miles to the southward, has been executed. It is a small, but very safe harbour for vessels of light draught, and is becoming of considerable importance to the colony as a port of shipment for the copper-ore obtained from the mines which are situated about 90 miles from the coast. "Great credit," Mr. Archdeacon remarks, "is due to the Copper-mining Company for the energetic manner in which they are carrying out works for developing the mineral wealth of this otherwise unproductive tract of country: a steam tramway is in course of construction from the port to the mines, 40 miles of which were completed and in working order at the end of December."

This surveying party has undergone considerable hardships and privations, consequent on the scarcity and extreme saltness of the water, and the almost entire absence of inhabitants in the vicinity of the coast, where the country is little better than a barren sandy waste.

South Australia.—During the early months of 1870, Navigating-Lieutenant Howard and his assistant were employed in a small colonial schooner in sounding the neighbourhood of Tipara Reef in Spencer Gulf, and examining the northern coast of Kangaroo Island, between Point Marsden to Cape Borda, a distance of over 50 miles.

Subsequently the coast was surveyed from the mouth of the Murray River to Cape Jaffa, 40 miles south of Lacopede Bay. Mr. Howard remarks of this bay that, although quite open to the westward, it is remarkable as a perfectly smooth anchorage; the swell from the Southern Ocean being entirely broken up and dissipated by the time it reaches within a mile of the beach, in four fathoms of water, even in the most violent gales. This circumstance he attributes to the very gentle undulation of the bottom, and the consequent very gradual shoaling of the water from about 10 miles off-shore up to the beach.

Later in the season the coast line was completed from Cape Jaffa to Glenelg River, making altogether a distance of about 230 miles of coast examined during the year; the greater part of this, owing to the impossibility of effecting a landing from boats, was carried out by shore parties, and the off-shore soundings still remain to be completed. On this work the surveyors are at present employed.

Victoria, Australia.—Navigating-Lieutenant H. I. Stanley, aided by two assistants, has completed the line of coast known as the Ninety Mile beach, or Gipps' Land, and carried the survey eastward to Cape Everard, a point about 40 miles from Cape Howe, the eastern limit of the colony. The greater part of this stretch of coast is uninhabited; and, as a landing could not be effected with safety, it became necessary to carry on the survey by walking parties, crossing the rivers on rafts constructed of drift timber. In this manner, and in the face of many difficulties and privations, among them the absence of fresh provisions, 120 miles of coast were surveyed in less than three months, and conspicuous beacons erected for fixing the positions of the soundings still to be obtained. In addition to the above, large-scale plans have been made of Port Fairy and Warrnambool Harbour.

The coast has been closely sounded, from Wilson Promontory to near Merriman Creek, on the Ninety Mile beach, amounting in measurement to about 400 square miles. The total amount of coast surveyed by this party during the year has been 180 miles, the greater part of which was open and exposed.

New South Wales.—It was noticed in the last annual report that the seaboard of this colony, together with the off-shore soundings, had been completed; the charts of the whole coast have since been published, and reflect the highest credit on all the officers who have been engaged in this excellent survey. Navigating-Lieutenant Gowlland, who, in succession to Captain Sidney (the officer who commenced and conducted the survey for several years), has brought it to a close, has been retained for a time in the colony by permission of the Admiralty, for the purpose of completing the inner waters, and has lately finished the survey of Clarence River.

Queensland.—Staff-Commander Bedwell, who is in charge of this survey, has, with one assistant, in a small colonial vessel, carefully examined and surveyed the shores of the colony from the northern part of Hervey Bay almost to Port Curtis, a distance of about 140 miles; and this stretch of coast has been closely sounded to a distance of 25 miles off-shore.

Eastern Archipelago.—Under this designation are included the Sulu Sea and the channels among the Philippine Islands leading

eastward into the Pacific Ocean—the passages southward into the Sea of Celebes, the Moluccas—and Banda and Arafura seas towards Australia. It must be acknowledged that the term is sufficiently comprehensive, and the information which we possess regarding it as a navigable region is at present extremely imperfect. Looking to the prospect of an extensive commercial intercourse springing up between China, Japan, and the Australian colonies by these routes, the work has scarcely been commenced too soon.

H.M.S. *Nassau*, under the command of Commander W. Chimmo, was fitted out last year, and left England in May to commence this great work. The ship passed through the Suez Canal and Red Sea, making an examination there of various sites proposed for lighthouses; she then carried a line of deep-sea soundings, in depths varying from 2,000 to 3,000 fathoms, between Galle Harbour in Ceylon and Java Head at the entrance of Sunda Strait, and thence up the China Sea to Hong-Kong, for submarine cable purposes, finally leaving Hong-Kong for the scene of her work early in December. By the last accounts she had commenced her labours in the Sulu Sea.

Japan.—Commander St. John and the officers of H.M.S. *Sylvia* have been principally employed during the past year in making surveys of the intricate portions of the Inland Sea of Japan, which were most urgently required. They have completed the passages on either side of the "Conqueror" Bank, from Cone Island on the east to Mutsu Sima on the west, a distance of about 20 miles; and when this very important part of the navigation of what is now rapidly becoming a great thoroughfare, is published, it cannot fail to be a great boon to the seamen of all nations, and the navigation of the Inland Sea throughout its whole length, about 250 miles, will then be an operation of comparative ease and safety.

The ports of Matoya and Owasi, on the south coast of Nipon, have also been surveyed, and will prove valuable as harbours of refuge, for vessels caught in bad weather between the eastern entrance of the Inland Sea and the Gulf of Yedo.

Commander St. John has furnished some very valuable observations on the great Japan Current and on the typhoons which prevail in this region, and acknowledges the valuable assistance which has been rendered to him in these researches by the intelligent Commanders of the Peninsular and Oriental Company's ships, running between China and Yokohama. It is gratifying to relate, in connection with this survey, the very great interest which has been manifested in the work by the Government of Japan; everywhere the greatest possible attention and civility have been extended

to the surveying parties, and assistance in the way of guides, interpreters, etc., freely afforded.

At the request of their Government some young Japanese officers were received on board the *Sylvia*, and instructed in the art of nautical surveying and the use of instruments, acquitting themselves very creditably. A small steam vessel has also been placed at the disposal of Commander St. John, for the purpose of co-operating in the survey; and it seems not improbable that at no distant time the Japanese may take up the nautical survey of their own coasts, or at any rate materially contribute towards its completion.

In closing these brief notices of the progress of the surveys of the eastern seas, which it has been the policy of this country to pursue ever since our commercial relations with China were seriously established subsequent to the war of 1841, it is impossible not to reflect on the vast benefits which accrue, in consequence, to the commercial interests of all nations, but especially to our own, and at an expense to the country of very little more than the ordinary annual cost of two of the smallest class of vessels of war.

Summary.—The usual Tide Tables, lists of Lights, Hydrographic Notices, and Warnings to Mariners, have been issued during the past year. Of Sailing Directions there have been published a volume for the West Coast of England, from Milford Haven to the Mull of Galloway; revisions of the Channel Pilot, relating to the North Coast of France and the Channel Islands, and also of the Persian Gulf Directory. New directions have likewise been prepared for the navigation of Magellan Strait and the northern channels, the result of the late survey.

Forty new charts have been engraved and published, and over one thousand added to or corrected. Among the former may be noticed, as of especial importance to navigators, a new series of the North and South Atlantic Oceans in four sheets, and of the Indian Ocean in two sheets, on scales coinciding with the Pacific series previously in circulation; an entirely new series for the Strait of Magellan, embracing from Cape Virgin, on the east, to Cape Pillar and the Gulf of Penas on the west and north. These latter charts, on good navigable scales, are principally the results of the labours of the late Admiralty survey under Capt. Mayne, C.B.; they amount to seven sheets, exclusive of numerous separate plans of anchorages; and there is no reason now why the largest steamers, with the assistance of these charts and directions, should not avail themselves of the smooth-water route, and enter the Pacific from the Gulf of Penas in the latitude of 47° S. Lastly, it must not be

omitted to notice a new Magnetic Chart of the World, just published from materials collected at the Admiralty since 1858, the date of the last chart of the kind, prepared by Capt. Evans, R.N. Owing to extended magnetic observations in various parts of the world, and to the changing character of the elements of which this chart is composed, it is important that it should be renewed at certain intervals of years.

The present publication has been compiled by Navigating-Lieut. Creak, of the Hydrographic Department.

The number of Admiralty charts printed for the use of Her Majesty's ships and the public generally during the last year, has been one hundred and fifty-three thousand.

LIGHT FOR LIGHTHOUSES.

In our last number we published a short paragraph on "Light for Lighthouses," wherein we referred to the introduction of gas for the illumination of lighthouses, and stated that "for some time past oil gas has been successfully used at the Howth Bailey Lighthouse, County Dublin, and is said to give a very brilliant light, and efforts are now being made to utilise ordinary coal gas in England." Since then we are in possession of further information on this important subject, kindly forwarded to us by Captain Hawes, R.N., Inspector of Irish Lights, and are enabled to publish it in the form of a short account of the introduction and application of gas to Irish lighthouses.

In the year 1863, Mr. John R. Wigham, of Dublin, was requested by the Commissioners of Irish Lights, then called the Dublin Ballast Board, to report to them on the subject of the use of oil gas for lighthouses. At their suggestion he made many experiments with gas made from various oils and liquid hydro-carbons, such as paraffin, petroleum, etc. In some of these experiments carburetted hydrogen gas of the highest illuminating power was produced, and operated on, in fact, gas so rich in carbon as to be little short of olefiant gas. A large amount of light was of course obtained from this gas, but it was difficult to burn it in a manner suitable for illuminating purposes in first order lighthouse apparatus. But Mr. Wigham devised and patented a burner by which this difficulty was overcome. When tested by a (364) Bunsen's photometer, the power of this burner was found to be four times that of the largest

oil lamp hitherto in use in the lighthouses of England or Ireland, while its cost for gas consumed was much less than that of the oil lamp. The Committee of the Irish Board of Lighthouses deputed to investigate the matter, consisting of the Earl of Meath, Sir James Dombrain, R.N., Mr. Thomas Bewley, Mr. Robert Callwell, and Mr. Henry Thomson, aided by the late Captain Roberts, R.N., determined that under these circumstances, they were bound to give the plan of lighting by gas instead of oil a fair trial, and consequently, with the consent of the Trinity House and the Board of Trade, they directed a gas apparatus to be erected at the Howth Bailey Lighthouse, the chief light of Dublin Bay. The light was erected there in October, 1865, and up to the present time has continued without intermission. The gas burned was made for a short time from oil, then from shale, and latterly from rich cannel, as more convenient, and giving gas of sufficiently good quality. The result as to the increased illuminating power of the new light appears to have been amply vouched for, by the unanimous testimony of captains of the numerous steamers connected with the Port of Dublin, and other persons qualified to judge, while the saving of expense to the lighthouse department, according to returns made to the Board of Trade, by the late Captain Roberts, R.N., has been shown to be about £50 per annum, including all materials and additional labour.*

Another light on the same principle has also been erected at Wicklow Head Lighthouse, with similarly satisfactory results. In the case of Wicklow, the light is intermittent, and the superior economy of gas is still more apparent than in a fixed light, for the oil lamp must burn at its full flame, whether the light is eclipsed or not, while the eclipses of the gas flame are caused by the extinction, and consequent saving of the gas itself.

The gas for the Wicklow Head Lighthouse has always been made from rich Scotch cannel coal, that at Howth Bailey was for a short time only made from oil, and afterwards from the same material as that used at Wicklow Head. Mr. Wigham has since invented an improved burner, by which such very important results were realized, that the eminent Professor Tyndall, of the Royal Institution, was sent by the Board of Trade, to investigate the whole subject; the following are extracts from his report:—

"The gas burner devised and constructed by Mr. Wigham consists of a series of concentric fish-tail jets. The three central rings

* See papers published by the Board of Trade by command of Her Majesty, on the subject of substituting gas for oil as an illuminating power in Lighthouses.

embrace a group of 28 jets, and this is the light employed under ordinary circumstances at Howth Bailey. To this central group can be added in succession four other circles of burners, each embracing 20 jets. Thus the lowest light employed is emitted by 28 jets, the next in power by 48, the next by 68, the next by 88, and the next by 108 jets of gas. It is possible, therefore, to employ lights of five different powers.

"The following tabular statement exhibits the results. In all cases the four-wick oil lamp is taken as the unit, and the illuminating power of the gas flame is expressed in terms of that unit.

"Four-wick lamps		Gas flame		Number of Jets.
1	..	$2\frac{1}{3}$	..	28
1	..	$4\frac{1}{4}$	..	48
1	..	$7\frac{1}{4}$	..	68
1	..	$9\frac{3}{4}$	..	88
1	..	13	..	108

"The superiority of the gas over the oil flame is rendered very conspicuous by these experiments. The 28 jet burner possesses $2\frac{1}{3}$ times, the 48 jet burner $4\frac{1}{4}$ times, the 68 jet burner $7\frac{1}{4}$ times, the 88 jet burner $9\frac{3}{4}$ times, and the 108 jet burner 13 times, the illuminating power of the four-wick flame.

"Besides the advantage of greater cheapness, the great increase of illuminating power which the employment of gas places at the disposal of the keeper on foggy nights, is a consideration of the very highest importance. This power is not drawn upon until it is needed, and it is then evoked in a moment of time.

"The observations and remarks regarding the Howth Bailey light have been permitted to follow each other without interruption, I however snatched a day, the 8th of June, from them to visit the lighthouse at Wicklow Head. The light here is also produced from gas. It is an intermittent light, being rendered so by a machine which cuts off at intervals the main supply, leaving open a byeway which is barely sufficient to keep the tips of the flames alight. The apparatus when wound up is self-acting, and it appears to do its work admirably. The intervals of darkness are of three seconds, during which there is no waste of light, and the luminous intervals of ten seconds duration. The light is cut off with exceeding promptness, the dark intervals being sharply separated from the light ones.

"Throughout the observations, both at Howth Bailey and at Wicklow Head, I was much struck with the perfect mastery of the keepers over the apparatus entrusted to them."

A new gas flashing light of still greater power than anything yet introduced is at this present moment under investigation by Captain Hawes, R.N., Inspector of Irish Lights. Many experiments have been made with it by this gentleman; Mr. Wigham and Doctor Tyndall have also witnessed it. When further observations of this new system have been made, we shall not fail to make the result public through the medium of this journal, but meanwhile it may be briefly described as a means of combining the enormous power of transmitting light of the great annular lens with the intense light of the gas flame; and superadding the economy obtainable by saving one-half of the light of the gas by its periodic extinction.

JAMES KENNEDY.

A Tale of the War Time.

By JAMES B. KENNEDY, Lieutenant, R.N.R.
Edited by D. J. M.

Conclusion.

How many there are, who having successfully climbed the ladder of life, cease to remember by what means they got there, so elated are they at having reached the summit, that they complacently sit on the top rung and forget all beneath them, and ascribe the position they have attained to their own exertions and their own virtues! Still there are some—we will hope many—exceptions to this; men who are not ashamed to look down and balance the chances in their minds as to where they would have been, and what would have become of them if this or that rung had failed them in their ascent. In the first case, if the ladder is a naval one, the first may be considered that by which he climbed a ship's side into the Navy; later on, the forbearance of a lieutenant (perhaps still a lieutenant) that prevented his dismissal from the service for some act of youthful folly or breach of discipline—that was a good rung. The death of a shipmate that accelerated promotion and appointed him to a ship where he was first enabled to distinguish himself; what a wonderful and important rung was that. The circumstance of his life being saved by a seaman catching him as his foot slipped or he would have fallen from aloft; where would he have been but for that rung? The exchange he effected to another ship when the ship he left and his old friends and messmates were never heard of again

—is that a rung to forget? The shot, the fever, that took his friend and companion might have taken him! Oh! it is sickening to hear some, who in rank and position have succeeded far beyond their merits or deserts, say, "By jove, sir! if I had only done this or that I should have been a great deal better off than I am, or, if I had not joined the service I should have been ——."

But I am not about to preach a sermon, my intention was only to tell you (the reader) that I had not forgotten one little rung in my own small editorial ladder, namely, that by which I became possessed of the little story or rather biography concluded in the last chapter. I *might* say, "Well, sir, if I had not got that, ten to one I should have written you a much better one myself," but I say no such thing—I could not have done it; and I am, if you are not—very grateful to the author for it. But think you I should ever have heard of Mr. Kennedy or of his noble father, had it not been for the old Greenwich pensioner and for the accident by which I put his property into my pocket? that helped me up that step of the ladder, and as I went on with my very light duty of editing—always forgetting the day of the month until a sharp note from Mr. Editor (the real Simon Pure) requesting "copy at once" reminded me that he wanted to "go to press," and I was obliged to send off an instalment of the story—I did not forget James Cassidy.

In the month of May of this year of our Lord 1871, when I had actually sent off Chapters V. and VI. without being worried, it came into my mind that I would endeavour to seek out my old friend of one hour, and as I thought it would please him to know something of the result of our accidental meeting, I packed my papers into my pocket and set off on a voyage of discovery, a polar voyage if you will, with old Cassidy for the pole. I knew the direction, East Greenwich, but the channels were not well defined —a pensioner—old—white hair—haunts the hospital—with a granddaughter—his name James Cassidy—quite sufficient for a detective, but I do not belong to the force. Greenwich was reached and I went straight to the Police, not that I supposed my old friend was known to them in their official capacity, but the Police at the Hospital gates being stationary, must doubtless have noticed him going in and out; so I went to the gate, and a Policeman who was doing watch and ward—and who certainly did credit to his treatment by the rotundity of his form (I suppose like the Hospital he guarded, he had nothing to do), answered my enquiry. There were a good many old hands about—they hang on to the premises—thought he remembered the old man I wanted—did'nt know his name—if I enquired at the Publics they might know—the best locality to make

enquiry was between the Trafalgar Road and the River—none of them old coves go far from the river side—that's Trafalgar Road it goes straight to Woolwich—Good morning, sir.

I did not exactly follow the policeman's advice, for although James Cassidy had a nubbly face it did not betoken a man addicted to drink, so I did not beat up for information at the "Publics," but striding down to the River I methodically worked the streets that led away from it. There are curious places enough along the River side of any populous place, but the queer ins and outs of East Greenwich exceeded my belief: at one time in turning inland I found myself in a *cul de sac*, from which I had to retrace my steps; at another I could find no outlet, but seeing a person emerge from under a house found an opening that way; boat yards, anchor yards, old iron yards, coal yards in every direction, and there stands the quaint old

HOSPITALÆ
SANCTÆ ET INDIVIDVÆ TRINITATIS,
GRENWICI,
1616,

looking so clean amidst all the surrounding grime. In some streets I scarcely asked a question, for I said to myself, "I am sure James Cassidy would not bring that fair bright-eyed creature here;" in other and more likely localities I enquired at the bakers' shops, for I knew he must eat bread; and as he had displayed a tobacco pouch to my sight I knew that he smoked, so I appealed also to the tobacconists; but for a long time my search was vain, many a wrong errand was I sent on; at length in a little chandler's shop, to enter which I had to descend two steps and stoop my head, I got hold of the true scent. A clean looking old lady with grey hair and close cap, knew Mr. Cassidy, he bought his baccy and groceries there, she had not seen him for a long time—often saw his little granddaughter, didn't exactly know where he lived, but believed it was near the Anchor Wharf, towards the River—but she would send her little grandson to show me where it was, and she called "Bill" to show the gentleman the way. After making a purchase of a few very doubtful and very dry cigars, Bill and I started on our mission: the boy was very glum at first, I think he was called away from his tea, for his mouth was full when he emerged from the little back parlour into the shop, but we had not got far before the sight of a new shilling, and the promise that it should be his if he discovered the residence of the person I was in search of, soon worked a wonderful change in him, and every now and then he would dart off when he saw a boy he knew, to

make enquiry, and at last he was successful, for he came back with a broad grin on his countenance and told me that Mr. Cassidy lived in Nile Row, and then set off at such a pace that he had to wait at the corners until I overtook him. At length we came to a row of neat looking houses with miniature gardens fenced from the street by dwarf railings. On enquiring at the first house we found that Mr. Cassidy lived in the other end house, and the boy was off like lightning and had knocked at the door and the door was opened before I got to the gate. "Here you are, sir! this is Mrs. Cassidy, sir!" At first I thought I was wrong again, for the comely-looking woman that made her appearance could not be old Cassidy's wife.

"I beg your pardon," said I, as I went through the little gate to the door, "I am afraid I have made a mistake; I was enquiring for one James Cassidy, a rather (I felt I was on rather tender ground) elderly gentleman who was a pensioner"—"And is still, and that's me," said the old man's voice from within; so the boy got the bright shilling and with a brighter face went off. "Will you please to come in, sir," said Mrs. Cassidy, "my father—" "Oh! your father," said I—"yes, sir, at least he's my father-in-law," said the woman blushing, "he can't come out or he would," so I entered the narrow passage, and turning in at a door to the left, found the old man I was in search of, sitting in a Windsor arm chair with his leg up on another. "Y'r sarvint, sir," said he, "I'm moored here with the rhumatiz, so I hopes you'll 'scuse my not gettin up." "I suppose you do not remember me, Mr. Cassidy," said I. The old man looked earnestly at me and shaded his eyes with his hand as he answered, "I can't say as I do, sir, but please sit down, and then you can jog my stoopid old mem'ry, sir." I sat down and taking out my purse was about to open it, when the old man put his hand upon my arm and said, "Thankee, sir, all the same, but thank God and the blessed Queen I'm not"—I interrupted him and said, "My dear sir, I was not about to insult you, I wished to take a card out by means of which I wished to jog the old memory you speak so depreciatingly of," and I took out the card I had so unceremoniously deprived him of and handed it to him, "I can't read ritin, sir, altho' I can do a little in the spellin' now; Mary my dear, give me my bring-em-tos,—I calls my glasses bring-em-tos, sir, for though I see well enough at a distance I can't see things close to." After wiping a pair of large silver-rimmed spectacles he put them on and holding the card well out, he recognised it at once. "Well, sir," said he, "I have missed that 'ere card for a long time and could not tell where I put it to; may I be so bold as to ax you where you found it?" I then told him about our former meeting

and how I unintentionally pocketed it. "I remembers it all now, sir, and well I has cause to remember it, for I aint a been as far as the old place since that day, and scarcely out of the house, the rhumatiz seized me in the knee and hove me on my beam ends, but here comes my pritty one, you remembers her, I s'pose, sir?" and in bounced my fair blue-eyed friend with bag in hand, just returned from school. Directly she saw a stranger present she became subdued, and dropping her eyes curtsied, and passing behind my chair went up to her old grandfather and kissing him gently on his forehead, took off her bonnet, and standing by his chair put her arm round his neck and again took possession of the old man as if he had been her especial property, and she were prepared to defend him against all comers.

"You remember that gentleman, Flo, my dear, don't you?" the blue eyes were raised to mine, and without uttering a word she went to a small chest of drawers on the top of which some books were neatly arranged, and taking one, she brought it directly to me, and opening it at the fly leaf, placed it on the table and resumed her place by the side of her grandfather and looked with a timid smile at me. I took up the book, which was one of Cumming's Bible Stories, and in a good round hand between lines was written "Florence Mary Cassidy, from ———, 5th Sept., 1870." "So you expected to see me again, Florence, did you?" said I, "you have made a good choice, and if you will give me a pen I will make the omission good," she jumped and brought me a pen and ink, and I wrote D. J. M——. "Thank you, sir, and thank you for the nice book, for Tom and I have read it all through." "And who may Tom be?" said I. "My little brother," she replied, "he will be here presently as it is nearly five o'clock." "I hope, sir," said the old man, "you will not think me too bold, but we pipes to supper reg'lar at two bells, and if so be you will take a pannikin o' tea with us you shall be very welcome." "Why don't you say cup of tea, grandfather," said Flo. "Why, my pritty one," rejoined the old man, "because the gen'leman understands me better when I says 'pannikin,' because it's the nat'ral thing to drink tea out of." I accepted the old man's invite, and I told him I had come from London to see him, and wanted to have a chat with him. "Com'd from London to see me!" said the old man, "then the gen'leman *will* take tea with us, put in an extra 'lowance for one, enough for two, and you, Flo, go round to old Harris and bring a pint of his best shrimps, and tell him if they ain't fresh I'll skin him instead of the shrimps." It was of no use my protesting that no difference should be made for me, the old gentleman told me that although he was only a quarter-

master, he was "captain of his own ship;" and as Flo had flown but stopped at the door by her mother I gave up the point, and I could hear Mrs. Cassidy putting an extra polish on for the visitor.

Looking round the room, I remarked that he seemed to be comfortably settled. "Yes, sir, thank God and our blessed Queen," raising his hand to where his hat would have been had he been out of doors, "yes, sir, I have a great deal to be thankful for, and we has a great many conweniences here. You see, sir, I finds it a hard matter to get up steps with this here knee o' mine, so I has that room for my bedroom, and Tom sleeps in a bunk in the corner; then Mary and Flo has the front room up stairs over this, and we lets the back up-stairs to a wery 'spectable man, employed at the Telegraph works: then, sir, for adwantages, if you stand back there and look through the starboard upper pane you can see the wane of the College, so I can alwers see how the wind blows; then at the back—open that door, sir—you see we has a row of houses, and that is the end one; it isn't in the way as it keeps off the east wind, which is werry cold here, and if there was one more it *would* be in the way, as I could'nt then get that beautiful peep o' the river with the craft going up and down, for although laid up in ord'nary, I ar'nt lost all my nat'ral feelin's for the sea." Where he would have stopped in his commendations I know not, but the entry of Mrs. Cassidy, with a tray of homely but very clean cups and saucers, stopped him, and he critically eyed all she did with "put that plate there—butter here, Mary, my dear." "I likes to see things ship shape and Bristol fashion," said the old man to me, and as Mary went out of the room he whispered, "My poor son, who was lost in the *Orpheus*, made a good choice there," motioning to the door, "she's been a mother to me, sir,—and as to Flo, there ar'nt another like her nowhere, she's meat and drink, and more to me; oh, how good God has been to an old sinner like me, to give me such a pair. Tom isn't like 'em, but then he's a boy, sir, and will be all the better when he's been rubbed down at sea a little."

Flo, with a boy, now passed the window and came in. "Tom," called the old man, "don't bring yourself to an anchor 'till you've been scrubbed down, and see that you're fit to pass muster before you come in." "Yes, grandfather," was the answer, and soon I heard a blowing and puffing, which I readily understood to be Tom performing his ablutions. In the mean time Mary and her daughter set the table in order and we had tea. Tea and shrimps and Greenwich, are synonymous, but if the former is always like what was set before me at that little round table in the

old pensioner's house, I could only wish that any place I belonged to had the same associations. It might have been because I had not dined, but I thought the bread, butter, and shrimps simply delicious, and the old man seemed quite pleased at the justice I did to them. Tom made his appearance soon after we commenced, with a very bright rosy face, and a grin on it, and hair wet and combed. "Come round here, sir," said the old man, "and tow a line; hold out your hands, now turn round, and now you may go and say, How d'ye do to the gentleman." Tom seemed to enjoy his thick hunches of bread and butter as much as I did my more modest slices which Mary kept me well supplied with. After Flo had very modestly said grace, the old man said, "Now, Mary, my dear, clear decks," which with Flo to help her, was soon done, and Flo was soon by her grandfather's side, while her mother sat by the window with some work, and Tom sitting on a low stool amused himself by staring at me.

"I will now tell you, Mr. Cassidy, what I came to see you about," said I, taking out the roll of papers from my pocket. It evidently puzzled them as the old man raised his shaggy eyebrows, and Mary ceased to stitch and looked at me. I then read a part of my introductory chapter, and when I came to my conversation with the old man in the hospital, his astonishment reached its climax. "Why, that's me, sir, only to think of me being in print!" "Now—I—has—it," said the old man very slowly, "now I sees it all, why, sir, would you believe it, I have had four gentlemen here since the early spring axin if I was James Cassidy, and when I said no, they axed me if I know'd him—now—I sees it." I explained to him that I was obliged to alter his name a little to save him from the impertinences of curiosity-mongers, and even after that precaution I was afraid I had been too specific to shield him. I went on reading and came to where Flo interrupted our conversation. "Why, that's me," said Flo, timidly, her colour rising to her cheeks, and her mild blue eyes lighting up. "Yes, my dear, that is you," said I; there was no more stitching, all were in mute attention, and I read such part of Mr. Kennedy's biography as I thought would interest the old man, and it evidently did, as exclamations escaped him occasionally, "Well done, sir, well done! (apostrophising his old master) Bravo! that's like him! I know'd he'd do it! That's capital!" And when I came to the *Blake's* commission his eyes lighted up, and he exclaimed, "I 'members it well! Ah, that was a bad affair (the Walcheren)! Yes he did, sir!" and so on, until I had finished the narrative. "Didn't I tell you, sir, that my master was a learned man, how well he done it; why, sir, it seems as if it

all happened yesterday, I has it all before my eyes; thank'ee, sir, thank'ee much for taking the trouble to come so far to please an old tar, we's all s'treemly grateful, sir, arn't we?" said he, looking round. "Yes, sir," said Mary, "anything that gives father pleasure I can't thank you too much for." "Yes," whispered Flo, and "Oh, it was jolly, and no mistake," said Master Tom, with a broad grin and rubbing his hands.

"Ah, sir," said the old man, "I have only one wish more, and that is, that my poor boy could have been here to a heard ye, he as was lost in the *Orpheus*, he was a sailor every inch on 'im, you see that brig, sir," pointing to a pretty little model on a shelf, "he made that and rigg'd it hisself, there arn't a rope yarn out of order, every dead eye turned in reg'lar, with the proper number o' turns in ev'ry seizin, and the stays moused and all: ah, if Tom had been here—but its no use wishin', sir, he's better off;" there was a pause, a deep sob from the window, while poor Flo had to do double duty this time in wiping the old man's eyes and her own, even master Tom was subdued and hung his head.

"I axes y'r pardon," at last said the old man, "but then, sir, he was my only boy." I begged him not to offer any excuse for such natural feelings, and by way of diverting his thoughts, asked him what the government had done for him when he left the hospital. "They was very lib'ral, sir, for my services, sir, most of which was as petty officer, they gived me £47 2s. 9d. a year, and that with what Mary gets by her work, and what the lodger brings in, we gets on very comfor'ble, but I don't know what they'll do when the old man's gone." I replied, that I hoped that he would be spared to them many years, and then, that as it was getting quite dusk, I must say good bye. The old man got on his legs, but was obliged to sit down again. "Confound these old legs of mine, they has the master o' me, and I must give in." I shook the old man's hand, "Good bye, sir," said he, "I hopes you will come and see the old man again, and if you sees my old master's son agin, please give my best respects to him." I promised him I would, and saying good bye to Mary and Flo (I did kiss her this time), I told Master Tom to put on his cap, and pilot me to Trafalgar road, which he did, and on receiving his pilotage dues, went off in such delight that he forgot to say good bye.

I could not help thinking on my way to town, what a comparative thing happiness is, how we mortals strive and strain and crush each other under foot, and heap up wealth, and rank, and titles, always saying within, that a little, only a little more, and we shall be happy, but the happiness never comes; and here is this crippled old man

with his little family circle, living in by no means a select spot, content,—turning every little circumstance of his position to account, as something to be grateful for, and, if there is happiness on earth—happy, and all on a yearly sum that a butler would indignantly decline. As I laid my head on my pillow that night, I believe I felt more gratitude and more content with my position in life than I had done for many a day.

At the risk of tiring the patience of my readers, I must take one more trip to Greenwich, which was only two months after the visit recorded above and while the last chapters of the biography were in the press. On reaching Cassidy's house Mrs. Cassidy responded to my knock, and on seeing me said, "Oh, sir, we are in sad trouble; father is so ill." "I am truly sorry to hear that," said I; "what is the matter with him?" "He was seized with paralysis all down the left side;" and, in the little parlour, she told me that three weeks since he had been seized and had not risen from his bed since. "But, sir," said she, "he is so happy and comfortable, and so cheerful, I can't make him out. When I married his son he used to be uppish and cantankerous sometimes, but every affliction that has come on him he seems to think less of it, and now that he can't move hand or foot he seems better than ever." "Can I see him?" said I. "Oh yes, sir," she replied, "if he is not asleep. Flo is always with him; she reads to him, and he calls her his guardian angel." She opened the door gently, and the voice of Flo said, "He's not asleep, mother." "Here's some one come to see you, father." The old man was lying with his back to me, with his bare arm outside the counterpane, for the weather was very hot and close. I could see his shrunken arm tattooed all over with anchors, initials, and, above the elbow, the simple couplet—

"From rocks and shoals and every ill
May God protect the sailor still."

Flo was sitting on a chair by his side, and by her eyes acknowledged me. "Is that you, doctor?" said the old man; "you see I've not slipped my cable yet, but I've got a spring on and am all ready." "I grieve to see you here, my old friend," said I, taking his hand in mine. Turning his head a little he recognised me, and said, "It's very good of you to come and see the old man, sir, before he trips anchor for his last voyage; I'm sure I'm very much obliged to you." "Don't mention it," I replied; "had I known you were ill I would have been down before." "Thank'ee, sir," said he, "you're very kind." "I hope Flo makes a good nurse, Cassidy." "She does indeed, sir," said Cassidy; "I don't know what I should do without my pretty one; she's my gardin angel

now. You see, sir, Mary has plenty to do, and Flo is shipped as my tender and keeps me supplied, and takes care not to let me off taking my medicine,—don't you, Flo? And then she reads to me and sings to me, so that I am as jolly as a lark." "I am glad to see you so cheerful, Cassidy," said I. "Cheerful, sir! why look at the mercies I has round me, and say how could I be t'otherwise; 'stead of being left to die in a ditch, as many a better man has before me, here I've got all I could wish,"—and then, with a little falter of the voice, he added, "Nearly—all I could wish; my poor Tom! but we'll soon be shipmates again, sir, and for a good long commission,—he's only gone before to secure a good berth for his old father." "I am sure, Cassidy, you must have good grounds for the comfortable assurance you have for the future." "Yes, I have, sir, and I'll tell you when I got it; and it may seem strange to you, sir, when I tells you it was when I got out of myself." "I don't quite understand you, my good friend," said I. "Why, sir, when I was a young man and had to go aloft, I trusted in these arms and these legs to take me there, and felt secure; now I am about to be ordered aloft agin, these arms and these legs won't take me there; I've no trust in them, sir, or myself either, so I have to trust another, and He has strength and power to carry out His part in the engagement I signed articles for. I've sarved my time and am ready, and but for these," looking round at Mary and Flo, "the sooner I goes the better." "Time enough, Cassidy," said I, cheerfully; "and now, tell me, is there anything I can do for you?" "Thank'ee kindly," said the old man, and his eyes glistened, "but," and he paused, "it's almost too much to ax of ye, sir." "Try me," said I, "I can but tell you it is out of my power." "Thank'ee, sir, thank'ee." "Mary, my dear, will you take Flo away for a minit or two." Flo stooped over the old man and kissed him gently on the forehead, and then as gently wiped his face, and then looking at me, as much as to say, "Take care of him," followed her mother out. "Will you sit down, sir,—thank'ee. You see, sir, I'm obliged to keep up for their sakes, but it isn't far off, I can tell that, although what Flo will do without me I don't know. However, sir, when you axed me if you could do anything for me, a sudden thought comed across me that maybe you could,—not for them, sir," motioning to the other room; "I've left a tidy bit in the savings' bank as will help them on, but that boy Tom is almost too much for 'em, and when I'm gone there'll be no one to keep him in order; in a short time he will be old enough to go into the college school, and if you could put Mary into the way of gettin' him there, I should have a clean bill of health for clearin'

out." I promised the old man I would make the necessary enquiries, and it should not be my fault if Tom did not get in. He squeezed my hand, and again said, "Thank'ee, sir, thank'ee," and as he looked tired I called in Mary and Flo, and took my leave of them all, promising to come down again very soon. I left my address, and told them to write if anything was wanted.

I was wanted, for that day week I received a nicely written note from Mary, telling me that her father-in-law had had a second attack, which he only survived a few hours, and that he had told her to tell me that he would be proud if I could come down and see him "safely stowed under hatches," and also telling me the day and hour and the place he was to be buried in.

Proud! Proud of *my* attendance! What a word! Yes, proud. Shall I own it? that *I* felt proud! proud at being thought worthy of standing by the grave of that good old man. At first I resolved to go down at once, but what right had I to intrude on the sacredness of that little circle?

A few days after I was beside the grave of my late old friend. I have often attended funerals, *performed*, surrounded by all the ridiculous trappings of undertakers' woe—feathers, velvet, staves, mutes—all at so much for the day, even to the very cloak that the sleek and lugubrious undertaker enveloped my person in. Pshaw! I felt I was only performing a part in a sacred comedy; but never did I feel the full force of that beautiful ceremonial as I did when all that remained of that old Greenwich pensioner was lowered into its narrow resting place, and real tears dropped fast on the coffin lid.

When all was over, a gentle squeeze of the hand from Mary and Flo told all their thanks, and as I slowly retired from the ground I found myself repeating, "an Israelite indeed in whom there was no guile."

I can only add that Mary and Flo may frequently be seen on a Sunday afternoon, walking up and down the extensive playground of the Hospital school, with a fat boy in a white frock, blue trowsers, and straw hat (the new and becoming dress of the institution); and Tom says he likes the school very much. We can only hope he will make as good a man as his grandfather, or be as successful in life as the sons of the worthy man whose name graces this tale of the war time,

JAMES KENNEDY.

THE GERMAN MARINE.

An intelligent and observant correspondent of the *Daily News* has recently communicated some most interesting particulars concerning the German maritime resources and prospects. This information will not, we fear, add much to the peace of mind of those who regard the German nation as the cuckoo in the European nest,—but it is not without its value in showing us how, with only a small seaboard, a vigorous and determined people can make the most of their limited natural maritime resources, and establish a powerful navy to protect a growing mercantile marine. We reprint the two letters from the *Daily News*, because we believe that those of our readers who have not seen them will now peruse them with much interest.

The first letter is on the subject of the New Harbour at Wilhelmshaven.

"Opening into the south-eastern corner of the North Sea, and in close proximity to each other, are three considerable estuaries—that of the Jade (the most westerly); that of the Weser; and that of the Elbe. The mouths of all and the coast generally are much obstructed by sandbanks, and the navigation is the reverse of easy. The war harbour of Wilhelmshaven is on the western side of the bay of Jade, near where the outer bay or channel joins the inner bay, which expands into a lake-like expanse of shallow water. At the spot chosen for the harbour there was naturally a blunt projection, with its point looking to the south-east, the whole coast being girdled by a substantial sea-wall, since it is considerably below high-water mark. The engineers entrusted with the construction of the war harbour took advantage of this projection. To obtain the requisite depth of water they cut the original sea-wall, and projected the bisected edges on either side a considerable distance into the bay. From the rounded terminations of the sea-wall on either side of the artificial channel, solid granite moles are still further projected seaward a distance of about 350 feet, terminating in substantial rounded buttresses. The general effect is that a sharp triangular projection has been thrust out seaward from the face of the original sea-wall, cut in two from apex to base by the artificial channel leading to the war harbour. This projection has been flanked on either side by a low stone dyke stretching along the face of the old sea-wall considerably to seaward, the intent being to reclaim the interval, and thus diminish the abruptness of the artificial projection. Between the two moleheads is the outer

entrance to the harbour—350 feet across. This porch, as it may be styled, is a parallelogram 700 feet long, and half as broad, flanked continuously by the solid granite moles, and bounded inwards by a lock, 132 feet long and 66 feet wide, shut in at either end by ponderous sluice gates. Inside this lock comes another basin, 600 feet long and 400 feet wide, called the 'fore-haven,' and it again at its inward end is bounded by a second lock of the same dimensions as that separating it from the 'porch.' This 'fore-haven' has its jetties in brick, trimmed at the corners and the copes with granite. From the second lock runs backward, with a slight bend into the inner haven, a long brick-faced canal, varying in width from 180 to 260 feet, and in length 3,600 feet, having a square recess on its right about halfway up, for the convenience of discharge of the dredging craft, which are constantly at work. The inner basin, or 'war harbour,' at the head of the canal, is 1,200 feet long, and 750 feet wide. From its right hand top corner there opens another small basin for boats and masts. The length of the haven is in the same line with the canal that leads to it. At the head of the haven are three dry docks, two capable of containing the largest iron-clads, the third smaller, and two slips for the construction of war vessels, both affording accommodation for the laying down of large iron-clads. Behind the dry docks and slips is a large workshop or machine shed, containing steam hammers, machinery for the rolling and cutting of armour-plates, as well as for forging iron ribs, knees, and other component parts of an iron war ship.

"All around the haven are to be shipyards, magazines, and store sheds, but for the most part not even the foundations of these are yet laid. The foundations are in course of excavation for a boiler shed, it being contemplated to construct on the premises the boilers, cylinders, etc., of the vessels which may be constructed in the new dockyard; but it is obvious that considerable time must elapse before Wilhelmshaven can in any such respect be 'self-contained' and independent. Behind the shipyard, at the head of the harbour, a house for a port admiral is approaching completion, as also are a detached building for his aides, and a row of houses for superior dockyard labourers. Nearer the sea are barracks for marine artillerymen, very nearly finished, and laboratories and other buildings connected with a war dockyard, all in a more or less unfinished condition. In the war haven the most prominent object is the *König Wilhelm*, the largest iron-clad in the German navy. No more succinct and accurate description of this fine war ship exists than that contained in the 'Statesman's Year Book for 1871,' as I have personally verified. The *König Wilhelm*, built at the

Thames Ironworks, Blackwall, and launched on the 25th of April, 1868, was designed by the Chief Constructor of the British Navy, is of 5,938 tons burden, with engines of 1,150 horse power, and carries in her broadside batteries 18 rifled 96-pounders, made of Krupp's hammered steel, and capable of being fired as often as twice in a minute. The length of the *König Wilhelm* is 365 feet, or 15 feet shorter than our *Warrior;* the breadth of the former is 60 feet against the *Warrior's* 58 feet. The armour is eight inches thick all round, diminishing to seven inches, at seven feet below the water line where it terminates. The bowsprit carries a sharp and ponderous ram projecting under water, and protected by strong plating. Aft of the bowsprit projection rises a strong topgallant forecastle, on the port and starboard sides of which, as well as on either quarter, slightly projecting outward from the run of the ship, are recesses or bays (four in all), protected by massive bulkheads, composed of eighteen inches of teak, plated with 6-inch armour, and built up from the lower deck through the main deck to a height of seven feet above the spar deck. In each recess is a 300-pounder rifled Krupp; the two in the forecastle bays looking direct forward, the two in the quarter bays having a rake almost, but not altogether, due aft. In the admiral's cabin in the stern is a steel 200-pounder, whose porthole opens due aft over the rudder. The *König Wilhelm's* complement of crew is 700 men, and the cost of the vessel, including armament, was about half a million sterling. At present she has only as many sailors on board as suffice to find a harbour watch, and is wholly stripped of running and standing rigging, nothing showing above the deck but the three lower masts. The *König Wilhelm* is the only ironclad at present in Wilhelmshaven of the five belonging to the German Imperial navy. Besides the leviathan, there is the *Arcona*, an old wooden frigate of 1,715 tons, 400 horse power, and 28 guns of no great size; and 12 gunboats, some of the first, some of the second class, the first of 80 horse power and mounting (when mounted) three guns, the latter of 60 horse power and carrying two guns each. A fast and handsome despatch boat, the *Falke*, is being fitted out for special service; the *Falke* has beautiful lines and can steam 16 knots an hour. She is lying alongside a large steam crane, the machine house of which is the only building as yet erected on the south side of the war haven.

"I have already mentioned that there are two building slips at the head of the harbour. The dry docks might be utilized as well for building purposes; but then they would not be available for their own uses. On one of the slips is the little *Loreley*, a beauiftully

modelled paddle-wheel aviso, intended for quick work in the neighbourhood of the harbour. She is all but ready for launching, and her launch is expected to take place next week. The *Loreley* cannot be called any addition to the German war navy. On the other slip stands the skeleton of the intended ironclad turret ship the *Grosser Kurfürst*. Judging by the appearance of the slip one would say the *Kurfürst* was little more than thought about, but a good deal of her, although not put together, is ready and stowed fragmentarily in the sheds behind. In the workshops the workmen are now rolling and experimentally putting together the keel, and the iron ribs are stacked all about as well as some of the armour plates. At the shortest, however, it will be three years before the *Kurfürst* is ready for launching, and in all probability it will be four years before the ship is afloat. She will be a turret ship of about 4,000 tons, having two turrets, and carrying in each turret two 11-inch guns, equivalent to our 600-pounders, taking a charge of 72 pounds of powder. As soon as the launch of the *Loreley* leaves the other slip clear it is intended to lay down upon it a second ironclad, which, in essential particulars will be a sister ship to the *Grosser Kurfürst*. Much, however, must be done before it is possible to prosecute with any alacrity the simultaneous construction of two ironclads in the Wilhelmshaven dockyard. At present one seems to strain the capacity of the place, judging by the length of time it has nominally been in course of construction as compared with the stage of progress which it has reached and the length of time it confessedly will take to finish it. It is true that during the war the progress of shipbuilding seems to have been altogether stayed, in common indeed with all the works at Wilhelmshaven, except those connected with the defence of the place. Since the strain of the necessity for defensive operations has ceased, and especially since the peace, the shipbuilding and other constructive works have been recommenced, but not with any great activity as yet. It is expected, however, that the construction of the *Kurfürst* will soon be pushed forward with considerable briskness, and the laying down of the other ironclad set about as soon as the *Loreley* is launched. At Kiel another ironclad, *Friedrich der Grosse*, is in an incipient condition of construction; and at Dantzic the ironclad *Hansa* (to carry eight guns, and of 450 horse power) is about half built, while another ironclad is being laid down. Another is being laid down at Stralsund, and thus it is calculated that within four years her own dockyards, exclusive of foreign purchases or commissions, will furnish Germany with six ironclad war ships. At present she has nominally five ironclads—The *König Wilhelm*, already

described; the *Prince Friedrich Carl*, French-built, after the model of *La Couronne and La Normandie* (not greatly esteemed in 1871), of 4,044 tons, mounting 16 guns, of 950 horse power, and with a crew of 500 men; the *Kronprinz*, Thames built, with 5-inch armour-plating, 14 steel breech-loading 7-ton, and two pivot guns, of 3,400 tons and 800 horse power; the *Arminius*, and the *Prince Adalbert*, of which nothing need be said further than that they carry respectively four and three guns, and that their armour-plating is from three to four inches thick."

In the second letter the Special Correspondent writes as follows respecting

THE GERMAN WAR NAVY.

"The Prussian war navy, handed over to the North German Confederation and now become the Imperial navy, owes its initiation to Prince Adalbert, who is now the admiral commanding it. In the early days it was officered partly by officers of other nationalities, and by suitable men taken from the merchant navy. A naval school for training young officers was, however, very soon instituted, and for a long time none have been admitted into the navy except through its portals. The following are the tests applied to a young officer to ensure his efficiency. The entry of a cadet is admissable between the ages of sixteen and seventeen; the applicant must come with a certificate that he has passed a gymnasium examination in the first class, and he has in addition to pass a stiff examination on the following subjects. Arithmetic, geometry, trigonometry, stereometry, spherical trigonometry, physics (comprehending optics, acoustics, heat, electricity, magnetism, electro magnetism, and induction), geography (physical and political), French and English languages, drawing; and when not educated in a gymnasium, history and Latin in addition. The aspirant then serves for one year in the cadet-ship, when he goes up for his examination for the rank of midshipman. The following are the subjects on which he has to satisfy by no means lenient inquisitors:—Navigation, elements of astronomical geography, logwork, etc. (technical and theoretical), taking solar, lunar, stellar, and planetic observations; construction and use of charts; practical acquaintance with the use and construction of the sextant, barometer, thermometer, sympiesometer, chronometer, the deviation of the compass, etc.; seamanship in all its details, practical and theoretical; examination in artillery; knowledge of powders—their composition, explosive force, burning speed, and projectile power; ability to judge between good and bad powder; methods of proving

powders; the stowage of powder in magazines, afloat and ashore; transport of powder; classification and nomenclature of projectiles; acquaintance with their proper charges; knowledge of guns, gun carriages, and armour-plating; knowledge of gunnery practice; with many other topics of a more technical and intricate kind. The lad then goes afloat on service for two or three years as midshipman, and then enters the Naval School at Kiel, where he studies for a year or a year and a half, at the end of which time he presents himself for his examination to pass from midshipman to lieutenant. This examination covers the same ground as the former, but it is much more testing. He is probed to the bottom in navigation and seamanship, including tactics. Among the artillery subjects he is questioned as to the parabola in the flight of round shot and shell, the effects of impact with given materials, penetrating power of different projectiles, the probabilities of objective points, the details of foreign artillery armaments, and the use and effects of small arms in naval actions. In naval engineering he must have a full knowledge of machinery, including principles of condensation, expansion, etc., and of shipbuilding in all its details. He must be up in land fortifications and the manœuvres of an infantry force on shore. He must have full acquaintance with the regulations affecting discipline, and have the penal code (which is the same as that in force among the German land troops) at his fingers' ends. He must be accomplished in topographical draughtsmanship and in the construction of plans for batteries, and the impromptu defence of places. In mathematics he has to demonstrate familiarity with the differential and integral calculi.

"Having thus shown himself to be an Admirable Crichton, he is then at liberty to wait for his vacancy as sub-lieutenant. When midshipman, he enjoys the daily pay of 1s. 6d. sterling on shore; afloat, 2s. or 2s. 6d. extra as table money. He must serve two years at least as sub-lieutenant before promotion to lieutenant, but the average is from three to five years' service prior to the occurrence of a vacancy. After an average service of about six years as lieutenant, he becomes captain-lieutenant. At present this grade is attained without any additional examination, but it is intended to create an institution to be called the 'Naval High School,' of a similar character with the War School, attendance at which for a certain time is to be compulsory before the attainment of the rank of captain-lieutenant. As captain-lieutenant the term of service may average about six years, the next grade being commander; the higher ranks are, as with us, captain and admiral, the attainment to which is wholly dependent on the occurrence of vacancies.

Promotion is, without exception, by seniority; it being assumed, and surely not without cause, that efficiency is secured in all by the rigorous examinations which have to be undergone. The naval service is, with the exception of the officers of the merchant service taken into it at the beginning, and still remaining, wholly an aristocratic one. It is the fashion to join it, and it is at once compulsory and the fashion to pass good examinations in it. It is an achievement, the secret of which the Germans seem alone of European nations to have mastered, how to make it the fashion with young noblemen to work, as he who worketh that he may live. On board a first-rate ship the following is the cadre of officers:—1st. Captain; 2nd. Commander; 3rd. Navigating-Lieutenant (who is always a captain-lieutenant, and is the senior officer next to the commander); 4th. Gunnery-Lieutenant (who is also senior officer of the watch), and two or three junior watch-officers (lieutenants), with the quantum of lieutenants. Under the navigating-lieutenant there is no sailing-master; the former is responsible for the sailing of the ship and is aided by the best midshipmen on board. Similarly the gunnery-lieutenant has no gunner under him, but is responsible for all artillery details himself. It is noticeable how, by the test of seniority, greater stress seems to be laid upon navigation than gunnery; on the same principle, probably, that in a cavalry regiment the horses are always objects of greater solicitude than the men. Every ship in the German service, even the smallest gunboat, is provided with detailed drawings and sections of every foreign war ship. Its weak points are specifically stated, and details given as to the spots to be aimed at with most likelihood of disabling the machinery. 'My word,' to quote the *naïve* remark of an officer with whom I happened to have conversation on this topic—'My word, I know the ships of your fleet better than your own young officers.' And I saw enough to make me certain that this was no empty boast. Every ship possesses accurate and detailed charts of the naval ports of the world; and the examination to which officers are subjected on this, as on other topics, ensures their acquaintance with them, so that pilots, the want of which was one of the piteous complaints of the French naval officers on the farcical northern cruise of their fleet, are capable in emergency of being dispensed with. 'L'Orient is a very difficult port to make; I would not like to try that without a pilot. Plymouth! there is not a lieutenant in the German navy who could not take a ship into Plymouth in the night time.'

"This was what a naval officer quietly told me with whom I happened to have a talk on maritime affairs in a Berlin restaurant,

and his testimony is confirmed from other sources. It seems plain Germany does not want for naval officers—her lack is of a fleet and of a seaboard. The solution of the fleet problem is simple, if costly; the consideration of the other matter involves questions into which I do not feel called upon to enter.

"One word about the seamen. They are drawn from the seafaring population in the same manner as the army is from the inland population, the term of service being for three years. There are four classes. The first class, from which the petty officers are found, comes from a naval school, the pupils of which enter as boys, and are taught seamanship in youth. The term of service of this class is twelve years, after which they are provided for in various capacities in the civil service of the Crown in the same way as long service non-commissioned officers of the army. The pay of the first-class seaman is about 1s. 4d. per day, in addition to food and clothing. It does not seem to be the custom to retain, while ships are not in commission, the services of any save these first-class men. At Wilhelmshaven there are only about 200 sailors, who live in barracks on shore, and are all first-class men, in every sense of the word. Some difficulty might be experienced in getting together efficient crews for a fleet at short warning. It is not sufficient to have good seamen, such as the merchant services would furnish; it would seem to a non-professional man that some experience in the handling of great guns would be advantageous. It is not easy to see how they can be obtained with a scratch crew; nor is it easy to see how, if indiscriminate and unconditional discharges are given when a ship is paid off, anything but a scratch crew can be got together on short notice, taking into consideration the long absences from home of so many seamen.

"Not the least interesting question affecting naval matters which the late war brought up was that of torpedoes. The opinion of those whose experience of them was largest is not favourable to the value of fixed torpedoes. It is impossible to be certain that they remain stationary. 'You never know where they are,' was the pithy remark made to me concerning those at the mouth of the Jade. Often they go adrift and get in a tangle in a single night, and they block the road for friends as well as foes. The best means for the application of torpedoes is judged to be by means of boats constructed specially as torpedo-boats, which in a single night can lay down a belt of torpedoes in a fleet's pathway, or a ring of them round a fleet, ensuring the minimum of getting-adrift possibility. But my informant's sententious summary was, 'Torpedoes will never supersede forts, ships, and big cannon, although they may help at a pinch.'"

YACHTING.

WITHOUT preface or introductory remark, we continue our narrative of the doings of the yachting world, resuming the thread with a cursory notice of two or three of the minor events which occurred in the last week in June. On the Tuesday in that week the Royal London Club had a most enjoyable day, as regarded weather, down the Thames, the excuse for the "blow out" being a match for cutters of the third class, for which there were half a dozen entries, and which was won by the *Ildegonda* (15 tons, Mr. E. Langtry), the *Dudu* (15 tons, Mr. Holloway) taking the second prize. Rear-Commodore Charlwood, in the unavoidable absence of Commodore Broadwood, had the control of the match. On the previous day the Temple Club held their first match, over a course from Charlton to off Gravesend, and back. The *Madge* (cutter, 6 tons, Mr. R. Stone), on time allowance, took the first prize; the *Ocean Pearl* (cutter, 14 tons, Mr. Lyne), the second prize; and the little *Ethel* (cutter, 4 tons, Mr. Thompson) third. It escaped us last month to notice the third match of the season of the Clyde Club, which came off at the mouth of the Holy Loch, off Hunter's Quay, on the last Saturday in June. The competition was for two prizes for yachts under 29 tons, and for fourth-class yachts. The first prize in the former contest was won by the *Leanda* (20 tons, Mr. James Reed), and the second prize by the *Phantom* (27 tons, Mr. D. W. Finlay); the prize in the fourth-class match was won by the *Fairy* (4 tons, Mr. Armstrong). On the same day, the Royal Ulster sailed a match—their fourth this season—for yachts not exceeding 10 tons, belonging to the members, and to be sailed by two amateurs. It was won by the only 10-ton yacht that started, the *Boreas*, belonging to Mr. T. Workman. The *Amba*, a cutter of 9 tons, took the steersman's locket. A handicap match between cutters and yawls, which was sailed under the auspices of the New Thames Club on the last Wednesday in June, proved just about as interesting as handicaps usually are—which is saying very little for it. Mr. Ashbury's most recent "venture," the *Esthonia*, a cutter of 15 tons, a description of which appeared in last month's number of this magazine, was included in the list of entries, but did not show. On the following day, however, she took part in the third-class cutter match of the club, but as she was two tons short of ballast, it was not to be expected that she should show to advantage. The *Ildegonda* won.

In the regatta of the Royal Mersey Club, which took place on the 28th and 29th of June, the *Livonia* was again unsuccessful. She came in first, but lost the match to the *Enid* on the time allowance. This does not look like winning the cup of the *America*. At this same regatta the *Foxhound* and the *Glance* were beaten by the *Alcyone*, on the first day; but on the second the Marquis of Ailsa's wonderful little cutter was again "well up with them," running second to the *Enid*, and beating the *Glance*, which took a third prize. On the second day, too, the *Livonia* was once more beaten. The cup for yachts of ten tons and under was won by the *Wonderful* (ten tons, Mr. F. Wall), the *Brenda* (ten tons, Mr. James Leitch), second. On the 30th of June there was a Channel match from the Mersey to Barrow-in-Furness, of which it is sufficient to say that it was a time race, the *Livonia* and *Oimara* having to allow the *Vanguard* fifteen minutes. It was a flying start, the three vessels we have named getting over the line at about 9.20. They finished thus: *Oimara*, 3 h. 13 min. 42 sec.; *Livonia*, 3 h. 24 min. 3 sec.; and *Vanguard*, 3 h. 29 min. 37 sec. At the Clyde regatta, which was held about this time, the *Foxhound* was again returned a winner.

On the 1st of July a Corinthian match was sailed at Helensburgh for a piece of plate, presented by Mr. D. Finlay, Rear-Commodore of the Clyde Club; and on the same day a similar gift from Mr. Stevens produced a second race. The entries were limited to third and fourth class yachts. No paid hands allowed. The winner of the first match was the *Vision* (cutter, nine tons, Mr. Carsewell), which was cleverly handled by her amateur crew. Owing to an accident to the *Leander* (a fine cutter of twenty tons, belonging to Mr. J. Reid, and pronounced "the largest boat of her tonnage ever built"), Mr. Finlay's *Phantom* (twenty-seven tons) came in winner. While in this part of the United Kingdom, we must not omit noticing a remarkable match from Barrow-in-Furness, which took place on the 3rd. There were four entries, namely, the *Livonia*, *Enid*, *Glance*, and *Coralie*. A start was made at 11.45, with the breeze blowing briskly from W.S.W., and the four vessels passed the marked boat at Hunter's Quay as follows: *Enid*, 3 h. 45 min. 55 sec.; *Glance*, 3 h. 46 min.; *Livonia*, 3 h. 46 min. 25 sec.; and *Coralie*, 3 h. 54 min. The *Glance* took the prize on the time allowance; but note how closely the four vessels finished, and remember that "the run" was something like 180 miles.

Two dirty days in July were the 6th and 7th, as those hardy yachtsmen who were present at the regatta of the Royal Northern Club doubtless remember. Nevertheless, they were yachting days

of a stern, trying kind, such as men of genuine pluck rejoice in. There were five entries and four starters for the principal match on the first day. To secure the £100 for "cutters and yawls of royal yacht clubs, exceeding 40 tons," or if not that, the £80 for second, the *Oimara*, *Garrion*, *Vanguard*, and *Enid* appeared on the station at Largs, to sail a course round a flag-boat off Wemyss Bay, the Toward Buoy, a flag-boat off Mount Stewart, and back to Commodore; twice round, and once round Toward Buoy. It was a splendidly contested race, scarcely marred by the few disasters which befel one or other of the vessels, and which, indeed, only added a zest to the struggle—so far as the spectators were concerned, at any rate—and was remarkable chiefly for the admirable manner in which the winner was handled. The four started at 12.10, and in making the last turn of the distance buoy the three that finished were timed thus: *Garrion* (99 tons, Mr. F. Houldsworth), 5 h. 47 m. 40 s.; *Oimara* (162 tons, Mr. J. Wylie), 5 h. 48 m. 21 s.; and *Vanguard* (60 tons, Mr. W. Turner), 5 h. 54 m. 23 s. The two Scotch cutters finished first and second, but on the time allowance the south-country yacht, the *Vanguard*, took the principal prize, and the *Garrion* the second. Mr. Ashbury had entered the *Livonia* for the first-class schooner match, but as she had not arrived from Gourock at the hour of starting (12.40), of course she did not compete. Mr. Mulholland's fine schooner, the *Egeria*, won the prize. The £40, for second-class yachts of any rig, went to the *Xema* (cutter, 30 tons, Mr. Crawford), she taking it from the *Alcyone*, which came in first, on the time allowance. It was a matter of universal regret that the Marquis of Ailsa's flying *Foxhound* was not amongst the competitors in this match. The match for third-class yachts was won by the *Calypso* (cutter, 20 tons, Mr. Bremner), and that for yachts in the fourth-class by the *Brenda* (cutter, 9 tons, Mr. Leitch). Friday was a nasty day for the sightseers, and anything but pleasant for drawing-room yachtsmen—and such, we are credibly assured, there be; but there was no lack of wind. Only the *Vanguard* and *Garrion* competed in the match for first-class cutters, and as the former was disabled, she was unable to do more than make a gallant stern chase of it; the *Garrion* therefore took the prize. The race for schooners, the second match in the programme, was not sailed, the owner of the *Aglaia* protesting against being matched with the *Persis*. The Channel match for the Ailsa plate, for yachts of any rig, of any recognised club, exceeding 20 tons and not exceeding 40 tons, was won by the *Alcyone* (cutter, 39 tons, Sir W. Topham), beating *Maria*, *Xema*, and *Dinorah*. The *Lizzie* (cutter, 20 tons, Mr.

Coddington) won the third-class match; and the *Brenda* the prize for yachts under 10 tons. Such is a bare summary of the results of the Royal Northern Yacht Club regatta.

A remarkable decision, given by the Sailing Committee there, in respect of a protest entered by Mr. Turner, the owner of the *Vanguard*, we here take the opportunity of noticing,—let him state his own case. "On Friday, the 7th instant, the cutters *Garrion* and *Vanguard* sailed for the cup given by the Royal Northern Yacht Club. During the race the *Garrion* deliberately attempted to put the *Vanguard* about, the *Garrion* being on the port, and the *Vanguard* on the starboard tacks; so near was it being a collision, that, although the *Vanguard* was kept hard away, the *Garrion* had to luff up until all her canvas was shaking. Upon coming in, the committee stated that they could not entertain the protest as there had been no foul." To show the absurdity of this decision, Mr. Turner quotes the eighteenth rule of the R.N.Y.C. sailing directions, which runs thus:—"Vessels on the port tack must invariably give way to those on the starboard tack, and in all cases where a doubt exists of the possibility of the vessel on the port tack weathering the one on the starboard tack, the vessel on the port tack shall give way; or if the other vessel keeps her course and runs into her, the owner of the vessel on the port tack shall be liable to pay all damages that may occur, and forfeit all claim to the prize. Yachts going free must invariably give way to those by the wind on either tack." There is no mention of a foul here. Mr. Turner is too experienced a yachtsman to make frivolous objections,—indeed, that the objection was aught but frivolous was obvious to the spectators. There could only have been one cause for declining to entertain and investigate the objection. Perhaps the reader will be able to guess our meaning.

The Channel Match of the Prince of Wales Club took place on the 8th. It was a handicap affair, and was won by Mr. Lambert's *Fairlie*, 15 tons. The same vessel won the prize given at the Ipswich Regatta, on the 10th, for yachts not exceeding 16 tons. On the same day a regatta came off at Burgh, near Great Yarmouth, when the match for yachts under 12 tons, over the usual twelve-mile course, was won by the *Halcyon* (8 tons, Mr. Preston), on a time allowance. A channel race from Bangor to Kingstown, under the auspices of the Royal Alfred and Royal Ulster Yacht Clubs, came off on the 11th, and was a decided success. A schooner, a yawl, and ten cutters were entered, the list including some of the best yachts of the Irish fleet, and after an interesting contest, the race ended on the morning of the 12th in favour of the *Kilmeny*

(cutter, 30 tons, Mr. P. S. French), which, finishing third to the *Persis* and *Enid*, took the prize on a time allowance.

The following letter, which we copy from the *Field* of the 1st instant, will speak for itself:—

SIR,—I beg to call the attention of my brother yachtsmen to the high harbour dues levied upon yachts in the port of Ramsgate, in the hope that the matter may be brought to the notice of the Board of Trade, under whose immediate jurisdiction it is.

At Ramsgate yachts are charged 6d. per ton, while in Dover the amount is only 1½d. per ton. The present charges must prevent many yachts from going to Ramsgate, and I venture to hope that the matter may be represented to the proper authorities.

A YACHTSMAN.

It seems to us that a better system of nomenclature is required by yachtsmen. Their poverty of invention is past praying for. Mr. W. E. Lewin, it is gravely announced, "has renamed his yacht *Rambler*, the *Fairy*, after her winning the Boston Yacht Club Match." The connection between such a victory and such a name we fail to see. It must be marvellously subtle. And, we would ask, is the *Fairy* (late *Rambler*) the only yacht of that name? Surely not.

A yacht club has been formed at Greenhithe, under the name of the Junior Thames Yacht Club. The first match is fixed for the 26th of the present month (July), too late for us to notice it in this issue of the *Nautical*.

From Greenhithe to Constantinople is something of a step, but we take it to congratulate our countrymen at the Golden Horn on their yachting prospects.

A recent number of the *Levant Herald* contains the following interesting announcement:—"Not a few of our local readers will be glad to learn that a serious effort is at last being made to establish a Constantinople Yacht Club—this time free of the trammels and restrictions of any 'patronage' except that of the members themselves. It is intended that the new club shall be formed on the model of those which have done so much to promote the love of aquatic sports in England and America, with such excellent effects on the practical seamanship of both countries. Neither the Solent nor New York Bay can compare with the Marmora as a yachting ground, and where nature has done so much, it will be little creditable to Constantinople if there be not within it sporting energy enough to found at least the nucleus of a yacht squadron in some way worthy of these waters."

The champion crew have left Newcastle for America to once more fight it out for the championship of the world with the Canadians, whom they defeated last year. It will have been observed, that we have abandoned our recurrent notices of what may be called prize-boating. Notwithstanding, that such is the case, we step on one side for a moment to notice the new boat which the Newcastle crew have had built for them by Jewitt. The local journal, "for obvious reasons," abstains from publishing the dimensions of the boat, but describes her thus:—"The *Queen Victoria* is about half an inch nearer the water than the *England*, and is a shorter boat, and perhaps the merest trifle more rounded up. Narrow washboards are fitted round her combing, and she may be considered as the smooth-water boat of the pair which the crew take out with them. The skin is cedar, with white-wood fittings, and the steering apparatus is worked from the bow upon the same principle as the levers fixed in the stretcher of the bow-seat of the *England*." All experiments in boat-building are interesting, and it is to be hoped that we may hereafter be favoured with the dimensions of this, Jewitt's latest, and, the Tynesiders are hoping, most successful effort. We return to our text to notice that the New York Yacht Club has decided upon a rule of measurement for time allowances, the basis of which is the displacement of a yacht rather than the so-called "area," as formerly adopted and adhered to. This is determined by the following methods: The areas of three sections, from the water-line to the inter-section of the outer planking with keel, in the case of each yacht, one taken amidships, another equi-distant therefrom to the stern, shall be measured and determined in square feet. The cubical contents of the immersion shall then be calculated by multiplying the sum of the areas of the three sections by length on water-line in feet and decimals, which shall, for the one-fourth the purposes of this measurement, be deemed the displacement of the yacht. The cube roots of the displacement shall be deemed the basis of the comparative allowance of time. In order to apply the basis of measurement, as above, to the sliding scale of allowances, graduated according to time of making race, hitherto in use by the club (but for no other purpose), the cube roots of the displacements shall in all cases be multiplied by 100, thus forming tables of apportionments given in full in the yacht club books.

SAVING LIFE AT SEA.

REPORT OF EXPERIMENTS WITH MR. ROGERS' CONE.

[*The following Report by Captain Robertson, of the Board of Trade, and also the letter from Mr. Lewis, of the Royal National Life-boat Institution, have been forwarded to us for publication.*]

On the 12th May I attended some experiments at Shoeburyness, accompanied by Mr. T. Gray, of the Board of Trade, Capt. Ward, R.N., of the Royal National Lifeboat Institution, and Commander Theobald, R.N., Inspecting Commander of the Coastguard at Southend. The experiments were as follow:—

The mortar used to throw Mr. Rogers' cone or block, with our ordinary whip-line rove through it, was the ordinary service mortar now in use in the army, and formerly used on the coast of the United Kingdom before the rockets (which were found so superior) were brought into general use. The weight of the mortar (brass) used was 1 cwt. 1 qr. 11 lbs., and the bed of wood 118 lbs. The charges of powder used by Mr. Rogers varied from 10 to 12 oz., and the greatest ranges obtained with Mr. Rogers' cone and the double whip-line was, with 10 oz. of powder, 141 yards; and with 12 oz. of powder, 148 and 152 yards, the weight of the cone or block with grapnel being 34 lbs. 8 oz. Several lighter cones or blocks were fired from the same mortar, but the range was less.

The Boxer rocket now in general use on the coasts carried the same double whip-line, with a wooden block and tail in addition, as follows:—First, at 35° elevation, the range was 186 yards; second, ditto, 182 yards, thus giving a greater range of 34 yards to the rocket with the double whip-line over Mr. Rogers' cone with the same line. One of the Boxer rockets was fired with the ordinary rocket line, and the range was 350 yards.

It is quite clear from these trials that neither Mr. Rogers' cone nor the rocket can carry the double whip-line the distance at which wrecks generally occur from the shore; and that in exceptional cases, where vessels come nearer to the shore, the rocket has the advantage over the cone of some 34 yards with the double whip-line; but supposing the range of the cone had been greater than that of the rocket, it has this great drawback, that whilst the stand from which the rocket is fired can be carried by one man on his shoulders, the mortar requires at least six men, and sometimes

eight, to carry it any distance, and the difficulty and danger in getting the mortar down narrow paths and cliffs on a dark and stormy night are serious. Besides carrying the mortar, it would take one man at least to carry one cone or block, whereas two rockets are carried by one man with ease.

Again, the shot or cone, supposing it to reach a wreck of a small vessel, could not well be used owing to its weight. It is a lump of cast iron weighing 34 lbs. 8 oz., and there is nothing attached to it to make fast to the masts or rigging. The grapnel would not be sufficient for this purpose, whilst the block now in use is provided with a tail to fasten it to any place, and does not weigh more than some 6 lb. A great point has been made of the cheapness of Mr. Rogers' cone, but I doubt very much whether the cone will cost much less than the rocket. Of this I could get no information from Mr. Rogers.

In conclusion, I am of opinion that besides being unwieldy, and the disadvantage of requiring so many hands to convey it where the cart cannot be driven, a mortar and cone apparatus as proposed by Mr. Rogers would prove useless at most of the wrecks that occur on the coast; and that the rocket, from its great range when required and its portability, is in every respect vastly superior to Mr. Rogers' cone.

(Signed) R. ROBERTSON.

Royal National Life-boat Institution,
14, John Street, Adelphi.
7th July, 1871.

Sir,—I have the honour to request that you will be good enough to express to the Board of Trade the best thanks of the Royal National Life-boat Institution, for the copy of their Officer's report which accompanied your letter of the 4th instant, on the late experimental trial made at Shoeburyness with Mr. Rogers' proposed apparatus for effecting communications between stranded vessels and the shore, and for hauling out life-boats through a surf.

I am to add, that the report in question fully confirms the one furnished to the Institution on the same subject, by its Inspector of Life-boats, Captain J. R. Ward, R.N.

I am, etc.,
(Signed) R. LEWIS.

The Assistant Secretary,
Marine Department,
Board of Trade.

SOCIETIES,

MEETINGS, ETC.

ROYAL UNITED SERVICE INSTITUTION.—On Monday, 3rd July, a Paper was read by Lieutenant H. Clanchy, R.N., on "Our Naval Officers and the Public Services.—Proposed employment of Her Majesty's ships and Naval officers in connection with the Mail and Troop Services combined." The author prefaced his proposal with a few remarks on the former employment of naval officers in the Packet Service, and shewed how beneficial the effect was in reducing the large numbers of officers who crowded the list. But since that time the commercial element had brought in the contract system, and steam as a motive power had come into operation, so that private enterprise gradually monopolised the mail and troop service, and the Government Mail Service was done away with. By this means the half-pay list was very largely augmented, and much harm was done to the Service, and he pointed out the mischievous effects of the officers being kept so long on half-pay and without the opportunity of becoming efficient by active service. He then proceeded to shew how advantageously the Government might undertake the working of such mail services as Holyhead and Dublin, East and West Indies, West Coast of Africa, Mediterranean, China, Japan, and Australia. He stated at some length the details of his proposed scheme for service, and asserted that a saving could be effected over the present expenditure; that employment could be given to numbers of officers; that an increased Reserve of seamen would be obtained; that the necessary fleet of steamers could be utilized for conveyance of troops, stores, etc., in time of war, and that the Mail Service would be under the direct control of the Government. He then went into detailed calculations as to the probable expenditure and credit, by which it appeared that the annual cost of the Mail Service according to his scheme would amount to £960,000, and the credits to £246,933, leaving only £713,067 as the extra charge to the Crown, against £900,715 now paid to private companies for the same service, thereby effecting a saving to the nation of £187,648 annually.

On the 10th July, a paper was read by Rear-Admiral A. P. Ryder, on "The Higher Education of Naval Officers." We regret that we are unable to do justice to this admirable and exhaustive paper. Its great length and the limited space at our command,

forbid us giving more than the salient points of the address. The author strongly urged the necessity of a thoroughly good rudimentary education for the boys who were destined for the naval profession, and also that they should be chosen from the best kind of boys, such as those from public schools. He deprecated the present system of patronage, and advocated encouragement to public school boys by giving nominations to the schools. He expressed his fear of throwing open the door to indiscriminate admission by public competition, which he thought would be a great evil. The age of admission he thought should be twelve to thirteen if boys are to be admitted as now, so as to give opportunity for weeding out; but if the majority were to be chosen from the public schools, he considered that fifteen would be a good age for admission. He then proceeded to the subject of education and referred to the report of Rear-Admiral Shadwell's Committee, of which he spoke very highly and recommended it to the perusal of all naval officers. He then submitted a draft memorandum of his own to the Admiralty, in which great inducements would be held out to officers to improve themselves in every branch of knowledge, the acquirement of which might be useful in their profession; but no scientific or linguistic attainments would compensate for a lack of a thorough knowledge of seamanship, gunnery, and navigation in their latest development. He proposed a system of examination and marks of merit (cumulative through each grade), which was to rule promotion, and suggested the various qualifications which should be required of the officers. It was also proposed that every facility should be afforded to young officers to study at the Royal Naval College during the intervals between their active service, and certain prizes in the shape of additional pay were recommended to be offered. The author then touched on the subject of navigating officers, and advocated the maintenance of a distinct class of officers for piloting purposes, to navigate the ship under the direction of the captain. These officers he thought should have a special line of promotion, and to meet this arrangement it would be necessary to increase the number of lieutenants, and the commanders', captains', and admirals' lists, in proportion. In conclusion, he earnestly impressed on the meeting the necessity for energetic action in this matter of naval education; he pointed out the advantages that would accrue to the service and to the nation by the higher culture of our naval officers, and expressed his firm belief in the eventual success of the present efforts in the cause of naval educational reform.

Royal Geographical Society.—A Special Meeting was held on Monday evening, July 10th, 1871, Sir H. C. Rawlinson, K.C.B., President, in the Chair.

The Meeting was honoured by the attendance of the Emperor of Brazil. At the opening of the business the President, Sir Henry Rawlinson, in allusion to the presence of His Majesty, who was elected in 1865 one of the Honorary Members of the Society, said they welcomed him, not so much as one of the distinguished Sovereigns of the world, but on account of the earnestness and success with which he availed himself of his exalted position to advance the interests of science, and particularly of geography. Three large volumes of magnificent maps and topographical description relating to portions of the Brazilian Empire, which lay on the table, and brought out under His Majesty's direct auspices, testified to the enlightened interest which he took in these subjects; and it was known that he was the founder of the Geographical and Historical Institute of Rio de Janeiro. His Majesty had shown himself to be actuated by the same spirit as his famous ancestor Prince Henry the Navigator.

Sir Henry read to the Meeting the following letter from their late President, Sir Roderick Murchison. "My dear Sir Henry—I cannot allow this auspicious day to pass, on which so enlightened a sovereign and so warm a patron of geographical science as the Emperor of Brazil deigns to attend our Meeting, which is held in his honour, without expressing to all our Fellows, through yourself, the sincere gratification which I experience in seeing the commencement of your Presidency thus signalised. It was my pleasing duty whilst I presided over the Society to dwell on the obligations we all felt when His Majesty cordially assented to our unanimous desire that he should become one of our Honorary Associates. His Majesty has since afforded us the clearest proofs of the deep interest he takes in all our proceedings. For myself, personally, I have just reason to be proud that this illustrious sovereign paid to your old President one of his earliest visits on his arrival in this country. Highly gratified as I was on that occasion, I felt intensely mortified that my state of health would prevent my being present when the Society was specially called together to honour our Imperial Associate, and therefore I request you to read this brief note, expressive of my grateful feelings, to the Meeting this evening." Sir Henry, in conclusion, stated that an excellent *resumé* of the recent progress of Geographical Exploration in South America generally, was contained in Sir Roderick's Anniversary Address for 1865.

The Emperor addressed a few remarks to the Meeting in acknowledgment of the cordial welcome with which he had been received; speaking in French. He said he took great interest in the objects cultivated by the Royal Geographical Society, and being a constant reader and admirer of English literature, had always attentively followed the proceedings of this as well as other scientific Societies of England. On this account he had gratefully availed himself of the opportunity afforded him of being present at one of the Meetings of the learned bodies of this great metropolis. Personally he thanked Sir Henry Rawlinson for the kind manner in which he had spoken, and said that the great philological attainments of the President, and his interpretations of Assyrian and other ancient inscriptions had long been well known to him. He expressed also his deep regret at the illness of their former President, Sir Roderick Murchison, for whom he entertained the highest admiration, and whose career he had so long watched. He hoped that Sir Roderick might recover his health, and be able to come among them once more.

Mr. C. R. Markham then read a paper on "The Races of the Peruvian Andes, and on the Communication between the Andes and the Atlantic." The portion of the paper relating to the Incas and other civilized tribes of the Andes, was an abstract of a more extended work in which the fruits of original research into all the best authorities on the subject was given, and which will be published, with a new map of the Peruvian Andes, in the "Journal" of the Society. In speaking of the many navigable streams flowing from the fertile regions at the foot of the Andes to the Atlantic, Mr. Markham dilated on the immense benefits conferred on science, commerce, and civilization, by the liberal act of the Brazilian Government in 1867, opening the Amazons to the ships of all nations.

A discussion followed the reading of the paper: the speakers being the Earl of Derby, Captain Sherard Osborn, Mr. Isidore Gerstenberg, Mr. Howard, Mr. F. F. Searle (Medical Officer to the Peruvian Establishments on the Upper Amazons), and Mr. H. W. Bates. The Earl of Derby said that, although he had been in South America, he had not the good fortune to have set his foot on Brazilian soil. No one who had not beheld the scenery of this magnificent continent could fully understand the glory and beauty of nature. It was our duty to be on good terms with all nations, if they would let us, and there were good reasons why Brazil and England should be on the best of terms. Each country possessed what the other wanted, and each wanted what the other possessed.

We possessed enormous capital and skilled labour, practically unlimited. Brazil, on the other hand, possessed an extensive territory, with small capital and a scanty population, and with vast undeveloped resources. Our function was to supply capital and labour, and the function of Brazil was to utilize the capital and labour so supplied. Brazil was a wide and suitable field for emigration, and the climate in many parts was suitable for Europeans. There was a time when England and Brazil had some diplomatic differences, but those differences had been for ever set at rest; and there was now no reason, either socially, politically, or economically, why the two countries should not have relations with each other of the most friendly and cordial character.

LENGTHENING SCREW STEAMERS.

THE operation of lengthening screw steamers has been for some time past most successfully performed at Granton by Messrs. Hawthorn and Co. The vessels are placed on the slip in the usual way, and in the course of a day or two are cut in two and drawn apart to the requisite length. The space between them is then built up, and in a few weeks the vessel is again ready for sea. The steamship *Garrison*, the last vessel lengthened in this manner, which is now about to sail from Granton to Constantinople, was made thirty-one feet longer. This has increased her carrying power from 950 to 1280 tons without diminishing her speed, or rendering a larger crew necessary. The advantage thus gained to owners whose vessels and trade require the outlay is equal, in the case of the *Garrison*, to a new steamer of 350 tons, without the great expense of engines, coal, or crew. Among the steamers which belong to Leith which have been similarly altered, are the *Orient*, *Dwina*, *Vistula*, *Verona*, *Warsaw*, *Edina*, *Stirling*, *Headquarters*, *Oscar*, *etc.*

MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
43	Adriatic Sea—Saseno Island.	Establishment of a Light.
	" " Curzolas Channel—Sorelle Rock.	Establishment of a Light.
	" " Quarnero Gulf—Andrew Point.	Establishment of a Light.
44	Suez Canal.	Directions respecting.
45	Australia—Off East Coast—Elizabeth Reef.	Establishment of a Life-boat.
46	England—East Coast—Filey Bay—Filey Brig.	Alteration in buoy.
47	China Sea—Carimata Strait—Willem Bank.	Discovery of a Bank.
	" " Condor Bank.	Discovery of a Bank.
	Bengal Bay—Aracan—Savage Ild.	Alteration in Light.

NAUTICAL NOTICES.

(All Bearings are Magnetic.)

43.—*Adriatic—Saseno Island*—A *revolving* light is now exhibited 328 feet above the sea on Saseno Island, off Avlona Bay, in lat. 40° 30′ N., long. 19° 13′ E.

Adriatic—Curzola Channel—Sorelle Rock.—A *fixed white* light of the sixth order, 60 feet above the sea is exhibited on this rock. Tower square and white.

Adriatic—Quarnero Gulf—Point St. Andrew.—A *fixed* light showing *white* between the bearings S.W. by W., by West, to N. ¼ W., and *red* from the latter bearing to N.E. by E., 40 feet above the sea, is now exhibited on Point St. Andrew, Port Rabaz, in the Canale di Forisina.

44. *Suez Canal.*—The following additional information has been published for the guidance of mariners using the Canal:—

Port Said.—No material change affecting navigation, has taken place in the approach since the survey made in 1870, with the exception, that the detached bank lying 1½ miles to the eastward of the entrance has almost disappeared, the depth over it having increased from 12 and 14 to 20 feet, the buoy marking it has in consequence been removed.

At Port Ibrahim, the main entrance of the docks and a considerable portion of the north basin has been dredged to 24 feet.

Suez Canal.—By the regulations of the Canal Company all vessels are required to have a head and stern anchor ready for letting go, also hawsers

for warps; and all vessels measuring over 100 tons are bound to take a pilot.

The deepest water is, in all cases, in the centre of the canal; in passing through, it is therefore more a question of careful steerage to keep the ship exactly in the centre, than of pilotage, and it is probable that the commander will be better acquainted with the behaviour of his own vessel than the pilot who is a stranger to her. In the broad portions, particularly in the south part of the Bitter lake, where the shallow water bears a large proportion to the deeper channel, great care is required in the navigation.

Between Port Said and Kantara the depth of water that can be relied on at present, is 23 and 24 feet, and patches of the same depth are found in other parts of the canal, but wherever these patches occur a dredge is always at work in the vicinity. The channel through Lake Timsah is completed to 27 and 28 feet, and the dredging of the anchorage space on the lake will shortly be commenced.

Mooring bollards at a cable apart are fixed in the banks; they will bear sufficient strain to cant the largest ship. In the event of getting hard aground, the best shore anchor is found to be a spar buried horizontally on the inner side of the bank with perpendicular planks in front, the hawser being led through a cutting.

The iron beacons on the several lakes are placed 136 feet on either side of the centre of the deep water in the channel.

In passing round a curve in the canal, the bow of the vessel should be kept as near the inner or convex side as possible, and previous to rounding, the engines of steam vessels should be stopped, that she may pass it at the slowest speed.

The only serious damage which vessels are liable to sustain in passing through the canal is from the propeller coming in contact with the bank, it is necessary therefore, in any class of vessel, to proceed at slow speed, and large ships may find it advantageous to avail themselves of the services of the Company's tugs in preference to using their own screws.

When the wind blows across the canal care must be taken to prevent the ship drifting to leeward, and all unavailable top gear that will hold wind should be sent down. It would be preferable to stop and secure to the bollards rather than to risk damaging the screw by using it near the lee bank.

Suez.—At the mouth of Suez creek allowance should be made for the strong tidal current which sets across the canal, and frequently in the contrary direction of the current in the canal.

The tidal stream between Suez and Chalouf turns to the northward 2 hours before high water at Suez, and runs for 7 hours. It commences to run south one hour before low water at Suez, and continues $5\frac{1}{2}$ hours. At full and change of moon the tidal stream runs north from 9h. 30m. to 4h. 30m., and south from 4h. 30m. to 10h. 0m. It has been recommended that this portion of the canal should be navigated with an opposing tide.

45. *Elizabeth Reef, off the East Coast of Australia.*

The Colonial Government of New South Wales has given Notice, that a life-boat, to aid shipwrecked crews, has been moored in the lagoon of Elizabeth reef.

This dangerous coral reef, which has proved fatal to many vessels, lies at a distance of 350 miles from the Coast of Australia; it is oval shaped, nearly 5 miles long in an East and West direction, and 2½ miles broad. The edges of the reef, with the exception of a few rocks, are covered at high water.

The entrance to the lagoon, on the north-east side, is in lat. 29° 55′ S., long. 159° 6′ E.

The following information has been published for the guidance of seamen.

This boat is placed for the purpose of succouring those wrecked on the reef; it is provided with necessary articles for making a voyage to the Australian continent, including provisions, medical stores, chart and compass, etc. Six casks of fresh water (each containing 15 gallons) are fitted as ballast as well as for use. It is requested that the following instructions be observed, viz.:—

That shipwrecked mariners will write a detailed account of their disaster, with the names of the survivors and those lost, also the place they intend to make for; this document is to be deposited in the nun-buoy and left floating at the moorings.

Navigators visiting the boat are requested to leave a report of their visit, with such intelligence as they may wish to communicate. If bound direct to an adjacent port, they are requested to forward any reports that may be found in the nun-buoy.

46. *England—East Coast—Filey Bay.*—A *black Bell* buoy *with staff and globe*, has been substituted for the black can buoy off the extremity of Filey Brig.

47. *China Sea—Carimata Strait.*—Information has been received of the discovery of two banks, viz.:—*Willem Bank* in lat. 3° 52′ 40″ S., long. 109° 42′ 40″ E., is about half a mile in extent north and south and about a cable broad, it has 3 fathoms water on it and 6 to 8 fathoms close to. *Condor Bank*, struck on by the ship *Condor*, lies N. by E. ½ E., 8½ miles from Nangka island, in lat. 2° 22′ 20″ S., long. 108° 37′ 15″ E.

Bengal Bay—Savage Island Light.—This light, at the entrance of Akyab harbour, has been altered to a *fixed and flashing white* light, showing a flash *every minute*.

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, IN JULY, 1871.

No.	Scale, inches.		s.	d.
104	m = 0·16	Korean Archipelago, Southern Portion, with Views	2	6
251	m = 0·25	Mediterranean—Cape Bougarini to the Fratelli Rocks, including Galita Channels	2	6

Sold by J. D. POTTER, 31, Poultry, E.C.

GENERAL.

ROYAL HOSPITAL SCHOOL, GREENWICH.—On Monday, the 10th July, the Lords of the Admiralty visited this establishment: their Lordships arrived soon after twelve, and were received by the superintendent, Staff-Commander Charles Burney, the boys being drawn up in line. After inspection, the boys were put through some of their evolutions, and the manner in which the lads went through them showed a high state of discipline, and the boys themselves seemed proud of their efficiency. Mr. Goschen then proceeded to distribute the prizes in the hall of the Queen's house, which was prepared for the occasion. After the general school prizes, we were pleased to see that prizes were awarded for seamanship, trades, and other matters.

After complimenting the boys on their state of efficiency, and Captain Burney for so ably carrying out their Lordships' intentions, Mr. Goschen and their Lordships inspected the various departments of the school, with which they expressed their entire satisfaction.

Convinced as we are, that the change that has been made in regard to this establishment is conducive to fitting the boys for the station in life they are expected to fill, and not unfitting them by too high a standard of education, which in these times is so prevalent, we cannot but hope for its success, and we may add, extension. It is certainly a step in the right direction, and we are of opinion that boys admitted for the future should be so on the understanding that they should join the Naval Service, and then with a thousand boys we could reckon on a steady annual supply of two hundred well-disciplined lads from this school alone.

ROYAL NATIONAL LIFE-BOAT INSTITUTION.—A meeting of this Institution was held on Thursday, 6th July, at its house, John Street, Adelphi; T. Chapman, Esq., F.R.S., V.P., in the chair. Various rewards were granted to the crews of life-boats of the Institution for services rendered during the past month. The St. David's life-boat, presented by the Earl of Dartmouth and his tenantry, brought ashore the crew of the schooner *Mersey*, of Liverpool, which had been wrecked on the South Bishop Rock. The Lynmouth life-boat had gone off in a gale and heavy sea, and saved a man who was in imminent peril. The Rhyl tubular life-boat during a strong northerly wind went out to the distressed schooner *Eleanor*, of New Quay (Cardiganshire), which had gone on the Constable Bank, and

assisted her and her crew off the sands, and into a place of safety. Rewards were granted to Mr. Edward McCarron, assistant keeper at the Arranmore Island Lighthouse station, county Galway; and to Mr. Richard Stapleton, the principal light-keeper, and his wife and two daughters, for their laudable services to the crew of the distressed barque *Tropic*, of London. When rescued from their perilous position they were in a most exhausted state, and suffering greatly from hunger, thirst, and exposure, and unable to walk. However, they were all successfully hauled up the high cliff during the night and taken to the light-keeper's dwelling, where they received every possible assistance, and eventually all of them recovered. Other rewards were likewise granted to the crews of shore-boats for saving life from wrecks on our coasts. Sundry very liberal contributions and legacies to the Institution were announced as having been received. A new life-boat had recently been sent by the Institution to Dungarvan, Ireland.

Polar Expeditions.—In drawing the attention of our readers to an article in Dr. Petermann's Mittheilungen, No. VI., containing a further notice of the results and discoveries of the second German Polar Expedition, and particularly an account of the warm climate during three summer months, "the rich and beautiful" vegetation and varied animal life along the east coast of Greenland; it informs us of a number of Polar Expeditions which have already, or are about to start in different directions for the further exploration of the Arctic seas; and we have every reason to expect that the result will not alone be of great interest, but also of advantage and benefit to the daring and enterprising people who are engaged on these expeditions.

1. The American expedition, under the direction of Captain Hall, proposed to proceed northward through Baffin Bay and Jones' Sound, the first attempt in this direction, and therefore of particular interest.

2. The expedition of James Lamont, Esq., with the steamer *Diana* to East Greenland, if failing to reach there before the beginning of July, intends to proceed to King Charles Land, eastward of Spitzbergen.

3. A Swedish expedition, organized by order of his Majesty the King, consisting of two ships, a brig and gunboat, started from Carlskrona, and left the roads of Copenhagen on the 11th of May, under the direction of the indefatigable Professor Nordenskjold, who intends to proceed, in 1872, from Spitzbergen in sledges, drawn by reindeer, towards the Pole.

4. Several Norwegian vessels have again started for the eastern portion of the Arctic sea, where they have been very successful in whale and seal fishery, particularly in 1870.

5. Captain Mack left Tromsö for the survey and exploration of the sea between Spitzbergen and Nova Zemlia, furnished with the necessary instruments by the government.

6. Four other experienced Norwegian shipmasters, "Johannesen, Ulre, Quale, and Nedrevaag," are again navigating between Spitzbergen and Nova Zemlia, and we have reason to expect from them similar valuable results as those obtained by Captain Johannesen during last year.

7. Besides the above, several expeditions are being organized in Russia by the government, as well as by the leading scientific societies.

In these expeditions the English nation is only represented by Mr. Lamont, a private gentleman. A hundred years ago, the government used to organize such expeditions for the instruction and benefit of our naval officers and sailors, and by these means not only greatly contributed to our knowledge in useful sciences, but also maintained our superiority on the sea.

STRANDING OF THE AGINCOURT.—On the 1st July the announcement of the stranding of this fine ship on the Pearl rock, at the entrance of Gibraltar Bay—a danger as well known as the Nab rock—caused no little alarm in the country, and it was still more startling to learn that she had got into that position in broad daylight and when under steam. We are utterly at a loss to account for the cause of this sad disaster; the chart is, we believe, unapproachable for correctness, and the sailing directions so clear that one could almost suppose it to be impossible for a ship to strike it, excepting by reckless mismanagement and neglect. The court-martial will probably elicit the facts attending the case, but to us it seems that the question is, not how the ship got on the rock, but how came she within a mile of it? The following graphic account of the mode in which the ship was got off is from a contemporary: "The *Hercules* first had to pick up her anchor, which had been let go on Sunday for the *Agincourt* to heave astern by. This appeared a rather critical manœuvre, as the end of the cable was buoyed by a lighter close to the *Agincourt's* stern. It was accomplished, however, very cleverly, the *Hercules* at one time just grazing the other's stern, and damaging slightly a boat hoisted up astern. It may not be out of place here to remark on the wonderful turning powers of this ship. Everybody has been fairly astonished at the way this

huge ship will turn about at slow speed, almost like a twin-screw steam launch, and at the same time remarks have not been wanting during the last few days on the skill with which her gallant captain has handled her. The said anchor being weighed, the *Hercules* proceeded to get into her position for towing, and, although this may seem a very easy matter to the inexperienced, yet it is in reality no joke to get a ship weighing 9,000 tons kept in the same spot in a strong current, close to another monster of 10,000 tons, while huge chains, whose every link weighs more than half a hundredweight, are hauled from one to the other. At last, however, the difficulty was accomplished. The *Hercules*, having an anchor down a little distance astern of the *Agincourt*, managed to back her stern close to, while one of the cables was hauled across and secured. This was finished about 11 o'clock, and by the time of high water—viz., 3 p.m.—everything was ready and waiting for the exciting moment. The *Agincourt* had by this time made great progress in clearing out her weights; all the guns, except five or six, had been hoisted out under the energetic superintendence of her commander, and the main engines had been disconnected from the screw and set to work pumping the ship out. She looked very light and high out of the water forward, and appeared to have "pivoted" slightly, all of which signs looked favourable, and on the whole the betting was decidedly in favour of the ship coming off. Besides the *Hercules*, a Spanish man-of-war steamer was made fast to the starboard side, and a steamtug to the starboard bow, all being directed to tow slightly to starboard as well as astern.

"The sight now was one which will not be forgotten. In both ships, as well as in the *Inconstant*, anchored a little way off, the whole of the crews were ranged about on the hammock nettings and half-way up the rigging, to get a good view of the 'launch.' The great steam pipes of the *Hercules* were snorting away, as if they had had enough of standing still and wanted to get to work, while the excitement fore and aft seemed more like the Derby day before the start than anything else. At 3 o'clock, after a good deal of waiting to get the tug made fast and the Spanish steamer, at last there was a hail from the *Agincourt* to the *Hercules*, 'Are you ready?' 'All ready, sir,' was the answer, and immediately afterwards, 'Go on,' slow at first. The Spanish steamer was the first to tauten her cable, which she did with such a will that away went her towing ballards and fell into the water astern, luckily without injuring anyone. The order was now heard on board the *Hercules*, 'Fifteen revolutions ahead,' and then almost immediately, 'Thirty

revolutions;' and as the heavy chain cables groaned and rendered through their fastenings until they could render no more, the *Agincourt* gave signs of being alive by pivotting round until her bow and stern were lying fair in the direction of the strain. The cables were hardly looking straight at their work when the order was given, 'Full speed,' and immediately the water churned up under the sterns of the two ships like a dozen waterfalls, the eddy being driven of course against the *Agincourt's* stern, so that it was impossible from looking at her to tell whether she was really moving or only breasting the frothy stream. At last there was no doubt of it. The marks on shore began to alter, and at the same time there burst out such a cheer as could never be heard anywhere but on board a British man-of-war. Where the cheering first commenced it was difficult to say, but it was instantly taken up by the thirteen hundred voices of both ships and echoed back by those of the *Inconstant*, while the two monsters, tugging away at one another, moved rapidly astern.

The excitement, however, was far from over, as in a very short time the *Hercules* was obliged to slacken speed to pick up her anchor, which, it will be remembered, was kept down to place the vessel in the proper direction; and it was at once seen that the *Agincourt*, having no such incumbrance, would come into collision with considerable force. Happily the sterns of ironclads are hard, and also they are not sharp, like the rams, so there was no fear of danger, and all were looking on with the greatest interest to see the shock. At last it came. The stern walks of both ships were crumpled up like brown paper, allowing the massive sterns to come in contact with a bump which set the masts shaking, and gave the lookers-on some idea, although a mild one, of what the collision when large ships ram one another would be like. The damage done was quite trifling; but the immediate position of the ships was far from satisfactory, for the towing cables had slacked down and got foul of the *Hercules'* screw, so that she was entirely at the mercy of the current and wind. 'Slip the cables' was the order now heard on board both ships, and on board the *Hercules*, 'Hands make sail.' The yards were at once covered with men already to let the sails drop the moment the order was given. This, however, was not required, as the ends of the cables were soon seen flying out of the hawse-holes, and the screw being now clear, the ship was once more under control. The only remaining difficulty was to secure the *Agincourt*, which was still without the aid of her engines, and this was soon managed by two or three tugs which had kept at a respectful distance while

there was any chance of a squeeze between the two ironclads, but now came manfully to the front and walked the rescued ship out into a safe position."

THE ATLANTIC AND PACIFIC CANAL.—The surveys for a canal between the Atlantic and Pacific Ocean are now finished, and the problem becomes one for the capitalist and the engineer, instead of the explorer. Captain Shufeldt has returned home with an account of his labours on the Isthmus of Tehuantepec, and Captain Selfridge may soon be expected with details of his final examination of the Isthmus of Darien. In one of these two regions it seems to be the general impression that the canal must be built, if it is ever built at all—the Nicaragua route, though not yet perfectly surveyed, attracting comparatively little attention.

TO CORRESPONDENTS.

WE hope to insert the letter signed "Caleb Quoten" in our next.

Staff-Commander Kiddle's paper we received too late for publication this month, it shall have attention in the September number.

We beg to acknowledge the receipt of "Les Annales Hydrographiques," published by the Depôt des Cartes et Plans de la Marine, Paris, and we rejoice that the Department is resuming its activity now that the troubles of France are abating.

We welcome a new comer in the cosmopolitan arena of literature. The "Nautical Gazette," of New York, has been in existence one month, and if we may judge from the contents of the early numbers which have been forwarded to us, it will not only benefit the spirited promoters of the new weekly, but will be of great service to the nautical community in general, and of America in particular.

The new Edition of Mr. Thomas Stevenson's "Light-house Illumination," has been received; we shall notice it at length in our next number.

THE

NAUTICAL MAGAZINE.

NEW SERIES.

SEPTEMBER, 1871.

DEEP-SEA THERMOMETERS,

By Captain J. E. Davis, R.N., F.R.G.S.

(Continued from page 525.)

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Experiments for Calorific Effect.

The Philip's encased maximum thermometers (Thomson's) being entirely protected from any effect by compression, it was decided to ascertain by their means the calorific effect produced by the sudden compression of the water in the cylinder; but, as will be seen by glancing through the two series of experiments recorded, there was such a gradual increase in the temperature of the air, and also in the water used for supplying the cylinder, that for any delicate observation, the conditions were not favourable; the observations for calorific effect were therefore delayed until the weather got colder, when a more equable temperature could be ensured throughout the experiment.

In order to ascertain what time it would require for these instruments to take up temperature (as it was of importance they should not be kept under pressure longer than necessary) the following observations were made, viz.:—

Compared two Thomson's thermometers (Nos. 9640 and 9647) in the air with a delicate thermometer (No. 2528); all agreed.

Placed the three thermometers nearly in a horizontal position in a deep dish containing water (temperature 65·4°); when all agreed, set the indices, replaced them in the water, the bulbs of the three

being near together, poured in a little warm water at the furthest side from the bulbs, agitated the water with a pencil, and watched, with a magnifier, the effect. The mercury of the encased thermometers commenced rising almost as soon, and as quickly, as the plain, taking from one to three minutes to attain from two to three degrees, to the exact temperature of the water: this experiment was repeated several times and with the same results.

Poured in a quantity of warm water with the following results.

						m.	s.
From	71·5°	to	75·0°	= 3·5°	it took	0	15
,,	75·0	to	80·0	= 5·0	,,	0	45
,,	80·0	to	81·3	= 1·3	,,	1	0
,,	81·3	to	81·7	= 0·4	,,	3	0
Total time of rising				10·2°.....		5	0

This was an outside period of time, or until a retrograde movement of the mercury was observed as the water cooled: it was therefore considered that five minutes would be sufficient time for the Thomson thermometers to take up the most minute portion of heat observable.

For the purpose of observing this heat engendered by pressure, a Six's unprotected thermometer was made by direction of one of the Committee of the Royal Society, having the partially filled bulb open at the top, with a lip to which was firmly secured by wire a small piece of india-rubber tubing closed at the end, with the view of equalizing the pressure on both columns of mercury, and thus recording the amount of heat due to calorific effect only. A small portion of the mercury on the maximum side was oxidized; but it did not affect the reading, as it attained the same level on the scale of temperature as the minimum.

November 12th.—The following observations were made, day cloudy, all the conditions favourable, Mr. Casella reading:—

No. 1. Pressure = 2500 fathoms = 6817 lbs. Under pressure ten minutes.

Thermometer.	Difference.	Remarks.
11424	+ 0·1°	Temperature in air .....40·0°
9649	+ 0·4	,, ,, tub .....41·6
9645	+ 0·2	,, ,, cistern .....38·8
Committee	....	,, ,, cylinder .....38·0

Heard a crack at 1200 lbs. pressure; on taking the instruments

out, found the Committee thermometer broken: the bulb, to which the india-rubber tubing was attached, was broken off below the bulb; and the tube of the thermometer on the minimum side was broken in one place, and the minimum indicator forced up to the bulb.

Experiment No. 2 (same pressure). Under pressure twenty minutes.

Thermometer.	Difference.	Remarks.
	°	°
11424	0·0	Temperature in air .....43·6
9649	0·0	„ „ tub .....41·2
9645	— 0·2	„ „ cistern .....41·2
		„ „ cylinder.....38·9

It will be observed that the water pumped into the cylinder was a little warmer than that in the cylinder; but as the valve through which it passed into the cylinder is near the top, while the bulbs of the thermometers were at the bottom, the small difference it could have made in the upper water could not have affected them.

By Mr. Casella (previously observed).

Pressure.	Difference.	Pressure.	Difference.
fms.	°	fms.	°
500	+ 0·2	2250	+ 0·6
1000	0·0		
1500	0·0	2500	+ 0·3
2000	+ 0·2		

The result of the foregoing Experiments (some rejected in forming the mean)

0·0178, calorific effect for each 250 fathoms' pressure.

0·18 „ „ 2500 „ „

It would seem almost unnecessary, for the purpose for which this paper is prepared, to record the above observations at all, so small is the result; but as the amount of heat caused by compression is supposed by some to be much greater, it has been thought best to give the figures in full, with deductions therefrom.

Experiments to determine the amount of Heat produced by friction.

To ascertain if any error *could* arise from heat created by friction in a thermometer passing rapidly through the water, one of Casella's Hydrographic Office pattern was towed astern of one of the fast

river-steamers *(Naiad)*, keeping the thermometer well submerged by means of a lead weight attached to the line before it; and with repeated trials at full speed not the slightest difference could be detected.

The Error of the Miller-pattern thermometer as deduced from the Observations (some rejected in forming the mean).

Abridged.

Error per 250 fathoms as shown by hydraulic press	0·161° mean.
Deduct for calorific effect	·018
True error per 250 fathoms	0·143
True error for 2500 fathoms.....	1·43

Mean Errors of Hydrographic Office pattern Thermometers, by testing apparatus, corrected for calorific effect.

Fathoms.	Casella.	Pastorelli.	Fathoms.	Casella.	Pastorelli.
	°	°		°	°
250	1·307	1·482	1500	7·392	7·625
500	2·789	2·664	1750	8·199	9·307
750	3·821	4·279	2000	9·638	10·106
1000	4·853	5·195	2250	10·838	11·438
1250	5·860	6·743	2500	12·270	12·520

By the foregoing tables, it will be seen that the progressive rate of error for each 250 fathoms pressure applied, amounted in Casella's thermometers to an *increase* of effect at the rate of 0·014°, and in Pastorelli's to a *decrease* of effect at the rate of 0·044°: thus, while one set of thermometers show an increase of effect under pressure, the other set denote a decrease, and the mean of the two would be so small a decrease as not to be appreciable; and the practical conclusion is that, by the testing apparatus, the elasticity of the glass is in exact proportion to the pressure applied.

Ocean Observations by Staff-Commander E. K. Calver, R.N.

By the experiments made, a scale could be formed for the purpose of correcting previous observations; but considering that the means used to obtain that scale may be said to be made under theoretical conditions rather than practical, it was of importance to obtain, if possible, practical observations to verify its correctness, and for this purpose those instruments that had been subjected to pressure, and some that had not, were sent on board the *Porcupine*, then about to start on her deep-sea dredging expedition, and a very complete, careful, and systematic series of observations were made by Staff-Commander E. K. Calver, of which the following are the results.

Error of Hydrographic Office pattern Thermometers, as deduced from the ocean observations, corrected for the Standard, the Miller pattern.

Depth.	Casella.	Pastorelli.	Depth.	Casella.	Pastorelli.
	o	o		o	o
250	1·329	1·210	1250	6·286	7·065
500	2·816	2·986	1500	7·058	8·118
750	4·002	4·779	1750	7·301	8·301
1000	5·427	6·422	2000	7·711	8·844

These results are shewn in the accompanying diagram No. 3, together with those found by the use of the testing apparatus, and it will be seen that there is considerable accordance between these determinations; but the progressive rate of error proves that (contrary to the result of the experiments by hydraulic testing) the elasticity of the glass is not regular, or in ratio to the pressure, but that, after continuing regular to a pressure of 1000 fathoms ($1\frac{1}{4}$ tons), it decreases in a compound ratio to a pressure of 2000 fathoms ($2\frac{1}{2}$ tons), when its elasticity nearly ceases.

Comparison of the Errors of the Hydrographic Office pattern Thermometers as found by the hydraulic testing apparatus and by the Ocean Observations.

Casella.					Pastorelli.				
Pressure.	Error.		Per 250 fms.		Pressure.	Error.		Per 250 fms.	
	Press.	Ocean.	Press.	Ocean.		Press.	Ocean.	Press.	Ocean.
fms.	o	o	o	o	fms.	o	o	o	o
250	1·307	1·329	1·307	1·329	250	1·482	1·210	1·482	1·210
500	2·789	2·816	1·394	1·408	500	2·664	2·986	1·332	1·493
750	3·821	4·002	1·274	1·334	750	4·279	4·779	1·426	1·593
1000	4·853	5·427	1·213	1·357	1000	5·195	6·422	1·299	1·606
1250	5·860	6·286	1·172	1·257	1250	6·743	7·065	1·349	1·413
1500	7·392	7·058	1·232	1·176	1500	7·625	8·118	1·271	1·353
1750	8·199	7·301	1·171	1·043	1750	9·307	8·303	1·329	1·186
2000	9·638	7·711	1·205	0·964	2000	10·106	8·844	1·263	1·105
2250	10·838	...	1·204	...	2250	11·438	...	1·271	...
2500	12·270	...	1·227	...	2500	12·520	...	1·252	...
Mean			1·240	1·233	Means			1·327	1·370
Error at 2500 fms. by the means ...			12·4	12·3	Error at 2500 fms. by the means ...			13·3	13·7

By this comparison, although the errors, as found by the two modes of observation, differ at individual depths, or pressure, still the means of Casella's per 250 fathoms are almost the same, and those of Pastorelli's differ only three-tenths of a degree in 2000 fathoms, the extent to which the comparison can be made.

It may be suggested that although the actual quantity of line to which the thermometers are attached in the ocean observations was payed out, the certainty that the line was vertical cannot be so fully depended on, especially at the greater depths; and if from the drift of the ship, by current or sea, the line beneath the surface assumed a curved line, the thermometers would not have attained the pressure of the depth indicated; at the same time, assuming (as is most natural), that the elasticity of the glass is not in exact proportion to the pressure, it would be advisable, in forming a scale for the correction of previous observations, to adopt a curve as nearly as possible between the results of the two modes of observation for each make of thermometer, and this curve is submitted in diagram No. 4.

There can be no doubt that, without the aid of the Miller pattern, by an extended series of observations, a scale could have been obtained to correct the Hydrographic Office pattern to a very close approximation to the truth (in accordance with the proposed first intention of the experiments); but the timely suggestion of Dr. Miller has quite set at rest any difference of opinion as to the instrument for future use.

To correct the deep-sea temperatures obtained by Sir James Ross and others with a class of instruments that cannot be obtained for comparison, observations made by the Miller patterns at a few of the same positions, uninfluenced by known ocean-currents, at as nearly as possible the same time of year as they were obtained in, and at precisely the same depths, would enable a scale to be made for correction which would be applicable to the whole series, and be sufficiently accurate to utilize them.

Aware of the mechanical difficulties attending the construction of these instruments, where men of great experience in their manufacture have failed, it would perhaps seem superfluous to suggest an improvement; still it may be hoped that, with the fault before him, some ingenious mechanic may devise a means to rectify it; the unsatisfactory nature of the indicators is alluded to. From experience gained, there is reason to believe that the exceedingly fine hairs used as frictional springs do not retain all the elasticity they possess when first secured to the bar, but deteriorate by soaking continually in spirits; and it stands to reason that it

should be so, as the spirit must deprive the hair of its natural oil.*

With the above defect in view, the only remedy that suggests itself is, that a thermometer should never be sent down singly, but pairs; and although the occasional divergence of their indications may raise a doubt, a little practice will enable the observer to detect the faulty indicator; but when they agree, greater confidence of correctness will be the consequence.

Deep-sea Metallic Thermometers.

Previously to the experiments and the adoption of the Miller pattern Six's Thermometer (which leaves little or nothing to be desired), the invention of a metallic thermometer that could be depended on for deep-sea purposes was a great desideratum; and although the necessity for one has passed away, a record of those that have been invented for the purpose may fitly be appended to this paper—the more especially as, after the lapse of years, it is often difficult to obtain the original type, or even to ascertain the principle on which they were constructed.

Johnson's Deep-sea Metallic Thermometer.

Invented by Mr. Henry Johnson, to be used simultaneously with his Deep-sea Pressure-guage, in the use of which temperature necessarily became an important element in calculating the depth, in determining how much of the variation in the volume of water indicated was due to variation of temperature.†

This instrument is composed of brass and steel, the well-known difference in the ratio of expansion and contraction by heat and cold of which is taken advantage of for ascertaining temperature. Compound bars of thin plates of these metals are riveted together, which slightly curve in one direction when heat has expanded the brass more than the steel, and attain a slight curve in the contrary direction when the cold has contracted the brass more than the steel. The indicator records the motions under change of temperature.

* This has been partially remedied by Mr. Casella at the suggestion of the author, who, reasoning from the fact that the hair is a fine tube, proposed singeing or burning the end, and thus hermetically sealing it.

† Mr. Johnson's Pressure-guage was tried in various forms; but (apart from temperature) owing, it is believed, to the difficulty of measuring the small difference, in quantity, of water compressed, and of getting that quantity free from air, it was pronounced impracticable for the purpose intended.

Fig. 1.

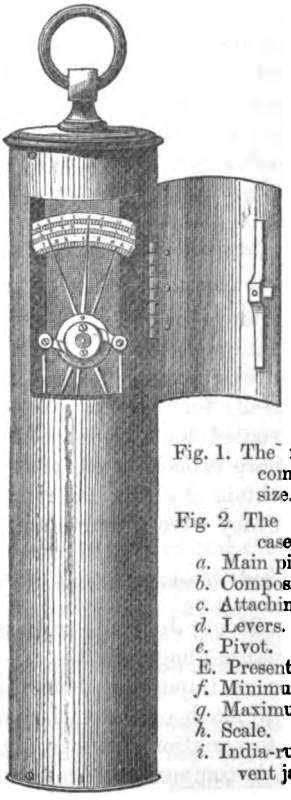


Fig. 2.

Fig. 1. The instrument in case complete: one-fourth size.

Fig. 2. The instrument out of case.

a. Main piece or standard.
b. Composite plates.
c. Attaching plates.
d. Levers.
e. Pivot.
E. Present-temp. indicator.
f. Minimum indicator.
g. Maximum indicator.
h. Scale.
i. India-rubber rings to prevent jar.

In the composition of the bars the proportion of brass (the more dilatable metal used) is double that of steel, or two-thirds of brass to one of steel.

The maximum and minimum indicators are pieces of split brass, which, by its nip, causes enough friction to prevent their being moved by shaking or knocking, at the same time not enough to prevent the free action of the present-temperature indicator.

The pivot on which the indicator works is of gold, and the surrounding parts washed with the same metal, to prevent oxidation.

This instrument has often been condemned from its want of agreement with the mercurial thermometers sent down with it; but now that there is proof of the effect on the latter by pressure, that disagreement is accounted for, and in most cases in which its notification has been rejected it would now be found correct.

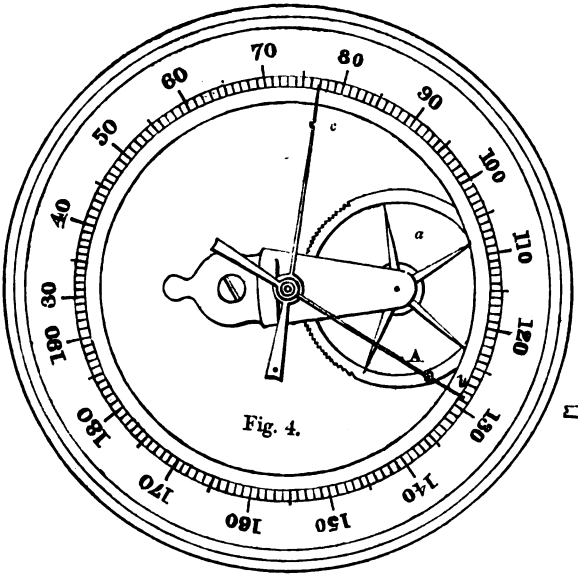
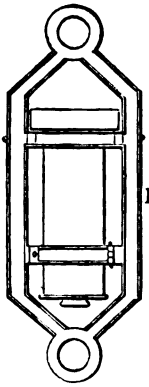


Fig. 4.



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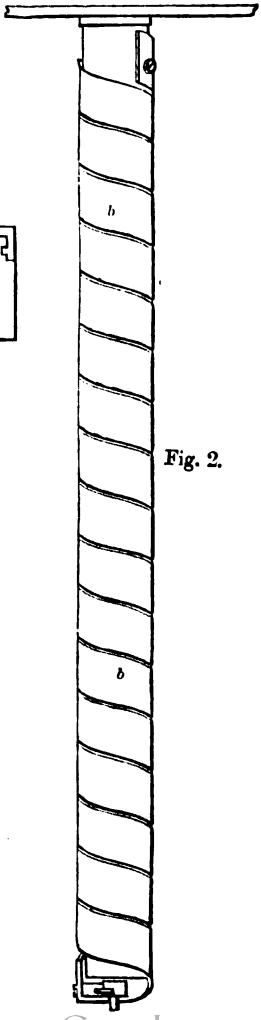


Fig. 2.

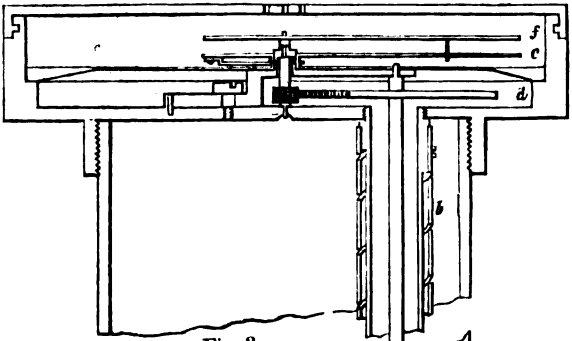
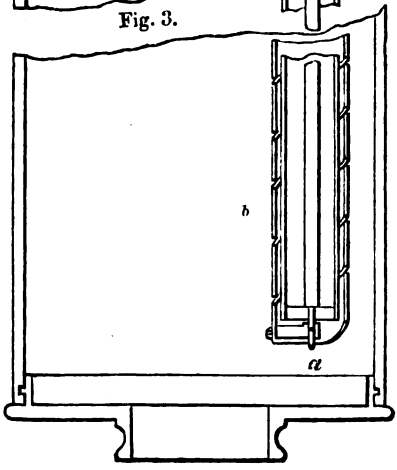


Fig. 3.



Saxton's Metallic Thermometer.

In the Report of the Superintendent of the United States Coast Survey of 1860, is contained an account of the deep-sea thermometric instruments used in the survey of the Gulf-stream; and the instrument mainly depended on seems to have been an adaptation of the Breguet principle of the coil-form of two metals, by Joseph Saxton, Esq., and consists of two stout ribands of silver and platinum, carefully united with silver-solder and coiled spirally, the more expansive metal being within; a coil of gold, to which each metal is soldered, serves to prevent the tendency of the silver and platinum to separate: the lower part of the coil is affixed to a brass stem which passes up through the centre of the coil, while the upper end is fastened to the base of a short cylinder which keeps that end of the coil from turning, and consequently conveys the whole motion of the coil, caused by the unequal expansion or contraction of the two metals, to the lower end of the spindle, the turning of which is communicated to multiplying-wheels placed within the short cylinder, which serve to magnify the motion of the coil and move a hand, which in turn carries with it an index to record the extreme maximum or minimum.

This instrument was found to have a considerable error under pressure, and it is supposed that the solder by which the two metals are cemented together was so affected by the compression as to cause the error; but it may be due to the construction of the instrument itself, as there can be no certainty that the expansion and contraction of the two metals *are* communicated at the end of the spiral ribands, and may not be developed at the sides (the ribands not being close to the bar around which they are coiled).

If the communication of the contraction and expansion could be depended on at the end of the ribands, it would seem that a simple but long coil of wire could be so encased that the direct action could be communicated to an indicator for the purpose of registering the temperature indicated by its elongation or expansion and contraction.

DESCRIPTION OF WOODCUT.

Fig. 1. The instrument complete: one-sixth size.
Fig. 2. The stem and coil: full size.
a. Stem. *b*. Silver and platinum coil.
Fig. 3. Section: full size.
a. The stem. *b*. The coil. *c*. Short cylinder.
d. Magnifying wheel. *e*. Present-temperature indicator.
f. Registering indicator.
Fig. 4. Short cylinder: full size.
a. Magnifying wheel. *b*. Present-temperature indicator.
c. Registering indicator.

Hearder's Metallic Thermometer

is the most simple and has the most direct action of the three: it consists of an iron tube, within which, and secured to the lower part by a socket, is a bar of another metal of unequal expansion with the iron; this unequal expansion is communicated by means of a short fulcrum to a long lever, the upper end of which is toothed to meet a small wheel correspondingly toothed: to this wheel is attached the hand, the index being moved by the hand and kept in its place by means of friction.

An instrument of this description has not been completed as a thermometer; but the author has seen the action of an experimental instrument, and it seemed to answer well.

It is the invention of Dr. Jonathan Hearder, of Plymouth.

THE SMALLS LIGHTHOUSE.

The present lighthouse on the Smalls Rock off Milford Haven is a noble structure, combining elegance with strength; the internal economy of the building is remarkable, while the illuminating apparatus is, if we may use the paradoxical expression, a scientific work of art. Much labour of subtle brains and lissom fingers has been expended in producing the rare mechanism and adjustment by means of which the present brilliant light streams out on to the adjacent sea. But this splendid lighthouse is, as many of our readers are aware, a comparatively modern structure, erected in 1861, in place of an old wooden building, which, although it had done good service in its time, in the latter years of its existence groaned and trembled with the weight of years and the violence of the waves.

We are enabled to publish a brief episode in the existence of the old building, the particulars of which contrast very strongly with the comparative efficiency and security of the present establishment as well as with the accommodation for the keepers.

The account is extracted from an unpublished memoir of an old sailor, whose life was a long series of dangers and hardships. The narrative is in some parts very graphic, and on its own merits is most interesting; it may also we think be serviceable in showing that if a hundred years shows such an advance in lighthouse science, we may still expect to progress, and as time goes on, to

attain to still greater perfection than we have now arrived at, so that the hidden dangers of the sea will be indicated in such a manner, that navigation will be robbed of half its perils and communication between all nations rendered more easy and general.

We print the extract almost verbatim, save one or two alterations we have made to render it intelligible to our readers.

"In the summer of 1776 the lighthouse on the Smalls being finished, Mr. Philips, of Liverpool, the proprietor, called on me at my house at Hertfordwest, and gave me the offer of the government of the said lighthouse, after he had tried many others who refused it on account of the dangerous situation of the place. But I being willing to get a living for my family undertook it, and accordingly agreed with him for sixty pounds a year and my board, and after having entered into articles, embarked on October the third, 1766, with three others which were under my command at Solvah, and got on the rock the same day in the evening, and as soon as I arrived the engineer and his men returned by the same sloop. The weather continued favourable till about a fortnight, and on the seventeenth of October we were visited by a hard storm which washed several of the stays and braces that supported the pillars away; this storm continued two nights and two days and broke several of our lower room windows. Then I began to see that the building was by no means strong enough for the situation; however when the weather grew a little calm we went to work on the rock. One of the men being a smith, and having provided some bars of iron and a few tools, we made new braces and stays and secured them as well as we could. The building was an octagon standing upon nine pillars, three of them were iron, capped and jointed, and six wood; and they were let into the rock four feet and a half and fastened with lead. The length of the pillars from the rock was twenty-four feet to the bottom of the lower room of the lighthouse; the centre pillar was nineteen inches diameter, the three iron and the other five wood pillars were twelve inches in diameter. The stays which were all made of iron ran from the top of one pillar to the bottom of the other thus N, and were nailed to the wood pillars and cramped to the iron pillars, and after having secured them as well as we could we put our tools into the house which stood on the top of these pillars. There was a lower and upper story in the house fixed on the said nine pillars, the lower story was eight feet high and partitioned off, one part for oil, tools, etc., the other part was to sleep in. The upper story was the lighthouse which was twelve feet high, having eight windows which were large and glazed with thick glass, the panes were about twenty-two inches by sixteen

inches square. There were four large reflectors ten or eleven feet diameter, one of them commanded two windows having lamps properly fixed before them, they were seen all round the compass like a globe of fire, being so arranged as to afford a sufficient warning to ships from every quarter.

"I beg leave to mention what a friend of mine observed to me, his name was Mr. Abraham Clibborn, in whose employ I had been fourteen years master, 'Mr. Philips, you are going to a dangerous situation I am in fear for you.' I thanked him for his regard for me and told him I had actually agreed with Mr. Philips and must abide by that agreement, and as many vessels are lost every winter I was willing if I could to save the owners' property, but more especially the men's lives. About the latter end of November in the same year we were visited with a much greater storm than that before mentioned. It began on a Sunday morning and continued until Wednesday night following, the wind about S.S.E., and from thence veered to the W.N.W., a perfect storm, breaking all the windows in the lodging and store rooms. The N.W. window in the light room was blown in frame and all, the sea breaking over the top of the house, came through the ventilators washing away the lead from part of the house, and carrying away the rails that were round the lodging part. It also carried away our hearth and kettle and we were every moment expecting the house to tumble down and an end to be put to our lives. We have no reason to suppose but what this would have been the case had we not well secured all the material we had. We suffered much from violent thunder and lightning and dark and dismal nights, the sea often pouring in upon us like a deluge; none of us had a dry thread for near a month afterwards. In this situation without help and almost without hope I wrote a letter and directed it to Mr. Thomas Williams and put it into an oil cask and wrote on the cask 'Take out the head and you will find a letter.' The cask was found on the next day in Brices Bay, and the letter was conveyed to Mr. Thomas Williams and was sent by him to Mr. Philips at Liverpool. It was near a month before we had any relief from the shore; in the meantime we secured what we could. Two reflectors were broke and many of the windows. I took all the boards I could find and stopped all the holes, and put candles against the whole panes in order to be as useful as our wretched situation would permit in preventing the loss of lives and merchandize. After waiting a month a sloop arrived to our relief. I sent a man that was with me on shore sick, and about a fortnight afterwards the engineer came with another hand and some materials (which I had

wrote for in the letter enclosed in the cask) to mend the brackets. I gave the charge to him to nail the floor, which I was prevented from doing for want of nails, I told him not to meddle with the windows for they were secured and there were lights enough to alarm the ships of any danger; he told me that he would take care of everything and that I might go on shore to refresh myself after my great fatigue. He told me there were forty barrels of oil at Hubberstone for me, I told him I would bring them with me in the sloop as soon as the weather would permit. We put off and the sloop went for the oil, next day the sloop was detained at Milford with the oil on board. About a week afterwards she went to Solvah to take on board some fresh provisions, I went to meet her and was detained there about two weeks, indeed we made several attempts before we could land on the rocks, and when we landed we found the house broke to pieces, all the lower floor broke up, and on one side nothing standing but the pillars, and that was owing to the trapping mentioned before; the light room owing to that stood also by which the men saved their lives.

"When we came to the rock I expected the men to come to meet us as usual, and to throw us an end of a rope that we might land with greater ease and safety, but to our great surprise and mortification not one man appeared. We concluded they were either carried away with the sea or starved for the want of provisions. Land on the rock we could not, and no place to bring the sloop to an anchor. The wind westerly, the south stream running strong, and night coming on, the sloop was almost out of sight, and the boat deep loaded with provisions and so forth, it was with much difficulty we got on board the sloop which got into Solvah that night. The next morning I sent a man to acquaint Mr. Williams of my intention to take the sloop and endeavour to land on the rock in order to see if there were any corpses, and to bring them away to shore for to bury them. We departed the same day with the wind at N.W.; as we made the rock to my great surprise and joy the people appeared on the rock and two of them at the landing-place heaved in the boat with ropes, that we might land. We landed accordingly, I went up to the wreck (for I could call it nothing else) and found the lower floor was entirely stripped off, all the cords and all the boards of one side and but a few of the rafters remaining. All the windows in the light room were entirely destroyed. For Whiteside instead of securing the lower floor with the nails he had brought with him from the land, which I desired him particularly to do when I left him on the rock, and not to meddle with the windows, as everything relating to the lights were sufficient for the present

to give the ships notice of their approach to the rock, he had removed the security I had made, glazed the windows in the light room with common glass which broke to pieces on the first gale of wind taking place, and the lower rooms were carried away through bad management and neglect. Instead of a light room it had become a dark room indeed—I had the mortification to find that my chest had been broken open, my clothes taken out, made use of and spoiled, my journal defaced and made use of, and sundry other things belonging to me were missing and irrecoverably lost. From the preceding causes, it was found impracticable to shew any more lights. The engineer and the rest of the men threw their things into the boat to get into the sloop in order to get to the land: finding I could be of no further service I left the rock with them to save my own life, and we arrived at Solvah the same night. The next day I inquired of the men where they were the preceding day when I came to the rock. One man whose name was Adams informed me that they were ordered by the engineer not to shew themselves till they saw me coming up the ladder, when they intended to throw a tub of water on my head, and they were provided with a quantity of dirty water for that purpose, and that he cried very much when they saw the boat going off.

"This part of my distress on account of the Smalls which lasted near six months, when I came to Harfordwest I wrote to Mr. John Philips at Liverpool, and sent to him the following account, 'That by the tryal I had made it appeared to me that the house stood too low by twenty feet, that there was wanting a new set of pillars, each pillar to be forty-eight or fifty feet long by thirty inches diameter, well made, and of the best timber, and the hoops to be made of copper instead of iron. This would raise the house nearly twenty feet higher, by which means the sea would empty itself between the pillars and not break upon the house, and many other improvements which is not necessary to mention here.' I waited a long time for an answer from Mr. Philips, but received none; I enquired of Mr. Thomas Williams (who was Mr. Philips's agent) if he had received any account from Mr. Philips, he answered me that he had not, but informed me that as Mr. Philips could not get an Act of Parliament for the lighthouse he was of an opinion it would be dropt.

"In the beginning of April, 1777, Mr. Williams called at my house and desired me to meet him at the sign of the Ship and Castle because he had something to communicate to me, I gave him the meeting accordingly. He told me again that he had not heard anything from Mr. Philips, but that he wanted a person to

go master of one of his vessels called the *Lucy* for a voyage or two, until Mr. Crann came home from America, to whom he had given the promise of being master of the vessel in question. He was going to load her with coals for port of London, and if I would go master he would with pleasure commit the vessel to my care in consequence of the high opinion he had of me, and if the light on the Smalls was re-established I might quit his service when I pleased. I accordingly agreed on the Saturday and on the Monday following I went on board and got the vessel loaded and sailed for the port of London, where I met Mr. Philips, who shewed me great respect, and appointed a day for me to give him a meeting at the Hambrough Coffee House at eleven o'clock, as he wanted to go with me on the day appointed to the Trinity House. The night before the said day appointed by Mr. Philips I received a very pressing letter from my owner, Mr. Williams, that I must immediately return with the vessel. In consequence of the very pressing letter from my owner I was deprived of having an opportunity of giving Mr. Philips the proposed meeting, and also lost all his favours so that he would never speak to me afterwards, notwithstanding he owed me twenty pounds at the same time."

MERCHANT SHIPPING LEGISLATION.—V.

CRIMPING.

(Continued from page 540.)

We will now pass in review the chief provisions of the Imperial Statute (the Merchant Shipping Act, 1854), having for their object the regulation of the engagement and discharge of seamen, the payment of wages, and the security of the seamen's effects. These provisions all bear directly or indirectly on the subject of crimping.

In the first place the Act requires (Sections 122 and following) that Mercantile Marine offices shall be established at the ports of the United Kingdom. The general business of these offices is:

To afford facilities for engaging seamen by keeping registries of their names and characters;

To superintend and facilitate their engagement and discharge in manner therein mentioned;

To provide means for securing the presence on board at the proper times of men who are so engaged;

To facilitate the making of apprenticeships to the sea service;

To perform such other duties relating to merchant seamen and merchant ships as are thereby or may hereafter under the powers therein contained be committed to them;

By Section 141, superintendents of Mercantile Marine offices are required to assist in the binding of apprentices to the sea service. Fees are to be paid by seamen and masters in respect of engagements and discharges and binding of apprentices at Mercantile Marine offices.

By Section 146, the Board of Trade are empowered to grant licences to persons to engage or supply seamen or apprentices for merchant ships in the United Kingdom. By Section 145 every apprentice serving on board any foreign-going ship must be taken before the superintendent with his indentures every time that ship proceeds to sea.

By the 147th Section any unlicensed person who engages or supplies any seaman or apprentice to be entered on board any ship in the United Kingdom is liable to a penalty not exceeding £20. Any one employing an unlicensed person for the purpose is liable to a like penalty, and so also is any person who knowingly receives or accepts to be entered on board any ship any seaman or apprentice supplied or engaged contrary to the provisions of the Act. By the next Section a penalty of not exceeding £5 is imposed on any person who demands or receives either directly or indirectly from any seaman or apprentice, or from any person seeking employment as a seaman or apprentice, or from any person on his behalf, any remuneration whatever other than the authorised fees.

As regards agreements the law requires that in the case of British foreign-going ships the agreement, if made in the United Kingdom, shall be signed by each seaman in the presence of a superintendent of a Mercantile Marine office, except in the case of substitutes engaged in the place of seamen who have duly signed the agreement, and whose services are lost to the ship, within twenty-four hours of the ship's putting to sea. These substitutes may sign the agreement when at sea.

British home-trade ships, and ships belonging to foreign countries are not required by law to engage their seamen at a Mercantile Marine office. Agreements required by law to be entered into at a Mercantile Marine office, must, to be legal and binding, contain certain particulars, *e.g.*, the nature and as far as practicable the duration of the voyage; the number, description, and rating of the

crew; the time they are to be on board; the amount of wages of each seaman; the scale of provisions; regulations as to conduct, and as to fines for petty acts of misconduct. The agreement is to be read over to the seaman by the superintendent of the office, and each seaman is to sign in the superintendent's presence. A duplicate of the agreement is retained by the superintendent; where the voyage is short an agreement called a running agreement is made to extend over six months, and to include all foreign-going voyages made in the ship to which it relates in that time.

The crews of home-trade ships may be engaged before a superintendent (Section 155), and an agreement made between the owner and the men may include service in several ships provided the nature of the service is specified. Seamen engaged in the colonies to serve on board a ship registered in the United Kingdom, must be engaged before a superintendent; and seamen engaged to serve in any ship belonging to a colony other than the one in which the engagement takes place, must be engaged before the same officer: but colonial ships engaging their crews in the colony in which the ship is registered are not required by the Merchant Shipping Act to engage them at a Mercantile Marine office. Various colonial acts however require this to be done. Seamen engaged in a foreign country other than a British colony must have the engagement sanctioned by a British consular officer.

Alterations, interlineations, or erasures in agreements, are illegal unless duly attested to have been made with the consent of all parties. A copy of the agreement is to be kept accessible to the crew, and seamen discharged before the commencement of the voyage are entitled to compensation. A seaman has power to allot a certain portion of the wages he earns during the voyage to his wife, etc., during his absence. This is done by an allotment note, and all stipulations as to allotment are to be entered in the agreement, such as the amount of allotment, the times of payment, etc., and the allotment note is to be in a form sanctioned by the Board of Trade. An allotment note can be sued on summarily by the wife, father, mother, grandfather, grandmother, child, grandchild, brother, or sister of a seaman; who can recover unless it is proved to the satisfaction of the Court that the seaman has ceased to be entitled to the wages out of which the allotment is payable. In proceeding on an allotment note, it is sufficient for the claimant to prove that he or she is the person mentioned in the note, and that the note was given by the owner, or the master, or some authorised agent of the ship, and the seaman is deemed to be earning his wages unless it is proved to the Court that he is not (Section 169).

Seamen serving in British foreign-going ships must not only be engaged, but must be discharged before a superintendent, if the discharge takes place in the United Kingdom (Section 170); and each seaman is entitled to an account of his wages from the master before the discharge takes place (Section 171); this account is to be in a form sanctioned by the Board of Trade, and is to shew the wages due and all deductions claimed therefrom on any account whatever. Superintendents are empowered to settle questions arising between the parties if they agree in writing to refer them to him. (On Section 171 we shall have something special to say further on.)

Besides the protection intended to be afforded to the seaman, of the accounts to be rendered to him, and the manner and place of the payment of his wages, he has the further advantages of a special money order system and a special savings' bank system, each of which has been established exclusively for his benefit. These have both been very largely made use of by seamen. Money can be remitted by seamen to their friends and relatives not only from places in the United Kingdom, but from many places abroad, and there is every reason to hope that the system may be further extended abroad. The amount deposited in the seamen's savings' bank during the year 1870, was £33,174 4s. 5d., and the balance of former years £58,309 2s. 4d., and the amount of money orders in 1870 was £312,482 6s. 3d. These figures speak something in favour of the seamen, and indicate something in favour of their families. The money, or a good part of it (£404,000) is money diverted from unclean and improper women, from stews, brothels, beer shops, and crimps, to gladden the homes and relatives of seamen. It is only when we know how great a sum is the small part of the wages of seamen passing into the bank and money order office, that we can realize the magnitude of the sum annually swallowed by the crimp.

A seaman's right to wages and provisions commences either at the time he commences work, or at the time specified in the agreement for commencing work, which ever first happens. No seaman can by any agreement forfeit his lien upon the ship or be deprived of any remedy for the recovery of his wages (Section 182), and wages are no longer dependent on the earning of freight. The old rule that "freight is the mother of wages" has long since ceased. Wages run on in the case of wreck to the time of the wreck, and, in case the seaman is left ashore under a certificate of unfitness to proceed to sea, down to the date of that certificate (Section 185), but are not payable during refusal to work or during imprisonment.

And wages are to be paid (Section 187) in the case of home trade ships within two days after the termination of the agreement, or when the seaman is discharged, and in other cases (except whalers, where special arrangements are required to meet the case of oil money, and blubber and bone money), within three days after the cargo has been delivered, or within five days after the seaman's discharge, which ever first happens. At the time of discharge a seaman is entitled to be paid on account a sum equal to one-fourth of the balance of wages due to him, the penalty on the master or owner for non-compliance is an extra payment as wages of two days' pay for every day's delay, not exceeding ten days in all. The account of wages is by a former section, to be delivered to the seaman twenty-four hours before he is paid off or discharged. Seamen can sue for their wages in a summary manner, but cannot sue for wages abroad unless discharged abroad or in danger of life. The Board of Trade have power in their discretion to refuse to pay the wages of a deceased seaman to any person not being related to the testator by blood or marriage, who claims under a will made elsewhere than on board ship, unless signed and witnessed by a superintendent or minister, a justice of the peace, or a consular or customs officer. It was the practice formerly for improper women and crimps and Jew slopsellers to obtain wills from seamen every voyage, but the above provision has materially checked such proceedings, though it has not entirely abolished them. (Sec. 200.) There are special provisions for payment of just claims by creditors, and for preventing fraudulent claims on the estates of deceased seamen, and the Board of Trade has absolute power of refusal in certain cases. This provision is also aimed at crimps, slopsellers, etc.

As regards discharge abroad, whenever a seaman is discharged abroad it is to be done, if in a colony, before a superintendent or other similar officer, if in a foreign country, before a consul, who is to act in the same way as a superintendent of a Mercantile Marine office does upon a discharge at home. And in every such case, and also in cases of men left behind on the ground of desertion, a certificate of the fact is to be obtained from that officer. Before the certificate is given the master of the ship is to deposit with the officer in money, if he can, in a bill on the owner if he cannot, the wages due to the seaman; and also, except in cases of desertion, or cases where he provides the man with other employment, or otherwise satisfies the officer that no expense will be incurred in respect of the seaman, such a sum of money as may be necessary in order to provide the seaman with a passage home. [Sec. 205.]

The forcing ashore or leaving behind any seaman or apprentice wilfully or wrongfully abroad is a misdemeanour. Distressed seamen found abroad are relieved and sent home at the expense of the British taxpayer, and masters of British ships are compelled to take them. [Secs. 211 and 212.]

By Section 232, any seaman is allowed to go ashore to make complaint to a proper officer or justice of the peace against the master or any of the crew, and the penalty on the master for not affording an opportunity, when the service of the ship admits of it, is £20. And in order to protect seamen from impositions, Sec. 233 provides that sale of and charge upon wages shall be invalid. Under that Section no wages due or accruing to any seaman or apprentice shall be subject to attachment or assessment from any Court, and by Section 234, no debt exceeding five shillings can be recovered from a seaman until the end of his voyage. Sections 235 and 236 impose penalties on boarding house keepers for overcharges, and on any person who takes into his possession, or under his control any monies, documents, or effects of any seaman or apprentice, and does not return the same or pay the value thereof when required by such seaman or apprentice.

There are also special penalties for desertion, for neglecting or refusing to join or to proceed to sea—for absence without leave, unless it is before sailing, for quitting the ship without leave before she is secured, for acts of disobedience, assault, combining to disobey, for wilful damage, etc.—Sec. 243; and masters may apprehend deserters without warrant, and deserters may be sent on board in lieu of being sent to prison—Sec. 246. There is a penalty on seamen for giving a false name for the name of the last ship in which they served.

There are of course many other provisions in the Merchant Shipping Act which bear indirectly on the engagement, discharge, and payment of wages of seamen, but we have referred to the principal provisions on these points. We shall now have to point out how far, and why some of these provisions have failed to accomplish the end for which they were designed, and to indicate the direction in which, in our opinion, improvement is practicable and necessary.

The first and most important consideration is the necessity for bringing about an arrangement with foreign countries as regards the engagement and discharge of seamen. Seamen of any country can be engaged to serve on board British merchant ships, and British seamen can be engaged to serve on board ships belonging to almost every country; so long therefore as we have no arrange-

ment whatever with the principal maritime States, regulating by common interest and common action the engagement and discharge of seamen, so long will the crimp always reap a fruitful harvest, and so long will the seaman, the shipowner, and the State suffer.

It is hopeless for us at home to endeavour to put down the crimp when we know that the crews of foreign ships coming here can and do find him much employment, and when we find, as we do, that it is often difficult, sometimes even impossible, at some ports abroad to obtain any real assistance whatever from the proper authorities in arresting deserters from merchant ships. The difficulty in the way of a satisfactory understanding on this point is no doubt to be found in the reluctance of British lawyers and British courts of law to subordinate themselves to foreign consular officers in this country, and probably the British lawyers and British courts of law are right. It would no doubt be a monstrous thing for British courts and the British civil force to be required to give effect to sentences passed by foreign consuls in this country on members of the crews of foreign ships, but the same thing (monstrous or not) is done for us in many foreign countries. The absence of any arrangement on the subject of deserters, and the engagement and discharge of seamen was aptly illustrated a few days ago in the case of the United States frigate in the Thames. A great number of the crew deserted, and the police authorities had no power to interfere. The authority of the United States Consul was nil. He had no power to call on the police to arrest a single man, and the police had no power to arrest them if he had called on them to do so.

During the time of the civil war in America, the crews of British ships afforded many men to swell the ranks of the Federal Army and Navy. It suited the interests of certain parties to look with equanimity on desertions from British ships then, and on the lawlessness of the crimps, who sometimes superseded the necessity for desertion by kidnapping whole crews. The British shipowner suffered and chafed but did nothing. The United States may not be so patient, and it is within the verge of possibility that they may see the necessity for effecting some mutual understanding.

The next point for consideration is whether some alteration is not called for in the nature of agreements, and in the terms in which they are expressed. If the terms of the agreement are inelastic or not ample, the seaman often gets a discharge abroad on the ground that the voyage on which the ship is actually employed is not the voyage described in the wording of the agreement. And as a rule, the courts or tribunals acting on the principle that a seaman has a right to know the nature of the employment he enters,

generally decide in favour of the seaman where any doubt can be said to exist. Crimps, especially New York and Quebec, make a handsome living by fomenting disputes as to the terms of agreements. The British shipowner in order to make the agreement comprehensive in its terms, has made it very wide but has overreached himself even here, for it is now held that most of the agreements are so vague and general in their terms as to amount to no agreement at all. So that between agreements too precise in their terms and others too vague, the master and his crew are provided with a source of infinite contention, which with the assistance of the crimp, sometimes set to work by the seaman, sometimes set to work by the master (where plenty of wages will be forfeited by desertion), and sometimes acting *ex mero motu*, is made the most of to the loss of the owner or underwriter and the British taxpayer.

The Merchant Shipping Code as introduced in 1871, would to a certain extent have met the evils resulting from the present system of agreements; but would scarcely have gone as far as many persons think desirable. It would not be just to a seaman who engages to serve in a ship employed in a trade known and recognised as a short and healthy trade, if he were under the same agreement, and for the same wages to be sent on a voyage to a notoriously unhealthy place, or to a place or region where exceptional hardship would have to be endured, or exceptional and special services rendered. For example, a seaman engaged to serve to and from the Mediterranean, would have reasonable grounds for objecting if his ship were sent to the West coast of Africa. The seaman has a right to know the general nature of the service on which he is to be engaged. On the other hand so long as he is not taken to any exceptionally unhealthy place, or to any place to which ships usually employed in the like service are not sent, it is no hardship to him if the names of one or more of the countries, ports, or places to which he is sent are not stated in the agreement. Voyages now often partake, more or less, of the nature of seeking voyages. There ought to be every facility for conducting them, and there ought to be no possibility of a crew throwing up their services during a seeking voyage, solely because the agreement is not strictly accurate in naming the places of call. In all probability, at the time the agreement is signed, the owner and master know no better than the seamen exactly where the ship will be required to go during the prosecution of her voyage.

Another point is that good would be done if agreements were more in the nature of agreements for certain trades, and with

certain owners, for a certain time, than agreements for a special voyage in a special ship. For instance it would be a great boon if an owner of several large ships, or a large company could enter into an agreement with seamen for service in all or any ships afloat, in harbour, or in dock. By this means the seamen could be shifted about from one ship to another, could take their spell of harbour work, could have constant employment and constant pay—instead of engaging as for a fresh service for every voyage. The Merchant Shipping Bill of 1871 meets this proposal to a certain extent, but scarcely goes far enough. There can be no question that one of the most practical of all steps to abolish crimping, is to reframe the law in the spirit we have indicated, so that owners of ships can enter into agreements with seamen for their services generally, for a period of time and for any sort of work, instead of as at present specially for one ship and for one duty. For instance, A. B. might agree to serve at sea as well as in port in the ship or ships belonging to C. D. for a period of (two years), so long as the ship or ships of C. D. in which A. B. is engaged to serve does or do not go to the West coast of Africa, to the North Pole (or does not go to any other places especially named). Certain trades would always command a special rate of wages.

The next point to be taken up is the advance note. The advance note like the unclean woman is a fact palpable and unpleasant, a fact ever present, always coming forwards, the root of evil, a malady the law has tried in vain to abolish. The evil will and must exist however we may preach and pray against it. Existing, we must wrestle with it. We cannot abolish it, all we can do is to make its presence as little mischievous as possible, and keep it in subjection and under active supervision. If there were no advance notes there would be no crimping. The bill proposes to make it illegal for a shipowner to give more than a month's advance, or if the shipowner does give it that he shall not be at liberty to deduct it from wages due to the seaman. This is no doubt a strong measure of interference between employer and employed, but it is demanded. So long as a seaman wants an outfit, so long must money be advanced to him; and so long as money is to be advanced on any pretence whatever, the crimps will get it. The only thing to be done is to reduce the amount of advance to the very smallest compass. The proposal to make advances in clothes, etc., instead of money is of course silly, and would if acted on give rise to a system worse than the truck system.

The next point relates to the settlement and payment of wages, and here it is that immediate alteration is wanted, and that a just

consideration of circumstances at the hands of shipowners is called for. In the printed memorandum issued by the Board of Trade explaining the alterations intended to be effected by the Bills of 1870 and 1871, Mr. Farrer states that, "Great evils arise from the fact that men are obliged to leave the ship on her arrival at her port of discharge and then to wait for some days until they are paid off, being thus detained in the port of discharge, and unable to return to their own homes. According to the present law the seaman is entitled to be paid three days after the cargo is delivered, or five days after the seaman is discharged, which ever first happens; and he is also entitled to be paid on account at the time of his discharge one-fourth part of the balance due to him. It is, however, uncertain whether by the time of discharge is meant the time of quitting the ship, or the time of settlement of wages. And, however this may be determined, the section is in practice inoperative. By the clause in the Bill of 1871, it is proposed that the time at which wages become payable, shall be the time at which the seaman quits the ship, and is thrown on his own resources; and that if not paid at that time the wages shall continue to run and be earned until the time at which they are actually paid; thus giving the owner an inducement to pay as soon as possible. Provision is made by Sec. 140 for the deposit of wages with a superintendent, in any case in which the seaman, being satisfied as to the amount due to him, wishes to leave the port for his own home before the wages are paid. And provision is also made enabling the court to disallow accruing wages in a case in which the delay is caused by a dispute concerning the amount, in which the seaman is in the wrong."

By a clause in the Bill as introduced in 1870, the wages of a seaman who leaves the port for home after giving the superintendent power to receive them for him were to run and continue until actually paid. By the section as it now stands in the Bill of 1871, the seaman before leaving is to agree to the time of payment, and the wages are only to begin to run afresh in case of default of payment at that time.

An enactment of the nature contained in the Bill of 1871, would doubtless do much to bring about a more satisfactory state of things. There is no reason why the wages due to a seaman should not be paid when due; and under the peculiar circumstances attending the termination of a seaman's engagement, it is particularly hard to his family, if he happen to have one, that he should be compelled to loaf about in a strange town, and borrow money from the class who are his greatest enemies, when he might at once, were he fairly treated, proceed home and save expense and

temptation, and perhaps escape from contagious disease. Where a seaman's services terminate at the port or place at which he resides, it is to his advantage and to the advantage of his family that he should be paid speedily; but when his services terminate at another place, the necessity for immediate settlement, if that settlement must be made before he can get home, is doubly pressing. Take the case of a ship whose crew were engaged at and belonged to Newcastle or Glasgow. The ship sailed from Glasgow or Newcastle as the case may be and will eventually return there; but the port at which she arrives in this country on her return voyage and discharges her cargo is London. Her crew are not employed and do not earn wages after the ship is in dock, they therefore cannot remain by the ship. They cannot return to Glasgow or Newcastle, because the owner not being expressly required by law to make a prompt settlement of wages, and the provision as to payment on account being a dead letter, the settlement is delayed, and the men being without funds have no means of getting home. It seems monstrous that any necessity should exist at the present day, for our urging on the attention of owners the justice of a speedy settlement of seamen's wages, or of providing them with means to get home to their families; but that necessity nevertheless does exist. The omission of owners to make prompt payment, or to make any payment on account, as the law obviously intends, or to take steps to rescue their men from the necessity of borrowing for the barest necessaries of life, is anything but creditable; and when we bear in mind that the borrowing is done of crimps, Jews, and boarding house keepers, and that the very act of borrowing is rushing into the toils of these people, and when we further bear in mind that all this time the seaman has a balance due to him which remains unpaid, and may have a wife and family in want of assistance, we are led to enquire on what principle this treatment of the seaman can be justified; and we are bound to confess that to us it appears to arise from an utter absence of principle and to be wholly unjustifiable.

The Bill of 1871 is right in requiring that wages should run till they are paid, and also in affording facilities for settlement of the seaman's wages in his absence by the superintendent of a Mercantile Marine office; but something more appears to be required. A time might with advantage be fixed for the settlement, say at the most thirty-six or forty-eight hours after the arrival or after quitting the ship, and after that time the wages should be double for every day's delay. The old provision might also be retained and be acted on that a portion of the wages due to each seaman, at

any rate sufficient to send him home should be handed to him as he quits the ship; but perhaps the greatest improvement of all would be to give to the superintendent at the port where the man resides, power in certain cases to effect a settlement, instead of the superintendent at the port where the ship arrives. For instance, if a ship owned at Newcastle and manned by a crew of Tyne men were to discharge in the Thames, it might be a matter of convenience to all parties, seamen and owners alike, if the men were paid on account a sufficient sum to take them from London to Newcastle and were to have their wages settled at Newcastle. This would be as easy as settling the wages at London after the men have left the port, at all events it would be better than keeping the men in London away from their friends for days, idle and debauched. The end to be attained is not to keep a man in a strange port and give him money to spend there, but to send him to his own home and family at the earliest moment after he arrives in the United Kingdom, and to secure the settlement of his wages within a fixed and reasonable time.

Allegations are often made that the wages forfeited by seamen for desertion offer a bait to a needy and unscrupulous master or owner, which tempts him to facilitate or at all events not to check desertion. There may, as some persons say, not be much truth in this allegation, but at all events it will have no foundation in fact if the Bill of 1871 becomes law, for that Bill provides that wages forfeited for desertion shall go to the Mercantile Marine Fund. There will be no inducement then, whatever there may be now, for masters to connive with crimps to bring about desertion. Mr. Farrer's Memorandum on the Bills of 1870 and 1871, in speaking of seamen discharged or left behind abroad, is to the following effect:

"The clauses concerning discharging or leaving seamen abroad are entirely recast, but are new in form rather than in substance. Whenever a seaman is discharged abroad it is to be done, if in a colony, before a superintendent or other similar officer; if in a foreign country, before a consul, who is to act in the same way as a superintendent of a Mercantile Marine office does upon a discharge at home. And in every such case, and also in cases of men left behind on the ground of desertion, a certificate of the fact is to be obtained from that officer. Before the certificate is given the master of the ship is to deposit with the officer in money, if he can, in a bill on the owner if he cannot, the wages due to the seaman; and also, except in cases of desertion, or cases where he provides the man with other employment, or otherwise satisfies the officer that no expense will be incurred in respect of the seaman, such a

sum of money as may be necessary in order to provide the seaman with a passage home.

"As between the shipowner and the seaman the expense of relieving him and of sending him home is to fall on the shipowner, unless a Court of Summary Jurisdiction in a colony, or the consul in a foreign port, adjudge them to be paid by the seaman, in which case they may be deducted from the wages.

"As between the Government and the shipowner the expense of relieving and sending home the seaman is to fall on the ship.

"As between the Government and the seaman the expense is to fall on his wages. The wages deposited with the superintendent or consul are to be applied by him, in the first instance, in payment of expenses incurred in relieving or sending home the seaman, and the balance, except in case of desertion, to be paid over to the seaman."

The shipowner and shipmaster, like CÆSAR'S wife, should be above suspicion. They will, at all events, be beyond any suspicion of promoting desertion to appropriate forfeited wages, if the Bill becomes law.

Another fertile source of disagreement between owners and masters is the question of unseaworthiness of ships. Mr. Plimsoll, the member for the thriving seaport of Derby, introduced a Bill to regulate the shipping trade in this respect. But either owing to the seamanship of his constituents being at fault, or to the Honourable Member's opportunities for visiting the ships in Derby not being sufficiently ample, he failed to make any progress with his Bill, or to enlist any sympathy, and withdrew it in favour of a Bill introduced by Mr. Fortescue, and which, whilst this article is being put into type, will probably be passed through the legislature. We propose, in our next number, to review and consider that Bill and the Chain Cables Bill, which is also at the present moment under consideration. If a ship is seaworthy, the seaman ought not to say she is not, and if she is not seaworthy, the owner ought not to say she is, and to compel seamen to go to sea in her, or accept the alternative of a residence in gaol. The new act will reduce the crimp's chances of fomenting discord; for facts will be able to be brought to light. At present they cannot be brought to light, and the men can be sent to prison; or, to save trouble, the master lets the men go and engages substitutes from the crimp to prevent delay. In future, when the facts can be brought to light, the men can only be sent to prison if they deserve to be, and the ship will be detained if she is unseaworthy.

We must not omit to refer to those advertisements which may

sometimes be seen in the newspapers, where the advertisers offer their services in obtaining employment for a boy as apprentice or midshipman. Their offer to obtain the employment named is disinterested, since under the Act they are liable to heavy penalties if they receive any remuneration whatever for rendering assistance of the sort. Widows and other persons who want to place their boys out in the sea service should look with grave suspicion on the majority of these advertisements, and should apply at once to the Registrar General of Seamen, 6, Adelaide Place, London Bridge, whose duty is, by the law, to afford facilities for apprenticing boys and sending them to sea, and who will besides, on application, give a list of some persons who have been convicted. The advertisements of quack doctors and of crimps ought both to be put down with a very strong hand, and we are glad to find that the Bill of 1871 prohibits the publication of advertisements by crimps and other unauthorized persons to procure places on board ship. The Board of Trade Memorandum says that this provision "is intended to prevent a practice which has prevailed in London, of issuing false and fraudulent advertisements to procure places on board ship by persons, who having obtained money for so doing, are unable to fulfil their promises." We only wish that advertisements of quack doctors could be made an offence in like manner.

There is a provision in the Bill for licensing porters for seamen's luggage; this we are glad to find. If an orderly set of porters amenable to control are licensed to look after seamen's luggage, and if all unlicensed people are to be punished if they act as porters, the "hammock snatcher," the crimp's attendant imp, will have to emigrate. There are several minor points in which the law is considerably improved, but we have not time to notice them now.

In concluding our remarks, we wish to say that we do not think that shipping agents, beyond the superintendents of Mercantile Marine offices, ought to be wanted at all, and that until arrangements can be made with foreign countries in the direction we have indicated, there will not be any very noticeable diminution in crimping either here or abroad. We do not look, as many people do, to much assistance in diminishing crimping from any so-called religious movement; we believe, as we have already said, that the law of this world, which as applied to repressing vice is the law of God, will make an impression on the ways and dealings of crimps; we desire to see our Statute law amended, and we leave others to expound that law that needs no amendment. We would however ask them not to confound the operation and effects of two things entirely different, and not to suppose that they

can do what they cannot do, and not to expect to do by Statute law that which is impossible. Those engaged in seamen's missions must endeavour to make seamen good, moral, and respectable; all we can hope to do by amended legislation, by penalties and vigorous exertion, is to make the occupation of a crimp unprofitable and our seaports too hot for him.

MARINE PAINTINGS.

In the different critiques of the paintings which are annually exhibited in the spacious galleries at Burlington House, comparatively little notice is taken of what are termed marine paintings. Indeed, it is difficult at the outset to define what constitutes a marine painting. We once saw a work thus described, which consisted of the hold of a fishing smack "peopled" by two or three figures and a quantity of fish, the animate figures admirably painted and the fish realistic enough to make one's mouth water. Herein the merits of the work began and ended. The smack was mounted on what, without much exaggeration, might be described as a bright green feather-pillow with other green feather-pillows beyond. The picture, artistically speaking, was marine in the sense that a marine store merits such appellation. As well term a Royal Marine a sailor. Such works are of the shore, shorey, and so great is their abundance one ceases to wonder at the anomalous, but not uncommon, expression, "the foreground of a sea landscape."

If you want to see marine paintings, says one, go to the Painted Hall at Greenwich. True, there are some paintings there we could stand at for hours, in admiration of their manipulation; but even among these great pictures, a sailor finds much incongruity and ignorance displayed. Look at that *Lord Nelson's Victory of Trafalgar*, by Turner. Nelson would hardly have recognized his own ship mounted as she is on a platform—which we believe was necessitated from the original sketch of the picture being taken from the old craft as she now lies in Portsmouth harbour with no lower deck guns, or provisions in, and, by no possibility could the grouping in the foreground of the picture ever have been accomplished on salt water. As for the sails, they are far more like dimity than canvas. Then note the picture next to it, *The Victory of the Nile*. The blowing up of the *L'Orient*

grandly realized, but the incongruity of representing a vessel under sail passing close alongside her without being in the least degree affected by the explosion, is, to say the least, remarkable. The reflected light of the burning mass is admirably depicted, but how the ship under sail is to clear the boats and spars almost under the forefoot perplexes us. Then turn to those wonderful pictures by De Loutherbourg. We dwell delightedly on that group of boats, admire the spirit he has thrown into the drawing of those men engaged in a hand to hand fight; but what *will* become of the poor fellows? the two ships are bearing down upon them "with a full flowing sheet," driving the billows before them. The scene as it is here depicted could not possibly have occurred.

The Destruction of the Spanish Armada, by the same painter, is fine in effect, but the ships are badly drawn. If we go back to older painters we have as great incongruities as in the more modern. One example will suffice: *Sir E. Hughes engaging a French Squadron*, 1782. This is fairly painted, ships well drawn, sails in pretty good proportion and shape, and the masts in similar accord with truth; but we have the wind blowing one way for one squadron, and another way for the other. The right hand line of ships are close-hauled on the starboard tack, while the left hand line—lying nearer in the wind's eye—have their yards braced in and all the sails full.

The painting of Sir Samuel Hood's action is artistically meritorious, and not much out in naval knowledge, although a first-lieutenant would not be satisfied with those mast heads, or the way in which the rigging is put over them.

Chambers's picture of the *Bombardment of Algiers* is also a good painting, showing carefully studied parts of a ship, and, if we except a kind of grandiose mode of treatment, the painter's license has not been greatly abused.

It may be thought that we are rather hard upon the painters. We admit that it would be unreasonable to expect "shore men" to be up to all the details of ships and their doings. At the same time we cannot agree in the popular notion that if an artist produces certain effects, and thereby makes a telling picture, it is all that is to be desired. Landseer would not paint an animal without studying its characteristics, and by the same rule a marine painter has no right to give us a picture of a ship without carefully studying the model, its rig, and proportions.

What we maintain is that where there is water of the sea or river, represented on canvas, and that water is associated with ship, brig, ketch, hoy, or vessel, the two should be in strict realistic

keeping; and although it be a painter's license to make the one subservient to the other, the proprieties should not be outraged with impossible vessels, or water incapable of keeping them afloat. We do not go to the length of the proverbial boatswain whose criticism was so severe that he would condemn a picture as worthless if the seizing of the lower rigging had one turn more or less than what was proper; but we decidedly object to topsails that would never hoist, or if hoisted could never come down,—to ropes that lead from anywhere to nowhere with no purpose,—to hulls which if the lines were continued below the water would at once prove that such a ship could never float, or if she did it would be bottom uppermost.

Our visit to the Royal Academy Exhibition of this year was not altogether unsatisfactory. We certainly found a good deal which offended our nautical ideas, but that was compensated for in other respects. A few remarks on some of the principal sea paintings exhibited, may perhaps be interesting to some of our readers.

We were especially delighted with one by Mr. R. P. Beechey, whose name is no doubt familiar to many of our readers. The subject title of his picture is a verse from Campbell's spirited and well-known song

> "The only flag that freedom rears,
> Her emblem o'er the seas,
> Is the flag that braved a thousand years
> The battle and the breeze;"—

As is here depicted. None but a sailor could have painted such a ship, and none but an artist such water. If correct portraiture be a merit, Mr. Beechey's picture has it. This is veritably the stern of the old *Britannia*. There she is in all her glory, as we ourselves have seen her in the good old times when ships were "things of beauty" and life. Alas! that they should be now only known on canvas. The pitch of the leviathan of that day gives a grand idea of the old ship, while the light on the rising wave relieves the heaviness of the mass it bears. As far as we can judge there is much very worthy of praise in this picture, and very little to find fault with. For the sake of Marine art, we hope Mr. Beechey will give us many more sea pictures.

A picture by Mr. J. C. Sketchy we cannot say we were so well pleased with. His subject is *A gallant rescue: naval incident of the French war*, and although little fault may be found with his colouring, yet his treatment of the subject is not satisfactory. It is very evident that he knew little about nautical matters, and the story of the incident is not quite clear. How the seven hundred

brave lives have been saved is not apparent; all we see is one ship in a very uncomfortable position, and another with sails all out of proportion on the port tack very near her, the sea by no means that of a gale. We fear the boatswain would fall very foul of such rigging and yards.

Mr. W. L. Wyllie is a promising artist for marine subjects. *The Old Bellerophon*, and *Rotten Row, Portsmouth Harbour*, are both capital paintings. They are faithful likenesses of our "brave old ships," and are calculated to make a tar of the old school meditate on the mutability of things in general and ships in particular. The *Bellerophon* being represented under an appropriate night effect, we were somewhat astonished at the ensign being hoisted, but nevertheless the young artist may be congratulated on the general truthfulness of his work. Since he carried off the Turner medal, given by the Royal Academy, he has painted nothing so thoroughly satisfactory as the *Old Bellerophon*.

There is much to be said in favour of Mr. E. Hayes' picture, *Freshening gale, Scarborough fishing boats returning to harbour*. The sea is lively, the boats are correctly drawn and the pier, lighthouse, and figures are effectively rendered; but if the scene were real we should feel rather nervous about the ship anchored immediately to windward of the pier, and should consider the sooner she got underway the better for her and the pier. The deficiency in nautical knowledge however is apparent only to a small minority of observers, still it is not correct. No seaman would dream of anchoring in such a position as is shown in this picture.

In sundry other pictures we observed a want of truth as far as the technicalities of seamanship are concerned. In the *Breakwater at Gorleston, Great Yarmouth*, by Mr. Calcott, we are quite at a loss to know what causes the ship in the centre of the picture to pitch as though there were a heavy sea on. The water is brilliantly green, and the number of vessels crowded into the scene is certainly remarkable. Mr. Knight's picture *The Channel Fleet off the Lizard* is well done. The ships are correctly drawn, and the roll of the vessels in the sea, suggested to us that we were also at sea. We might say many good words for numerous other sea pictures, notably Mr. C. R. Ricketts' *Deal lugger and the Sabrina life-boat rescuing the crew of a Norwegian barque, The Cone trees—Coast of New Jersey*, by Mr. W. T. Richards, in which the effect of the sea rippling on the shore is excellently rendered, as it is also in Mr. Nesbitt's *The Bass Rock from North Berwick: Morning*. Mr. Hunter's *Becalmed* is very truthful, and recalls pleasant memories of lazy days in the vicinity of the line. Mr. E. Duncan's somewhat mournful picture

"Upon the watery plain
The wrecks are all thy deed,"

is by no means unsatisfactory; the haze caused by the spray is extremely well rendered.

There are many other sea pictures on which we cannot now dwell, but having taken up the subject rather late in the year we cannot and do not profess to do justice to them all. We do not claim to be art-critics, but in our special line we consider we ought to express an opinion. We are glad to see that there is no lack of marine subjects in our art exhibitions, for we consider that it shews there is yet plenty of the right sort of feeling amongst us as regards the sea and its associations. It is art which in great measure keeps alive the spirit of enthusiasm which makes nations healthy and vigorous; poetry and music have performed their part in this respect, and painting also has, all down the ages, aided in firing men to noble deeds, and encouraging elevated thought,—thus adding to the vigour of the nations so influenced, and not the least to the vigour of England. Feeling this, we are glad to do what we can to encourage art, and as the years go by we hope to be able to chronicle greater progress in painting, particularly as associated with the sea and its ships.

This progress however will certainly not be achieved unless artists who attempt marine painting, make a pretty close study of ships and their movements, and gain correct ideas on the general subject of navigation.

ON FINDING THE AZIMUTH BY THE TRAVERSE TABLE.

By the aid of the accompanying little table the azimuth of a heavenly body may be obtained from the ordinary traverse table generally within about half a degree of the truth; and, by interpolation, it may even be determined within a very few minutes. It is available for all latitudes from the equator to 60° N. or S., and for all altitudes from 1° to 90°. The only element required to be observed is the altitude: the latitude and declination may be determined with sufficient accuracy by estimation. Those inclined to adopt it are recommended to place it in their nautical tables immediately before the traverse table.

AUXILIARY TABLE.

Lat.	A	B	Lat.	A	B	Alt.	C	Alt.	C	Alt.	C
1°	100	2°	31°	117	60°	1°	100	31°	86	61°	48
2	100	3	32	118	62	2	100	32	85	62	47
3	100	5	33	119	65	3	100	33	84	63	45
4	100	7	34	121	67	4	100	34	83	64	44
5	100	9	35	122	70	5	100	35	82	65	42
6	101	11	36	124	73	6	99	36	81	66	41
7	101	12	37	125	75	7	99	37	80	67	39
8	101	14	38	127	78	8	99	38	79	68	37
9	101	16	39	129	81	9	99	39	78	69	36
10	101	18	40	131	84	10	98	40	77	70	34
11	102	19	41	133	87	11	98	41	75	71	33
12	102	21	42	135	90	12	98	42	74	72	31
13	103	23	43	137	93	13	97	43	73	73	29
14	103	25	44	139	97	14	97	44	72	74	28
15	104	27	45	141	100	15	97	45	71	75	26
16	104	29	46	144	104	16	96	46	69	76	24
17	105	31	47	147	107	17	96	47	68	77	22
18	105	32	48	149	111	18	95	48	67	78	21
19	106	34	49	152	115	19	95	49	66	79	19
20	106	36	50	156	119	20	94	50	64	80	17
21	107	38	51	159	123	21	93	51	63	81	16
22	108	40	52	162	128	22	93	52	62	82	14
23	109	42	53	166	133	23	92	53	60	83	12
24	109	45	54	170	138	24	91	54	59	84	10
25	110	47	55	174	143	25	91	55	57	85	9
26	111	49	56	179	148	26	90	56	56	86	7
27	112	51	57	184	154	27	89	57	54	87	5
28	113	53	58	189	160	28	88	58	53	88	3
29	114	55	59	194	166	29	87	59	51	89	2
30	115	58	60	100	173	30	87	60	50	90	0

Note.—The numbers may be taken out for the nearest half degree of latitude and altitude by taking the means. Thus, for lat. 49° 30′, A is 154, B 117; and for alt. 54° 30′, C is 58.

Explanation of the use of the Table.

The elements required are the latitude, declination, and altitude, each to the nearest degree.

From the table take out A and B for the latitude, and C for the altitude.

Then enter the Traverse Table

With A as distance and declination as course and find departure.

With B as distance and altitude as course and find departure.

When lat. and dec. are of *different* names *add* these departures.

When lat. and dec. are of the *same* name *subtract* the first* departure from the second.

* Should the first departure exceed the second, subtract the second from it and find the azimuth as before. But in this case subtract it from 180° (Ex. 3).

Then with C as distance and the sum or difference of the two departures, as departure, find the *course*. This course, with 90° added, will be the true bearing of the body from North in North Latitude, and from South in South Latitude; and towards East or West, according as the body is East or West of the Meridian.

Having found the true bearing of the body as above directed, the Variation and Deviation may be ascertained by the ordinary rules.

EXAMPLE I.

(Latitude and Declination of *different* names.)
Given:—Lat. 50° N., Dec. 10° S., Alt. 20° (East of Mer.)

We have A = 156, B = 119, C = 94 (by Table).

27·1
40·7
67·8

True Bearing N. 136° E.

Here 156 as dist. and dec. 10° as course give dep. 27·1.
119 ,, alt. 20° ,, ,, 40·7.
Also 94 as dist. and 67·8 as dep. give 46° for course.
Hence the true bearing is 90° + 46° or 136°, as above.

EXAMPLE II.

(Latitude and Declination of *same* name.)
Lat. 40° N., Dec. 10° N., Alt. 30° (East of Mer.)

We have A = 131, B = 84, C = 87.

22·7
42·0
19·3

True Bearing N. 103° E.

EXAMPLE III.

Lat. 52° N., Dec. 20° N., Alt. 10° (West of Mer.)

A. = 162, B = 128, C = 98.

55·4
22·2
33·2
110°
180

True Bearing N. 70° W.

In this case, as the first dep. exceeds the second, it cannot be subtracted from it, and therefore we subtract the second from the first; and we must in consequence subtract the course + 90° from 180° in order to obtain the true bearing; or, which is the same thing, take the *complement* of the course.

A. C. JOHNSON, R.N.

NOTES ON NAVAL FLAGS.

III.—MODERN NAVAL FLAGS.

ON considering the Maritime Flags of all nations and glancing from one to another of the many different standards, banners, and pennons, with their several devices, one fact having reference to their historic interest strikes us as singular. We notice the ascendancy of the Roman Eagle. With this favourite emblem of power we are more familiarised than with any other borne nationally or individually in the olden times, those times in which war was the dominant principle and purpose of life. It was the symbol of the Cæsars; as such, it lived out a great life, setting beak and claw in the heart of foreign peoples, sweeping nations together under the dominion of its black wings, before there was anything like a recognised hieroglyphic of royalty in England. As the badge of the modern growing powers of Prussia and Russia, the Eagle of the Cæsars is formidable again, the one ensign which the dear old Union Jack has reason to watch with something of a jealous eye.

These two countries displayed very similar standards, the Eagle in both being double headed and crowned, until within the last few weeks when the German Empire took back the Eagle with the one head, symbolising a dominion that means neither east nor west, but universal;—black as night, having lost, to quote the *Times*, "even the red talons which were his in the last centuries of the old empire."

"Arms do speak," said one of the ancient heraldic writers; and truly, those borne upon the wings of the modern eagles are full of significance. The arms on the wings of the American, Prussian, and Russian eagles tell of territory added, of dominion extended, of growing greatness; but the gorgeous shield emblazoned on the wings of the Austrian eagle, combining the arms of Hungary,

Bohemia, Castille, Leon, and the Lombard-Venetian kingdom, tells only of glory long since departed, and shews no sign of modern vigour.

The French imperial eagle, now sadly dejected, was also copied from the Cæsars, and was assumed by Napoleon in lieu of the worn out lilies of Bourbon and Anjou, when he put on the purple. In reference to these lilies, it may not be uninteresting here to note the fact that the famous *Lys* of France can by no means claim undisputed right to a representative alliance with the vegetable kingdom. The question as to the real signification of the symbol is mooted in ancient heraldic treatises; some authors affirm it to be a spear head ornamented, and refer to the heraldic bearing of a leopard's head thrust through with a spear, typical of triumph after the chase, "Why, they say, thrust a lily into a leopard's mouth?" Others again lean more widely to the idea which allies the *lys* to the floral world, and that such was the leading impression of Chaucer's time, we glean from his several allusions to the "fleur delice."

"Her necke was whyte as fleur delice."

The origin of the name is another disputed point: Louis VII. was the first sovereign by whom the badge was borne, and it may therefore be simply the "fleur-de-loys," or lories; or it may derive its name from the water-lily or yellow flag, that grew upon the banks of the river of the same name that flows into the Scheldt, the upper part of which was French. The Boke of St. Albans ascribes to it a heavenly origin, such as is claimed by the sacred green banner of the Mahommedans. The lilies, according to this ancient volume, were "certainli sende by an awngell from heuyn, that is to say iij flowris in manner of swerdis in a field of azure, in which certain armes were geuyn to the foresayd king of France, in sygne of everlasting trowbull, and that he and his successaries all way with batail and swerdys shuld be punished." It is probably owing to the grace and beauty of this device, that it has been so often reproduced, and though we ourselves have effaced it from our standard, we yet retain it as a decoration to the crown of our sovereign.

Reverting to the Eagle,—we have not quite done with beaks and talons yet,—which replaced the golden lilies and their historic centuries, its career has been a very chequered one so far, beginning so brilliantly, as if in that beginning were condensed all the victories of old Rome, and being in these latter days dragged through defeat, and shame, and national disgrace. First the Austrian and Prussian Eagles drop before it, then it traverses the white steppes

of Russia to measure strength with the grim bird guarding the great forests of pine, the domes of venerated mosques, the huts of serfs; and it is carried back ignominiously wounded. We all know the story of that pitiful retreat; hunger, cold, death before, and Moscow burning in the rear. This was the beginning of the end. Then the desperate bird dares the fury of the English Lion, or "Leopard," as Napoleon derisively called it, and gets worsted utterly in the struggle; low indeed it is lying now among the standards of Europe, and they are the talons of Prussia that have dragged it down.

The Russian standard looks very like the Austrian, also with a yellow field. The badges of the several divisions of the Russian empire are displayed in shields upon the eagle's wings, Moscow being separately represented by the figure of a knight riding a white horse, galloping, which tramples beneath its hoofs

> "A dragon grete and grimme
> Full of fyre and also venymme,"

the dragon being pierced through the head with a lance, according to the old custom which generally so depicted the monster, probably from the reason that it was regarded as an emblem of sin or heresy, a thing to be cast down and conquered. Yet in the case of our Arthur, and as instanced in the Danish invasions, the dragon "fulle austere" indicated defiance simply. It was Peter I., rightfully surnamed the Great, who was the real author of modern Russia. To him she owes her navy. The individual intellectuality of this one man did more for Russia than all the centuries before his time. He gave to his country a fleet worthy of being so called, after having toiled as a common carpenter at Saardam, and having surveyed with careful intelligence the great ships being raised in English dockyards. Dying, he left his navy in possession of two hundred and forty ships of war. His legacy to his country was richer yet; he bequeathed to it new vigorous life, social, military, and naval, new ports and seas and fortresses and provinces, new commerce, new halls of art and science, and a new capital.

We have already in a former paper, given a brief sketch of the Union Jack, the "meteor flag of England," that shone so brilliantly in the Bays of Aboukir and Navarino, that has defended its honour so stoutly, and maintained its supremacy so unflinchingly, almost from the time when the sovereignty of the sea was claimed by John. Through all its long seafaring fighting life the English Jack found no rival tougher to deal with than the flag of little Holland, and the jealous contest was, on the whole, by no means decided in favour of England until Admiral Duncan sunk the hope

of the Dutch Ter Veer Jack, in the engagement off Camperdown, and left the united crosses without a rival on the water.

Many other nations have likewise adopted a "Jack," some of them as unlike as can be to that of our own country; for instance the Jacks of America and Flanders bear no crosses; the Flushing Jack displays a vase, surmounted by a crown, and the Dutch a shield, and the Hanover the famous white horse. There are many of Westphalia. Quaint stories are recorded of instances in which the Union Jack has been intentionally slighted by foreign powers, and has with English pugnacity asserted its dignity, and secured the tributary homage that it claimed as its right; but space will not permit us now to refer to them.

Another favourite figure found on the naval ensigns of England (in the Royal Standard), New Zealand, Spain, Belgium, Norway, etc., is the lion. The lion is essentially a royal symbol, and hence, there is scarcely a royal standard that does not bear it on its arms. In speaking of the French Eagle, we just now referred to the irony of Napoleon in styling the lions of England *leopards*. It is true that they are so termed by many old heraldic writers, and as such are mentioned in the Bok of Caerlaverock (1300); and we are acquainted with the emblem of the Plantagenets rather in the leopard than the lion form; nevertheless the objection of French heralds to the representation of the lion gardant, that is with his face turned full to the spectator, as being the posture of a leopard, called forth the anger of the quaint writer Guillim, who declared that by raising such a protest, "they offer great indignity to the *roiall beast* in that they will not admit him to shew his full face, the sight whereof doth terrify and astonish all the beasts of the field, and wherein consisteth his chiefest majesty."

Some of the most interesting flags—interesting more in a past than in a present sense,—are among those most gorgeous in colour; these are modern flags yet, in so far that they are hoisted upon certain occasions as the standards of their respective countries, but it is the glory of a day gone for them beyond recall, that lives in their silken threads. Here is Spain, once the discoverer of a new world, the field of Bourbon ambition;—poor now, but there was meaning once in the proud lions and eagles, the lilies and the castles on her shield; and Sardinia's beautiful flag, will it ever ride the waves really great again? can Magenta and Solferino, or the successes of the "red, white, and green," suffice to wipe away the national lethargy occasioned by the sloth of ages?

The Turks have always in all their engagements, whether by sea or land, evinced a spirit of courage, and the military discipline of

the troops of the Ottoman empire was the admiration of Christian states during the sixteenth century. The ships of the three admirals of the Turkish fleet bear each a particular name and flag, an account of which we subjoin from Steinitz. "These names," he gives, "are Kaperdona, Patrona, and Ryola. They carry the Turkish flag (a crescent and stars on a red field), also—that of the high admiral, a silver streak with a double blade; of the vice-admiral, a silver cannon; of the rear-admiral, three silver balls upon a red field. Besides which the captain pacha alone, but only on solemn occasions, raises the *Fughra* (or the initials of the grand signor) on a red field, which, upon its rising and lowering, is always honoured with the imperial salute of twenty-one guns."

In the battle of Navarino, the ships of the Ottoman fleet carried the crimson flag, displaying a crescent and a sword, at their peak; on the commencement of the engagement they were drawn up in the form of a crescent in two lines, boarded with their motley crews, picturesque in their white turbans, their small brown jackets, and their wide trousers, eyeing with savage courage the hostile pennons of the allies; at its close, when daylight had disappeared unperceived, owing to the dense smoke of the cannonading, they were scattered and destroyed; then in that magnificent bay the darkness of night was dispelled by the sad light of burning vessels.

The maritime, in fact the political power of Turkey, will stand fast so long as she retains Constantinople. To keep it, to hold the passage of the Bosphorus and the Dardanelles, is her security; let her lose these, and she is a castaway among the nations, and the reign of the crescent and the stars is over. Then would come a "final partition" of her territory and her day is done. Give Russia Constantinople and Russia has the key which would unlock to her the dominion of Europe. She has always wanted to get that key within her grasp, and Napoleon was sensible of her covetousness in the matter; "Qui aura Constantinople," he said truly, "aura bientôt tout le reste." "The Dardanelles," declared the Emperor Alexander, "are the keys of my house." But the keys are yet in foreign keeping; the heads of all fleets are turned towards the Black Sea; even the sleepy old lion, or leopard, of England, would probably get up and shake his shaggy mane and open his wide mouth with thunderous roar, ere Russia should quietly, or with armed arrogance, sweep this choice bit of eastern Europe within the boundary of her vast dominions.

MAR TRAVERS.

LIFE-SAVING HAMMOCKS.

Amongst the various articles designed to save life on occasions of disaster to ships, perhaps one of the most natural was a seaman's bed or mattress, composed of buoyant materials. Since the space on shipboard for the stowage of anything that is not indispensable is necessarily very limited, and in trading ships may often be of considerable money value, it is evident that all rafts, life-buoys, and life-belts, labour under great disadvantage, in that they are of no use except for the one object which is their immediate function, and that they may, in the majority of cases, be kept through the whole period of a ship's existence without ever once having to be employed. Hence it only too commonly happens that the shipowner, shipmaster, and seamen, all alike, prefer running the risk which does not appear imminent, to putting up with the inconvenience that is always present. The expense of providing such things is likewise nearly always grudged.

To meet these objections, various articles of the necessary equipment of a ship have, from time to time, been proposed to be converted into floating bodies to serve as life-buoys, such as casks and water-barrels, benches, chairs, and sofas, deck houses, sky-lights, etc., and as above stated, seamen's mattresses or beds.

In consequence of so comparatively few fatal accidents happening to ships of war, it has been principally with a view to their being employed in passenger and trading vessels that such things have been hitherto proposed. The great risk, however, that will be incurred by ships of war, in future, of foundering rapidly with all on board from the probable general use of torpedoes and steam rams, has led thoughtful naval men to meditate seriously on the subject, and to consider what means it may be possible to adopt to lessen the great amount of loss of life which may be apprehended as likely to take place on such occasions. Amongst others is Rear-Admiral A. P. Ryder, an officer who has ever been indefatigably zealous in promoting the welfare of the noble service to which he belongs, and on the efficiency and superiority of which the high position of this country must ever depend. On page 636 will be found a paper by Rear-Admiral Ryder, read by him at the United Service Institution, on this subject, containing an account of some experiments to test the buoyant properties of an ordinary ship's hammock when lashed up for stowage in the nettings, and suggesting that the Admiralty should cause further

experiments to be made, including the trial of mattresses stuffed with different buoyant materials.

Recent experiments have proved that an ordinary sized cork hammock mattress, of the average weight of about 7½ lbs., after being immersed in fresh water for an hour and a half, has sufficient buoyancy to support above the surface a weight of more than 37 lbs., which amount will support an average sized man with his head and entire shoulders above the water; and that after twenty-four hours' immersion, its buoyancy is not greatly diminished. There can be no doubt, therefore, that such mattresses would afford invaluable aid to any persons in the water who were unable to swim, or even to the best of swimmers if heavily clad, or having to remain some time immersed before being rescued.

In a ship of war, hammock mattresses thus rendered buoyant would be especially suitable, since the hammocks, being stowed on the upper deck, would always be immediately at hand; and in the event of sudden accident to a ship, such as the explosion of a torpedo under her or her being run down by another vessel, there would be a hammock for each of the crew; and a few spare ones might be kept stowed in the nettings for the purpose of practising men in their use on suitable occasions, which would also then be available for the use of the officers of a ship on any such emergencies as those above referred to.

It would undoubtedly be necessary that a ship's crew should learn, by experimental trial, how to make the most of such aid, for, except in the case of a life-belt, which is securely attached round the body, a person may be drowned even with an amply buoyant article within his reach, from not knowing how to grasp it or how to use it advantageously. The most effectual mode of using such beds would be best ascertained by experiment, but we apprehend that it would be found to be by bending the hammock, as lashed up and stowed in the netting, and bringing the two ends together, thus forming a species of life-buoy, shaped somewhat like a horse-collar, which the person using it would pass over his head and under his arms, in which position it would closely encircle his body. The two ends of the hammock would, of course, be securely lashed together, which might be quickly done by the ordinary lanyards by which the hammock was hung up when slept in.

The best material for the hammock itself would also be matter for consideration, and we are inclined to think one made of closely woven cotton canvas would be both more buoyant and much more water-tight than the coarse hempen material commonly employed.

The hammock lashings might also be of manilla rope, which is more buoyant than tarred hemp.

We believe that cork mattresses have already been adopted to a considerable extent in the Russian Imperial Navy; and we have reason to know that their adoption in that of France was under consideration at the time when the late unfortunate war commenced between that country and Germany. Entirely agreeing with Admiral Ryder that they would be a valuable acquisition to our own Naval Service, and believing that they would prove as comfortable beds to sleep on as those of the ordinary horsehair or wool or other unbuoyant material, we trust that the Lords of the Admiralty will cause experimental trial of them to be made.

On the occasion of the destruction of H.M.S. *Bombay* by fire, near Monte Video, in 1864, referred to by Admiral Ryder, when no less than ninety-one men and boys perished alongside the ship, if each of them had had a hammock with cork mattress within their reach, when forced by the flames to jump into the sea, possibly not a single life would have been lost.

The Naval Hammock—Its Buoyancy and Use in Saving Life at Sea—In Cases of Collision, etc.*

It is well known that the boats of a man-of-war are, as a general rule, insufficient in number and capacity to save her crew except in the smoothest water; also, that the largest and safest are stowed on the booms, from whence time is required to move them to the water—probably not less than ten minutes at sea in the daytime in fine weather—and of course under other circumstances a much longer time.

In a recent instance of wreck from collision, viz., that of Her Majesty's ship *Amazon*, within a few miles of the south coast of England, it was stated that if there had been any swell the boats could not have lived, so close to the water were their gunwales, and it is not probable that there was more than a day's provisions and water in them. Had the collision taken place further from England, say a hundred miles off, probably half the ship's company would have been lost.

In cases of shipwreck, when vessels have sunk or burnt slowly, crews have often in times past been saved on rafts; but men-of-war were then supplied with numerous spare spars, yards, and a large

* A Paper read lately at the Royal United Service Institution, by Rear-Admiral A. P. Ryder.

number of casks, and it was a common topic of discussion among naval officers, "how a raft could be best and quickest made." But no one ever supposed that a raft or rafts for a large ship's company, capacious enough to efficiently supplement the boats, could be properly and securely put together, stored, and provisioned, in less than a few hours; and the most impromptu raft for, say twenty persons, could not, I feel confident, even with rehearsals, have been ready to shove off under a quarter of an hour. Rafts of sufficient size and buoyancy to supplement the boats are now out of the question, and for this reason: viz., that very few spare spars and yards are now supplied, and some of the latter are not unfrequently made of iron. Casks also are much diminished in number since the introduction of the canvas tanks for watering. Our usual resources for saving the lives of whole ships' companies when their vessels are lost, may therefore be said to exist no longer.

I now address myself to one phase, and one phase only of shipwreck, be it loss by collision, fire, capsizing, or filling, etc., viz., that in which help is near at hand; and it is only necessary to float a ship's company for a very limited period (say for thirty minutes or an hour) after their vessel is no longer available for the purpose.

I shall briefly refer to cases of collision, intentional or otherwise. Numerous cases of collision of men-of-war have recently been brought under our notice. I may mention the *Rey d'Italia*, sunk off Lissa in a few minutes: all hands lost. A Russian frigate lost in the Baltic last year, by unintentional running down: several lives lost. An American man-of-war lost in the Eastern Seas—nearly all lives lost: the *Amazon*, already alluded to.

There have been numerous instances in the merchant service of losses by collision. Several were reported in 1869 in the Board of Trade Returns, with much loss of life. In the merchant service, however, except in the case of passenger ships, the boats have generally sufficient capacity to save the crew in moderate weather, if only they can be cleared and lowered in time. If life-belts on the plan of Captain J. R. Ward, R.N., Inspector of Life-boats to the National Life-Boat Institution, were universally supplied in sufficient numbers, and kept handy on board, and if the crew were practised by day and by night in putting them on at short notice, there would have been no need for me to address you on this subject; but as the Admiralty only issue a sufficient number of life-belts for a boat's crew, and as many merchant ships are not supplied with any life-belts at all, I have ventured to recommend a substitute, viz., the ordinary naval hammock, the remarkable buoyancy of which has been often noticed when one of them has accidentally fallen overboard.

In case of shipwreck at night when the men are in their hammocks, the number of lives that could be saved by this means would of course be seriously diminished; but those of us who are familiar with the remarkable quickness with which the men can lash up their hammocks at night when they are suddenly called to "general quarters," would not despair, if the ship did not sink for ten minutes, of many men being saved even by the hammocks they had been sleeping in a few minutes before.

The inestimable value—in case of shipwreck from collision—of the buoyancy to be found in the naval hammock first occurred to me when I was second in command of the Channel Fleet a few months since. We were performing the perhaps useful, but apparently rather hazardous evolution, which consisted in the columns passing through one another, each ship passing at full speed (for the boilers lit) close to her opposite ship. The speed of each ship was about seven knots. The blow, if by some accidental mistake of the helmsman one had struck the other, would have been similar to that given by a vessel going fourteen knots to one at rest, and both vessels would very possibly have sunk in a few minutes, notwithstanding that they were compartmented.

There were numerous ships in company who would of course have steamed to the rescue, lowered their boats, and done their best; but I doubt if so many as half of the 1400 or 1500 men endangered would have been saved. It occurred to me that the hammocks, of which every individual has one (except certain of the officers, viz., those who have cabins), could save them if sufficiently buoyant, and that as their owners knew where they were stowed in the nettings, they were in the most convenient place possible for such a purpose. I have had the buoyancy of a hammock tested, and will give you the result presently. It has much exceeded my anticipations and those of the numerous officers who witnessed the experiments in Malta Harbour.

I hope that other officers on foreign stations will try the same experiments, and allow the men to witness them, and become familiar by practical proof (when bathing), with the buoyancy of their hammocks, and learn that it may be longest retained by not immersing any part of the hammock more than is absolutely necessary, as the water increases its pressure rapidly in proportion to depth below the surface, and finding its way among the hair in the mattress, will soon expel the air and destroy the buoyancy.

The experiments may be usefully extended to show—

1. The maximum weight which a floating hammock, containing no more than a bed and blanket, will support, for say thirty minutes.

2. The various intervals during which a hammock will support weights less than the maximum from one pound upwards—(*a*) in smooth water—(*b*) when water is thrown over the hammock by, or as if by waves.

3. How tightly the hammock should be lashed up to float longest—as it is conceivable that there is a mean degree of tightness, which is preferable—a loosely lashed up hammock might float most buoyantly at first but become saturated soonest.

4. (*a*) How one man could best support himself with one hammock? and (*b*) how two men? whether, in the latter case, they should go to opposite ends of the hammock? or to opposite sides? and (*c*) whether they should, with the object of pressing the hammock down as little as possible consistent with obtaining full support, rest hands or arms on the hammock? (*d*) in the case of two men with two hammocks, would it be best for both men to be between the two hammocks, an arm over each?

5. Whether any material advantage would be derived from the set of hammocks slung for sea being prepared like a fisherman's jacket, viz., soaked in boiled oil, so as to be more impervious to water, or,

6. Whether if the ticking were made of a waterproof material, the hammock would support one man after the hammock and blanket were saturated, and for how long?

7. Whether cocoa-nut fibre would not be lighter than horse-hair, and what are the relative advantages *quâ* buoyancy, and expense of horsehair—cocoa-nut fibre—and cork shavings.

I have included capsizing in the above list of casualties as a case when recourse to the hammocks might be useful, but I refer only to those cases of capsizing when the filling has been a slow process, as will often happen where, in a vessel on her beam ends, only one hatchway or scuttle admits the water.

There is no novelty in my suggestion for utilizing the bedding on board ship for life-saving purposes. It has been suggested frequently that the mattresses and sofa-cushions of passenger-carrying packets should be stuffed with cork shavings, and I believe that the suggestion has been adopted in some cases; but I write under the impression that the buoyancy of the ordinary naval hammock—and the use it may be temporarily put to in cases of shipwreck by collision, etc.—have not yet been sufficiently appreciated.

I have already alluded to the case of a Russian frigate lost last year by collision.

Admiral Boutikof, the distinguished officer who commanded the

Vladimir, in the Crimean war, and who was in command of the Russian fleet in the Baltic at the time of the accident, informed me that he saw the frigate I have already referred to, sunk by accidental ramming in midday in a few minutes, and that many men were drowned, notwithstanding that ships were close to, and the weather was fine; but many were saved by the hammocks. After a few weeks the masts were removed, as they obstructed the navigation, although the hull was in over twenty fathoms water. In removing the masts the hammock cloths were torn, and some of the hammocks floated to the surface, even after so long a submersion. I have lately learnt that the Russian beds are stuffed with cork shavings, and the incident is worth recording. I have learnt also that the Russian Government are known to have ordered a few years since a large number of Messrs. Pellew's patent cork mattresses.

EXTRACT OF LETTER FROM COMMANDER BRIDGE, OF H.M.S. *Caledonia*.

"H.M.S. *Caledonia*, Malta,

"September 10th, 1870.

"DEAR ADMIRAL RYDER,

"Some time since you asked me to try an experiment with a hammock, as to how many men it would float? Until our arrival here this time, I have always been prevented, from one cause or another, from carrying out the experiment. A well lashed up hammock, containing only a bed and a blanket, supported for a few minutes seven naked men, for a considerable time four men, and would, I believe, have continued to do so for nearly an hour. Its power of supporting small weights evidently seemed to be limited by its own power of floating itself, which it would have continued to do, I should say, for considerably over an hour.

"The officers who witnessed the experiments, were, with myself, astonished at the floating powers of the hammock.

"I ought to mention that the hammock itself was a new one, and consequently was rather less pervious to water than an older one would have been, but that probably did not add greatly to its floating capabilities, though of course it did to some extent.

"Your, etc.,

"CYPRIAN BRIDGE,

"*Commander, R.N.*"

Captain Arthur Wilmshurst, commanding H.M.S. *Valiant*, has kindly made further experiments at my request. The most trying test to which the buoyancy of the ordinary hammock can be exposed, appears to be that of suspending a weight at one end, so

that the hammock is brought upright in the water. If the hammock itself and the ticking are pervious to the water, the water, aided by the increased pressure on the portion of the hammock a considerable distance below the surface, soon finds its way in, and gradually destroys the buoyancy by forcing the air out; a weight of six pounds of iron so suspended sunk a hammock in five minutes.

The weight of water displaced by the hammock was estimated at	138·24 lbs.
The weight of the hammock, viz., bed and blanket, when dry	24·5 lbs.
Buoyancy of hammock at first	113·74 lbs.
The length of hammock..	55·5 inches.
Diameter of ditto	9·25 ,,
Volume of ditto	2·16 cub. feet.

If an equal weight, viz., 6 lbs., were suspended at the middle of the hammock, the latter would float much longer. The result of further experiments made by Captain Wilmshurst has been, that the ordinary hammock floating horizontally will support 6 lbs. of iron for nine minutes. The effect of oiling the bed-cover or ticking, was that the hammock floated the 6 lbs. weight for 2½ hours, and would, no doubt, have supported a man for nearly as long. It is hardly necessary for me to state that the buoyancy requisite to support a man in the water who remains quite self-possessed, does not exceed a few lbs.; but it would be well to aim at providing for each man a buoyancy of 20 lbs., and if the hammock is to support two men easily and continuously, then 40 lbs.

I have ascertained that the horsehair bed supplied to the seamen of the Royal Navy is charged to them at ten shillings and sixpence; that beds stuffed with cork shavings can be supplied wholesale (by the Messrs. Birt, who make the well known Cork Life Belts for the Admiralty) at five shillings each, and that with cocoa-nut fibre they would cost about seven shillings and sixpence, and would not have so much buoyancy, but they might be more comfortable.

A mattress of the following dimensions, viz., 6 ft. × 4 ft. × 4 inches, weighs 20 lbs. if stuffed with cork shavings. Its buoyancy, which in the case of cork shavings is four times its weight in pounds, is said to be 80 lbs., *i.e.*, it will support an iron weight of that amount. The mattress on the table has a buoyancy of 26 lbs.

The valuable buoyancy that exists even in an ordinary Naval hammock is, I think, established by the experiments above referred to. The increased buoyancy that can be given to it by various

means, viz., by making the hammock or the tick impervious, or by substituting cocoa-nut fibre or cork shavings for horsehair, have been pointed out, and the question may now, I think, be safely left in the hands of the Naval authorities, who have an opportunity of practising economy and promoting efficiency at the same time. The mattress stuffed with cork shavings is less than half the cost of the hair mattress now supplied, viz., only five shillings. The reason why the cork shaving mattresses are so cheap is that the shavings are refuse, and would otherwise be burnt.

I may add that I have been informed since these experiments were tried for me at Malta, that an officer of rank, who was in Her Majesty's ship *Bombay*, when she was burnt off Monte Video, has stated that if it had occurred to them to stand by hammocks before the men jumped overboard, all hands might have been saved. It will be remembered that a considerable part of the ship's company, including nearly all the marines, and a great many boys, were drowned alongside, while the boats were floating in safety, but deeply overladen with men, a short distance off. The boom-boats could not be hoisted out, as the falls were burnt, and there was not time to make a raft, all hands being employed until the last instant in vain attempts to put out the fire.

YACHTING.

Obliged by "the exigencies of the press" to cut short our last month's *resumé* of the doings of the yachting world, we have now, so to speak, to deal with an unusually heavy cargo of "intelligence"—one that it will puzzle us to stow away within the limits assigned us by the Editor of the *Nautical*. However, we must make the attempt. Upon one of the latter days of July the Royal Yorkshire Yacht Club Regatta took place, the Humber being the scene of action. The first day was devoted to sailing for the "open" prize given by the Club. There was a capital entry of a dozen yachts, and only one of these was absent from the station when the gun signalled the start. Lest we devote too much time and space to the affair, let us say briefly, that Mr. J. V. Maclein's cutter *Aura*, 42 tons, passed the winning post first, but on the time allowance, Mr. W. R. Garthorne's cutter *Madcap*, 20 tons, won, the famous little *Fairlie* taking second prize. We rather think that this was

the first victory of the *Madcap*. She was built by Messrs. Hatcher, of Southampton, and launched on the 27th of June. The Corinthian match which was sailed on the second day of this Regatta was won by Captain Cator's cutter *Ivy*, 18 tons. The weather played Marplot with the season's wind-up of the Royal Alfred Club, and greatly reduced in interest an otherwise highly attractive *rèunion*. Let us summarize the results. The first event was the match for the new third-class champion prize (to be held one year). It was won by Mr. C. H. Coddington's 20-ton cutter, *Lizzie*. The fourth-class champion prize was carried off, after a series of disasters had befallen one and another of the three competitors, by Mr. J. G. W. Griffith's 15-ton cutter, *Glide*. The fifth-class was won by Mr. E. H. Smyth's 6-ton cutter, *Nikomi*. Of course the interest of the race centred in the first-class match, which was reserved to the last. It was wonderful how the *Egeria* and *Enid*, the only yachts of the ten entered, that ventured to leave harbour, managed to live in the gale and sea which prevailed. The *Egeria* was smartest at start and got away with a good lead: but it proved a case of "more haste the less speed" with Mr. Mulholland's gallant schooner. When she was gybing round the flagship moored off the South Bar Buoy, the sudden "chuck" of the mainmast snapped the iron band which was round the boom, and the spar tore away to leeward until it came against the main-rigging and snapped. Eventually, to make a long story of dispiriting disasters short, the *Enid* succeeded in doggedly winning through the tempest and secured both the champion cup (which she won last year) and that given by the Duke of Edinburgh. We should be wanting in gallantry were we to omit mention of one remarkable circumstance in connection with the brave exploit of the *Enid*. The weather, as we have suggested—for it is beyond brief description—was "coarse" enough to have daunted the heart of the stoutest yachtsman, but nevertheless the "ship's company" included the Misses Putman who stood the voyage in a manner that speaks volumes for their valour and endurance.

The Royal Irish Yacht Club Regatta was a most brilliant affair. For the Queen's Cup, a match sailed over a course that roughly speaking measured about forty-two miles, there were seven entries, exclusive of the *Alcyone* which held back after having been nominated, for a race in another class. Some of the finest yachts afloat were comprised in this *septette*, which, a real relief, did *not* include the notorious *Livonia*. One is glad now and then to escape harping upon conspicuous Mr. Ashbury. The day on the whole proved as disappointingly calm as that on which the *Enid* had fought through

her perilous voyage was unpleasantly rough. The five that were together at the finish, weathered the mark in this order—*Oimara*, *Garrion*, *Egeria*, *Vanguard*, and *Enid*, and Mr. W. Turner's *Vanguard* won by time. It was pretty well a "reaching" match, from first to last, and devoid of all save minor points of interest. Mr. Turner is to be congratulated on the result of this match, nevertheless. It would in some sort console him for his loss of the prize he sailed for at the Royal Northern Yacht Club Regatta—a prize gained, it struck us at the time, by the victor's non-observance of a well-understood rule of the road. The £40 prize for yachts of 40 tons and under, attracted seven speedy vessels to the station, including the flying *Foxhound*. A start was made at eleven o'clock, and the two leading yachts finished thus: *Alcyone*, 3 h. 35 m. 27 s., and *Foxhound*, 3 h. 37 m. 11 s., whereby the Marquis of Ailsa won on the time allowance, there being five tons difference between the Scotchman and the leading yacht. The *Lizzie* won the £20 prize. On the second day when the weather was dreadfully unpleasant, heavy rains and scarcely any wind, the £60 match was sailed by the *Oimara* and *Garrion*, and the latter won an unsatisfactory contest easily by time. The £50 prize was won by the *Vanguard*, beating her only opponent, the *Enid*, without any difficulty; while the *Foxhound* carried off the £35 prize for yachts under 40 tons. The £20 and £12 prizes for yachts of 15 tons and under, and 10 tons and under, were respectively carried off by Mr. G. Murney's *Ripple*, 12 tons, and Mr. Alex. Richardson's *Naiad*, 10 tons.

The Royal Cork Yacht Club, which, by the way, devotes its attention to a pack of harriers in the winter, and is we believe the oldest yacht club in existence, dating as far back as 1720, held its annual regatta immediately after the more important one which took place at Kingstown. The weather was simply wretched for sight-seeing, and anything but what it should have been for sailing purposes. On the first day the £30 match for yachts not exceeding 20 tons, a time race, was sailed by the *Shadow*, 20 tons, Mr. D. M'Iver, *Kilmeny*, 30 tons, Mr. P. S. French, and the *Foxhound;* when the last-named of the trio won as she pleased with time in hand, having led all the way. Two yachts only started for the £60 prize, the *Enid* and the *Xema* cutter, 34 tons, Mr. W. H. S. Crawford, and the former added another victory—an easy one—to her list of Irish successes. The *Queen*, 15 tons, Mr. W. R. Johnson, won the £10 prize given for yachts of that tonnage and under, with ridiculous facility. On the second day of the Regatta the *Queen* was beaten in a similar match on the time allowance (notwithstanding a protest made by the owner) by the *Mamie*, 23 tons, Mr. H. H.

O'Bryen. We ought to add that the prize was £20 for yachts not exceeding 25 tons. Mr. Johnson protested that the *Mamie* in rounding the Bar Rock the second time, had fouled it. The principal match of the Regatta, £80, open to all, brought the *Oimara*, *Garrion*, *Enid*, and the *Foxhound* to the station. It was an interesting race, chiefly in respect of the clever handling of the *Garrion* and *Enid*—for the *Oimara* lost her chance before the first round was completed by a series of untoward accidents—and at the finish the *Enid* (second past the mark-boat) won on the time allowance by 45 seconds only.

On Tuesday, the 25th of July, the Royal Southern Yacht Club Regatta came off and proved fairly successful. The cup presented by the Commodore, Sir Bruce Chichester, was contested for by the *Alcyone*, *Niobe*, *Rosebud*, *Tartar*, *Volante*, and *Wildfire*. It was a time race, and the course was from the station vessel round the Brambles, leaving the Bramble Buoys on the starboard hand, outside the Spit and Black Jack and back to the station vessel, twice round; about 40 miles. The *Volante*, *Alcyone*, and *Niobe* were one, two, three, the greater part of the voyage—all the latter part in fact, and the leading vessel would have obtained the prize, had not Sir William Topham, the owner of the *Alcyone*, and Mr. A. Heyman, the owner of the *Niobe*, felt it incumbent upon them to protest. Sir William Topham protested on the ground of an unfair advantage having been obtained by the *Volante* at starting, and Mr. Heyman on the ground of that vessel's having contravened the conditions by leaving the North-east Bramble Buoy on the port hand. The sailing committee at first decided in favour of the *Volante*, but on a re-consideration of the matter the cup was given to the *Alcyone*. We commend the conscientiousness of this sailing committee to the notice of North British Clubs. It is unquestionably better to re-open a doubtful case, after a decision has been given, although the circumstance may bear a construction unfavourable to the sagacity of the adjudicators, than it is to fence round an obviously unjust decision with frigid reticence. The hasty decisions of sailing committees are not seldom at variance with the opinions of yachtsmen of undoubted honour and lengthened experience. The cup presented by the Vice-Commodore of the Club (Mr. F. P. Delmé-Radcliffe) for yachts under 30 tons, was won by Mr. E. Langtree's 15-ton cutter *Ildegonda*.

With the festive features of what may be termed the great "aquatic" event of the year—to quote the sporting papers—or rather group of events, our limited space will unfortunately not permit us to deal. Otherwise the varied attractions, as a fashionable

rèunion, of the Royal Yacht Squadron Regatta would afford a fit peg whereon to hang some pleasant reminiscences. Our narrative, alas, must resolve into the barest possible recapitulation of the matches which were sailed at Cowes under the auspices of the Royal Yacht Squadron. For Her Majesty's Cup there was a really noble entry—comprising the most magnificent specimens of the craft afloat. Colonel Markham's schooner, 105 tons, and Colonel Lloyd's yawl, 89 tons, about which most successful examples of what Ratsey has recently done in the shape of yacht building, rumour was eloquent, were among the entries. The little *Foxhound*, too, was in the list, and Mr. Thomas Brassey's 40-ton cutter, the *Muriel*, which formerly belonged to Mr. H. Bridson. The new conditions affecting previous winners of Queen's Cups, which on this occasion had the effect of handicapping the *Egeria* and *Aline* out of the race, met with no favour at the hands of the public, however much it may have been approved by the owners of non-winners of such Cups. The *Egeria*, having won the Queen's Cup at Cowes in August, 1869, was put back, that is to say, weighted ten minutes, and the *Aline*, which won the same Cup in 1867, five minutes beyond her time allowance. For winning the Queen's Cup in 1859, the *Aline* was not penalized. According to these most arbitrary conditions, a penalty is involved if the prize has been won within the last ten years. We hope to see these absurd restrictions removed before another Royal Squadron Regatta comes round. It was an unfavourable day for yachting, there being no wind to speak of, and in consequence the match can in nowise be regarded as a satisfactory test of the merits of the yachts that contested, especially as after all, the prize was not awarded on the first attempt. It was fixed that the match should be closed at 10.30, and it was fully an hour after that when the *Guinevere* arrived in Cowes Roads. On the second day matters slightly improved, and there was reasonable prospect of the cutter match being sailed through satisfactorily. A fine fleet, the cream of the cutters afloat, appeared at the station to await the signal, and after an uneventful cruise, "public form was vindicated," as they say with regard to another English sport, by the *Vanguard* winning the first prize on the time allowance, and the *Foxhound* the second. Thanks to a continued prevalence of light winds, if winds they could be called, on the third day the *Vanguard* easily won the Town Cup on the time allowance from the *Oimara*—which was first past the mark-boat—and a big fleet of well-known yachts. This is the order in which they passed at the finish:—*Oimara*, *Vanguard*, *Garrion*, *Guinevere*, *Livonia*, and *Aline*. The *Livonia* raised renewed hopes of her future by the manner in which she

behaved during this match. They will make something of her yet. Alterations had been made in her which may be pronounced improvements. The chief of these are the addition of a lead keel from her stern post to nearly a foot of her foremast; her stern has also been cut away a trifle, and she had a longer bowsprit than before, while the main boom was shortened to reduce the weather helm she previously carried.

Clogged with conditions of a gratuitously obnoxious character, the contest for the Prince of Wales's challenge cup becomes more unpopular every year it is sailed, and it is a pity that the illustrious donor of the trophy is not made aware of the drawback, together with its easily remediable cause. To secure the cup a yacht must perform the almost impossible feat of winning it three years in succession; we may therefore confidently predict a long lease of a place in the annual programme of the Royal Yacht Society Regatta for this unhappy piece of plate, unless an understanding is come to amongst yachtsmen, and, by the exercise of a pious fraud, the absurd conditions which attach to the cup are at length complied with. It is honour or nothing in a race for the temporary loan of the cup. An eminent yachting authority, indeed, suggests that the plate be turned into a perpetual challenge cup and a £50 prize added by the Squadron. We heartily applaud the notion. Well, with regard to the race on the 4th instant. The "probable starters" (to borrow a phrase from another sport patronized by Neptune) were the *Egeria*, which won the cup last year, *Aline*, and *Livonia*. Unfortunately the *Egeria* was not ready when the first gun was fired, and as the sailing committee refused Mr. Mulholland the quarter of an hour or so's grace which he asked, the match became literally one between the *Livonia* and *Aline*. In a strong steady wind from N.W. by W., a start was effected at 1 p.m. The course from the Castle, Cowes, round the Shambles Light off Portland, thence round the back of the Isle of Wight, past the Nab to Cowes; and this the two yachts accomplished, the match throughout having afforded the most searching test of the *Livonia's* qualities thus:—*Aline*, 1 h. 45 min., *Livonia*, 1 h. 46 min. 30 sec.—a marvellously close result, when the length of the voyage, about one hundred and fifty miles, is taken into consideration.

Since so much interest attaches to Mr. Ashbury's schooner, and the contest in question brought out her bad and good qualities more conspicuously than any match in which she has been engaged, we make no excuse for quoting the following able verdict of the yachting editor of the *Field*, an authority on the subject in every sense of the word:—"The *Aline* incontestably determined herself

the better vessel; but, as the *Livonia* made such an exceedingly close match with her, she in turn proved herself to be a vessel of the very first class. She certainly ought to have beaten the *Aline* easily, and, had she been as good and fast as many good judges expected her to be, that feat would have been accomplished. But the *Livonia*, so far as these 'great expectations' are concerned, it must be confessed, is a failure. She has now had a fair trial with a known good vessel, in as strong and steady a wind as could be desired or obtained, and has met with defeat; still, the defeat is not such as to utterly condemn the yacht, and had any other vessel made such a close fight with the *Aline*—said, be it remembered, to be much improved this year—she would have been pronounced one of the best schooners afloat. But the *Livonia* was heralded upon the seas with such sanguine and glowing anticipations that any defeat she might suffer where she was expected to conquer was certain to be looked upon and spoken of as an overwhelming proof of her being a failure. We are not apologising for the *Livonia*, and confess that we have been as much deceived by her sailing as anyone. She undoubtedly did better on the day of her first trial than she has done since, but probably even on that day sufficient allowance was not made for the reduced canvas the *Guinevere* was sailing under. Of course it could be seen then that she was wanting in speed and stability, and nothing that can be done to her by putting lead on her keel or reducing her spars will give her the power she is in need of. It can plainly be seen now wherein the mistake lies. An attempt was made by her builder to combine the shallow and beamy type of vessel with the narrow and deep type of large displacement; the result proves that the *Livonia* carries too little ballast, or, in other words, is too shallow for her beam. Now it has been suggested that there are two ways of correcting this defect; she could either be given more beam by 'hipping' on the water-line to increase her stability, or her displacement could be increased. The latter plan seems to recommend itself the more forcibly, as she undoubtedly requires weight to carry her through a seaway, and by hipping—say one foot—her tonnage would be so enormously increased that her chances of winning cups then would be as remote as they are at present. By increasing her displacement she would lose a great deal of the extreme hollow she has to her floor, and would have a bottom much more suitable to the seas around our coast than the one she would get by increased surface after hipping. By filling out her bottom she would of course acquire additional room to stow ballast, and this extra ballast being stowed low would give her the stability and power she at

present is deficient in. We have ventured to offer these opinions on the vessel because we believe them to be sound ones, and because a general idea prevails that all her defects arise from her being over-sparred. No doubt she is over-sparred as she at present is, and by cutting her sticks down she would, almost as a matter of certainty, be improved for sailing in a strong breeze; but she has not an inch too much canvas to carry in light winds, and even then she fails when everyone expected she would go skimming along faster than any yacht afloat. At present she is a puzzle, about the unravelling of which many opinions have been offered, and we sincerely wish that some one could hit upon the right one."

On Monday, the 7th, the deferred match for the Queen's Cup was sailed, and won by the little *Foxhound* which arrived at the end of her voyage about an hour before the second yacht—Lord Henry Lennox's yawl the *Hirondelle*. So terminated one of the most successful yacht squadron weeks ever held.

The Regatta of the Royal Victoria Yacht Club was got through as satisfactorily as the prevalence of provoking calms would permit. The briefest of brief summaries must suffice to tell the story. The race for the Vice-Commodore's Plate began at 9 a.m. and finished at sunrise next morning, when the three "left in it" finished thus: *Livonia*, 4 h. 15 min., *Egeria*, 4 h. 15 min. 30 sec., *Guinevere*, 4 h. 17m. The length of the course was about 60 miles. The race for yawls was won by the *Hirondelle;* and the Commodore's Cup, for cutters and yawls, began on Thursday and concluded next morning, fell to the share of Mr. W. F. Stutfield's 76-ton cutter, the *Menai*. The Town Cup, sailed for on the Friday—or drifted for—was won by Major Thorp's 65-ton yawl the *Gertrude*, Mr. Houldsworth's cutter, 98-tons, saving her time and thereby taking the club prize of £40.

Drifting, pretty nearly nothing but drifting was the order of the day at the Regatta of the Royal Albert Yacht Club. On the Monday, the Corinthian match for yachts of 15 tons and under was won by the *Fairlie*, and the Club Cup, for yachts that had never won a prize, by Mr. A. Snook's 38-ton yawl, the *Bella Donna*. On Tuesday, the *Flying Cloud* (Count Battyhány's) beat the *Egeria* in the schooner match—beat her on the time allowance; and the *Alcyone*, the Rear-Commodore's prize. The *Vanguard* won the Albert Cup, and the *Menai* the second prize in the match on Thursday; whilst the Vice-Commodore's Cup became the property of Mr. E. Langtree through the *Ildegonda*. The *Fairlie* was first home, but having cast to starboard instead of to port on slipping her anchor, and thereby disobeying the sailing instructions, she was disqualified.

The wind-up of the Cheshire Yacht Club's season took place on the 12th, when a Corinthian match was sailed, and the fleet little *Brenda*, 9 tons, Mr. F. Thompson, won, the *Naiad*, 10 tons, Mr. J. Richardson, finishing second. This was in the first-class match. The second-class prize was won by Mr. S. M. Bully's *Florida*, 5 tons. Yachting news of a miscellaneous character is very scant this month; but we should not have space to deal with it if there were an abundance.

THE RECENT NAVAL DISASTERS.

THE STRANDING OF THE AGINCOURT.—The remark in our last number as to how this ship came to be within a mile of the well-known Pearl Rock, seems to have been borne out by the results of the subsequent court-martial. The Court appears to have been as equally astonished as ourselves how a ship of 6000 tons, under steam, should have been anywhere near where she was;—and by their significant expression, "considering the attending circumstances under which the *Agincourt* was then being navigated," seem to lay the principal blame on those "attending circumstances." We congratulate Captain Beamish and Staff-Commander Knight on the view the Court took of the matter, for we know that by repute, both are good officers and worthy men. But the Admiralty have not lost sight of these "attending circumstances;" their Lordships have caused them to be investigated, and the result has been to identify them with the course of the Flag-ship of the Commander-in-Chief. It seems to have been nothing more than blindly trusting to the course of the *Minotaur* which caused the stranding of the *Agincourt*.

To any one acquainted with the usages of the service, the question put to most of the witnesses as to whether, with the knowledge or opinion that the ship was too close in they did not consider they ought to have made the same known, must appear ridiculous. Fancy a sub-lieutenant, or even a lieutenant, giving his opinion! Even the navigating officer of the ship in the wake of the *Agincourt*, who *knew* that he was steering into danger, dared not venture to report the same, but believed the ship ahead was equally aware of *her* danger; and even had he done so, and the *Agincourt* had suddenly starboarded her helm and cleared the danger, would he have been thanked and promoted for his timely interference or

what? The truth is there was no one to "bell the cat," *i.e.*, admonish the Admiral in command that he was leading his fleet into danger.

We believe that the impression is, or was, very general, that admirals had no responsibility in the actual navigation of the ship; the decision of the Board will therefore seem to be especially severe on those officers; but that the sentence of the court-martial as it stood would have been a miscarriage of justice, we cannot but believe; and however much we may regret—and we do regret—the decision of their Lordships as it personally affects those to whom it relates, we are convinced that for the well being of the service and the safety of Her Majesty's ships, the example will be most salutary. The following is the text of their Lordships' circular.

"The Lords Commissioners of the Admiralty have had under their consideration the circumstances in which Her Majesty's ship *Agincourt* was stranded on the Pearl Rock, while proceeding with the squadron out of Gibraltar Bay on the 1st July last.

"2. The court-martial which was recently held upon three officers of the *Agincourt*—Captain Beamish, Lieutenant Bell, and Staff-Commander Knight—on a charge of having negligently stranded the ship, has pronounced that the charge was in each case proved; but, considering the attending circumstances under which the *Agincourt* was then being navigated, the Court only adjudged Captain Beamish and Staff-Commander Knight to be severely reprimanded and admonished to be more careful in future, and adjudged Lieutenant Bell to be admonished to be more careful in future.

"3. The evidence adduced at the trial was extensive and complete. Among other witnesses examined were Vice-Admiral Wellesley, who commanded the squadron in which the *Agincourt* was sailing, and who led the port division in the *Minotaur;* Rear-Admiral Wilmot, who was on board the *Agincourt*, leading the starboard division; Captain Wells and Staff-Commander Kiddle, of the *Minotaur;* Captain Glyn and Staff-Commander May, of the *Warrior*, and many others. The perusal of the evidence satisfies their lordships that all the material facts connected with the stranding of the *Agincourt* were fully brought out, and that no further inquiry is necessary. They have, therefore, after careful deliberation, framed their final conclusions upon the whole case.

"4. The general result at which their lordships have arrived is, that the stranding of the ship was occasioned by great negligence, in which other officers besides those who have been tried were concerned.

"5. Their lordships are of opinion that the primary cause of the disaster was clearly the unsafe course steered by the squadron in obedience to signal from the flag-ship. It appears that Vice-Admiral Wellesley, on leaving Gibraltar, conducted the squadron under his command so close to the western shore of the bay that, with the weather fine and clear and the wind light, the leading ship of the inshore division struck on the Pearl Rock, and was in imminent danger of being wrecked.

"6. Their lordships cannot but feel that due care was not exercised by the vice-admiral in command to insure that a safe course should be steered by his squadron, and they greatly regret that, with such large and valuable ships in his charge, he did not satisfy himself by examination of the course proposed, and by seeing them laid off on the chart, that the squadron would be taken a safe distance from a well-known and dangerous shoal.

"Vice-Admiral Wellesley is a distinguished officer, who has rendered to his country good and faithful service: he has always enjoyed their lordships' entire confidence; and their lordships do not fail to remember that it was at their express request that he relinquished the command of the North American and West Indian station and assumed that of the Channel Squadron in October last. It is, therefore, with extreme regret that, in the performance of their duty, and with a view to impress upon all officers in command the necessity for the utmost vigilance and unremitting attention to the navigation of the ships entrusted to their care, their lordships are constrained to mark their sense of his grave default on this occasion by directing him to strike his flag.

"7. Their lordships also recognise the former good service of Rear-Admiral Wilmot, but they must express their disapproval of his conduct on this occasion. A rear-admiral commanding a division in such circumstances was not merely responsible for maintaining the positions of the ships of his division with relation to the flag-ship of his commander-in-chief; it was his duty to have also informed himself of their position with reference to any danger in their course, and to have exercised a watchful care to keep them clear of such danger. Had Rear-Admiral Wilmot paid more attention to the navigation of the ships under his immediate orders he would not have suffered his flag-ship leading the starboard division to run on shore on a well-known shoal in broad daylight, when the land and the marks for clearing the shoal were distinctly visible.

"Their lordships have, with much regret, arrived at the conclusion that they must supersede Rear-Admiral Wilmot from his command.

"8. The superseding of Vice-Admiral Wellesley and Rear-Admiral Wilmot will involve that of the captains of the ships in which they carried their flags. The conduct of Captain Beamish has already been subjected to investigation by a court-martial, and their lordships therefore refrain from comment upon it.

"As regards Captain Wells, it is necessary to point out that he failed to make himself correctly acquainted with the real position of the ship under his command with reference to the dangerous shoal the squadron were passing. He approved and submitted to the vice-admiral, a course which he ought to have known would inevitably lead the starboard division into dangerous proximity to the Pearl Rock.

"9. The error committed by Staff-Commander Kiddle, the senior navigating officer of the flag-ship, in advising a course which was highly dangerous, can hardly be overrated. To this error primarily may be attributed the grounding of the *Agincourt*. Staff-Commander Kiddle has hitherto borne the character of a careful navigating officer, but after this event their lordships can no longer consider it safe to leave the pilotage of the Channel squadron in his hands, and he will be placed upon half-pay.

"10. Upon the conduct of Staff-Commander Knight, their lordships do not offer any observation, as it has been dealt with by the court-martial.

"11. Their lordships have had under their consideration the evidence given by the officers of the *Warrior* and *Northumberland*, the ships astern of the *Agincourt*. Their lordships are of opinion that steps should have been taken by the captains and navigating officers of those ships to apprise the *Agincourt* of the immediate danger into which she was standing.

"12. Having thus performed the painful task of commenting on the want of care which led to the grave disaster, and of conveying to such officers responsible for its occurrence, as were not dealt with by the court-martial, the censure it calls for, their lordships are glad to turn to the pleasing duty of expressing their approbation of the exertions made by the officers and men of the squadron in lightening the *Agincourt*, and in rescuing her from her perilous position, and they expressly notice the skill exhibited by Captain Lord Gilford in rendering the assistance of the *Hercules*, as described in a dispatch from Vice-Admiral Wellesley."

Loss of the Megæra.—The loss of H.M.S. *Megæra* is now an old tale, although the particulars are not known. The amount of the intelligence we have received is, that on the 8th June, when in the

Indian Ocean on her passage from the Cape of Good Hope to Sydney she sprung a leak, which increased so rapidly, that steam had to be used to keep her free; and not having on board sufficient coal to reach Australia, the captain decided to make for St. Paul's Island. We may add, parenthetically, that fortunately the ship was provided with an excellent large scale chart of the island, which enabled the captain to see at once that on reaching the island, there was at least safety of life assured. On the 17th, the *Megæra* reached the very indifferent anchorage on the east side of that island, and a survey on the ship was held, the result of which was, that it was unsafe to proceed; that decided, there was but one thing left to do and that was done, viz., to provide for the sustenance and safety of the crews by landing all that could be landed and then run the ship on shore. This latter proceeding was necessitated by the loss of anchors, so that as far as we know of the conduct of captain, officers, and men, all was done that could be under the circumstances, and the blame, if any, will not attach to them.

There have been exceptional circumstances in relation to the *Megæra* which may fairly be commented on previous to the court-martial on the captain and officers for the loss of the vessel, or the inquiry that is promised by the First Lord of the Admiralty.

We well remember the astonishment felt in Naval circles when the "*Old Megæra*" (as she was emphatically called) was ordered for foreign service. We knew her first as a troopship and then as a vessel under the command of a Staff-commander, employed conveying stores and provisions on short voyages, and whether from custom or a knowledge of her capabilities and condition, probably both, she was looked upon generally as fit for nothing else. When the order was made known that the old store-ship was to be employed to take out two crews to Australia as we stated, it created great astonishment; and more, so prevalent was the belief that she was unfitted for the work that it became a subject of question in the House of Commons.

Whatever the general run of parliamentary questions may be there is no doubt that this one concerning the state of the *Megæra* was not without good foundation; but, as is too often the case, where party spirit prevails and the actions of a department are called into question, they are made and met in the spirit of party and not in respect of their fitness and justness; and thus when the exponents of the department attacked have a doubt thrown on their proceedings or acts, they consider themselves bound to hold they are right, and are the more obstinately determined to adhere to their course of action. In the case of the *Megæra* there may have been depart-

mental obstinacy, simply because the very order for the ship to be prepared for the service intended reflected on them, and to countermand the order would have been to own they were wrong.

The next part of the question we have to deal with is, in our opinion, of a far more serious nature, and we allude to the remonstrance offered by the officers previous to starting. It is only the second time in our memory, that officers have attempted to offer a remonstrance against going where they are ordered, and in whatever ship they are ordered. True, an officer may decline an appointment under certain circumstances; but to object in any manner to proceed to sea when the appointment is made, is so contrary to our ideas of discipline that it sounds more like mutinous conduct, and to admit such a thing to be right and proper would be most detrimental to the welfare and discipline of the service. The extraordinary step taken by the remonstrants, we are confident nothing but the gravest necessity would have induced them to take. Had their remonstrance not been based on sound facts, no punishment would have been too severe and instant dismissal or supersession mild; but as no one, to our knowledge, was even admonished for the part he took in the matter, it would seem as though there were some reason for their complaint; and although the remonstrance did not refer to what was not evident to their senses, viz., the thickness of the plates in the ship's bottom, still if it only referred to the upper works, and those upper works were found faulty, it was natural to suppose that if those were passed by the Dockyard officials as perfect or fit for service, the ship herself *might* be found equally faulty and would necessitate another examination.

The last consideration is, on whom is the onus or responsibility to rest, provided the captain and officers are held blameless? the public in these days will not rest satisfied with mere shifting the responsibility from one shoulder to another until it becomes so blended that no one can settle it on the right man. The Board of Admiralty itself has just settled in a most decided way that responsibility must rest on some one, and in anticipation that the sentence of the court-martial on the stranding of the *Agincourt* would not satisfy the public and the considerations of justice, two admirals, two captains, and two staff-commanders are placed on half-pay as an example and warning to others, and, we would ask, is not the same justice to be meted to those who, either through misrepresentation, or negligently performing the duties imposed on them, not only risk and hazard the loss of one of Her Majesty's ships, but recklessly risk the invaluable lives of nearly 400 officers and men?

We are not so unwise as to attribute the blame to Admiral this or Admiral that, but we may come close home when we ask the question, who reported the upper works, in the matter of the ports, bolts, and screws, complained of and found faulty in the *Megæra*, as fit for the wear and tear of a long sea voyage? If they were so reported the person who did it is culpable; if they *were* reported faulty, the person who took upon himself to reject that report is culpable; and the same with regard to the state of the ship's bottom. Again, if after all the reports had been made, and the estimates for necessary repairs submitted, they were cut down for the purpose of saving a few hundreds of pounds, we do not envy the feelings of any who had a hand in it.

"Where there is a will there is a way," and if the promised inquiry is intended to bring the responsibility home to the right quarters, we believe it *can be done*, and we only ask the same measure of justice to be meted to those with whom the fault lies, as to the, now, late officers of the *Minotaur* and *Agincourt*.

NEW BOOKS.

Lighthouse Illumination—A Description of the Holophotal System, etc. By Thomas Stevenson, F.R.S.E., M.I.C.E. Second Edition. Edinburgh: Adam and Charles Black. 1871.

As the first edition of this treatise (which appeared in 1859) is probably already well known to those readers of the *Nautical Magazine* who take an interest in the scientific features of lighthouse illumination, it may suffice if we here note the chief points of difference between the present and the earlier work.

Owing to the more extensive application, within the last few years, of electricity to purposes of lighthouse illumination, Mr. Stevenson has devoted a special chapter to the consideration of this subject. After a brief description of the machinery necessary for the production of the light, he proceeds to the discussion of the important questions, (1.) "Whether, and to what extent, the electric light ought to be adopted?" (2.) "What kind of apparatus and power of machinery should be used?" And here our author issues a timely caution to us not to be led away by the mere glare and splendour of the electric light: *distinct visibility* is all that is requisite for the purposes of the mariner.

Anything more or less than this is a positive evil. "The really useful power," says Mr. Stevenson, "is that of penetration through an obstructing medium;" and estimated by this standard, it seems doubtful whether the electric light can claim any vast superiority over the oil lamp; though this is a question which, according to our author, "demands more extended and accurate observations." Nor does he fail to note, among the weak points of the light in question, its inconstancy and flickering: a failing due, partly to imperfections in the quality of the carbons, partly to want of compensative action in the mechanism of the lamp, and also, largely, to variation in the positions of the carbon points, which of necessity entails frequent ex-focal positions of the flame.

He also deprecates the employment of too small a size of optical apparatus for this light: first, from the extreme care and accuracy necessary in the grinding of the surfaces and fitting of the glass work, when used for this purpose: and, secondly, from the fact that any slight deviations from exact focussing will, with a small apparatus produce greater deflections of the beam of parallel rays. After a scientific investigation of these points, he proceeds to the consideration of the form of lens and prisms most suitable for the electric light.

A chapter on "Proposals for the Illumination of Beacons and Buoys," consists in great part of a pamphlet which issued from Mr. Stevenson's pen, under the above title, about eighteen months ago. It is full of interesting information and valuable suggestions for the application of gas, electricity, and borrowed light; but we can, unfortunately, do no more here than direct attention to it.

Another novel feature in the present edition of the work before us, is a description of a "Holophone, or Sound Reflector for Fog Signals," an ingenious device for condensing, and directing in any given direction, the diverging waves from a sound-radiant. Experiments instituted for testing the comparative efficiency of a naked whistle, and one placed in the focus of a holophone, seemed to point to a decided superiority in the latter, for distances up to about two miles; though, at longer ranges, the advantages of the sound reflector were not, by any means so conspicuous.

In a competitive trial, held at Dungeness, between sound-radiants of various kinds (viz., horns, guns, whistle, and bell), a horn seven feet long showed itself most effective in the production of penetrating noise. The chief objections to the employment of sound as a warning agent seem to be, the difficulty of accurately estimating its

source, and also (at least in the case of whistles) its liability to confusion with signals proceeding from steamers, etc.

The concluding pages of the volume are mainly occupied with a "Description of some new forms of Photometer."

Such then is a meagre sketch of a few of the salient points in the work before us; but it is impossible, in a brief notice like the present, to do anything like justice to the scientific and literary ability (the latter we fear a somewhat rare quality in writers of the engineering profession) therein displayed; and we can only hope that our remarks will incite our readers to form a more intimate acquaintance with the volume, to which we have in these few lines introduced them.

Captain Alston's Seamanship. New Edition. Revised and enlarged by Commander R. H. Harris, R.N., etc., etc. Portsmouth: Griffin and Co. 1871.

A NEW edition of this well-known and most useful work is pretty sure to meet with a good reception from the maritime world. We ourselves have a vivid remembrance of Captain Alston's vigorous and manly advice to those who proposed to follow the sea as a profession, and in this new edition of his book we have reread the introduction with enhanced pleasure. If the work possessed no other merits, it would be of great value on account of the true sailor-like spirit which pervades Captain Alston's introduction. One observation of his seems to us to apply with especial significance to the artificial state of education which obtains to too great an extent in these days. He tells the junior officers of the navy, to whom his work is dedicated, that "until you become ingrained with these principles (*i.e.* principles of a noble and God-fearing manner of life) as your forefathers were, all the seamanship and science that experience and books can bestow will never make a seaman such as they were, of you or of any British lad."

Commander Harris has turned his attention to the revision of the main body of the work, and has done much towards adapting it to modern improvements and requirements. The twelve years which have elapsed since the first edition have seen great changes in matters relating to ships and navigation. Captain Alston, in 1859, "excluded the consideration of steam power, as, owing to the great cost of coal and the impossibility of providing stowage for it except to a limited extent, the application of steam power for ordinary purposes must be strictly auxiliary and subordinate, and its employment on

general service the exception and not the rule;" while Commander Harris, in his preface to the 1871 edition, regards "steam as the motive power, and sail as the useful auxiliary only." To this view this edition is supposed to be modified, but it is scarcely done to the extent we should have expected from the remark of Commander Harris, above quoted. In this age of steam it is highly necessary that every naval officer should possess correct knowledge concerning marine engines, and we rather looked for some comprehensive and explicit information in relation to their working, and for some fuller details as regards seamanship in connection with them. However, as far as it goes, the new matter furnished by Commander Harris is in the right direction, and will, we doubt not, be serviceable for instruction on account of its correctness and clearness.

The Addenda in the shape of the Treatise on Nautical Surveying, by Staff-Commander May, and the Instructions to Officers of the Merchant Service, by Mr. W. H. Rosser, embody a vast amount of information which cannot fail to be of the greatest service to young officers. On the whole, the new edition has very much to recommend it, and we believe that the book will continue to be, as expressed by Commander Harris, one of those "vehicles of instruction to assist officers in obtaining that sound knowledge of their profession which, combined with valour, under God's providence, has made the British navy renowned in the annals of the world."

Captain De Horsey's Pamphlet on the "Rule of the Road."

Any suggestions which tend to lessen the chances of collision at sea will always meet with the earnest attention of the sailors of all nations, especially those who command large steam ships, for their risks are necessarily greater than those of the small steamer or ordinary sailing ship. To attempt, therefore, to lay down dogmatic rules which shall embrace all classes of ships under one head is a dangerous innovation. The swift weatherly vessel will clear a danger by means which a sluggish one would not dare to try, and the compilers of the celebrated regulations of the Board of Trade have evidently borne this in mind, since they only lay down certain general rules for guidance, leaving their details to the correct eye and practised judgment of the officer of the watch, who best knows the capabilities of the ship under his charge.

Captain De Horsey has, however, published a number of supplementary instructions which if adopted would compel the seaman

to abandon his judgment, and substitute in its place a mere mechanical routine. We will, therefore, examine them closely, in order to ascertain why the clipper tea ship, the dull heavy collier, and the Atlantic mail steamer should be classed in the same category.

We shall extract his rules, verbatim, from the pamphlet.

"Under sail only." "Close hauled on port tack."

(1st.) "Take bearing."

(2nd.) Ascertain whether a steamer or not.

(3rd.) If a steamer keep your course.

(4th.) If a sailing vessel

(*a*) If to windward of you keep your course.

(*b*) If ahead of you keep your course.

The above rules would be perfectly in accordance with those of the Board of Trade if all vessels had similar sailing qualities, but it would often occur in practice that a fast weatherly ship, if she carried this rule out, must inevitably come in collision with the more leewardly one. For example, a clipper ship in a strong breeze will sail nine knots per hour on a bowline, and make no perceptible leeway: say she is on the port tack, and a sail is reported ahead. As her true position depends in somewise on the position of the lookout-man, it is possible that she may be half a point on the lee bow. It is discovered, when too late, that the stranger is a light vessel in ballast standing off and on, waiting for daylight. Anyone who is acquainted with this class of vessels will readily agree that 3½ points leeway would not be an excessive quantity under such circumstances. Should a collision occur, the ship on the port tack would be held blameable by the Admiralty Court.

(*c.*) "If to leeward of you or on lee bow."

(1.) "Take bearing again."

(2.) "If her bearing has altered materially and continues so to alter, keep your course."

Now, in the first instance, what does Captain De Horsey mean by the term, to leeward of you. The great majority of seamen would answer, If a ship were two points on the lee bow, we should consider her to be to leeward. A perpendicular on the wind will prove that she would not be to leeward when on that bearing, and here a difference of opinion would at once arise. Where then, in practice, would Captain De Horsey fix the zero point?

(3.) "If her bearing has not altered materially, bear away until it does so."

What, in the Admiralty Court, would be considered the limit of

the term "materially," we know not, and should you attempt to pass on the wrong side, because you deemed the approaching vessel had altered her bearing materially, and a collision ensue, you would incur the responsibility. Whoever attempts to lay down arbitrary rules for such cases, which are at variance with the acknowledged laws of the country, incurs a grave responsibility. It is one's duty to keep these laws continually in view, and to use much discrimination before you infringe them.

When a vessel is seen at night in dangerous proximity, there is no time to study her bearing by compass. In such cases an officer must trust more to his judgment and correct eye, for the advancing ship is frequently obscured by the foots of the courses from the binnacle.

"Going Free." "Under sail only."

(1.) "Take bearing."

(2.) "If her bearing has not altered materially, alter course several points to starboard or port to assist to alter her bearing."

The Board of Trade Regulations on this point are clear and simple, and are contained in sections 12 and 17. When a ship is carrying a heavy press of sail off the wind, it is a serious thing to alter the course "several points," unless the danger is imminent, as it would often bring her by the lee or aback. If this recommendation were carried out in a fleet when running up the English or Irish channels, it would cause a total disarrangement and confusion in the columns.

"Under steam." The same arbitrary rules are laid down in this part for altering course several points, so that the sails in crowded waters would be constantly aback or by the lee. From experience in the command of Atlantic steam ships in the Irish channel and elsewhere, the writer is unable to see the necessity of carrying out the suggestions contained in these rules.

Article 17 of the Board of Trade Regulations seems to be perfectly clear and easy to carry out in practice. For one vessel to overtake another she must have a commanding speed, and it is not reasonable or even possible to make the slow sailor get out of the way of the fast.

The same rule applies when approaching from the beam, no seaman would attempt to cross the bows of another vessel in dangerous proximity, under such circumstances.

MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	PLACE.	SUBJECT.
48	AUSTRALIA—Victoria—Lady Bay—Warrnambool	Alteration in Lights.
49	IRISH CHANNEL—Isle of Man—Point of Ayre ENGLAND—East Coast—Lowestoft	Alteration in Light. Discontinuance of Corton Gatway Lights, etc.
50	GULF OF ST. LAWRENCE—Seven Islands RIVER ST. LAWRENCE—Cape Rouge	Establishment of a Light. Establishment of a Light.
51	JAPAN—Nipon—East Coast	Discovery of a Reef.
52	NEWFOUNDLAND—East Coast—Ferryland head	Establishment of a Light.
53	MEDITERRANEAN—Algeria—Bona	Alteration in Lights.
54	KOREAN ARCHIPELAGO—Between Nimrod and Ripple Islands	Discovery of sunken Rocks.
55	MEDITERRANEAN—Alexandria—Boghaz or Central Pass " —Port Said	Establishment of Beacons. Pilot Signals.
56	IRELAND—Lough Foyle—Inishowen Lights	Alteration in Lights.
57	RIVER ST. LAWRENCE—Red Islet bank	Establishment of a Light-vessel.
58	AFRICA—West Coast—Accra	Establishment of a Light.
59	NEWFOUNDLAND—Cape Ray GULF OF ST. LAWRENCE—Magdalen Islands—Amherst Island	Establishment of a Light. Establishment of a Light.
60	NOVA SCOTIA—North Coast—Pugwash Harbour NEW BRUNSWICK—North Coast—Bathurst Harbour GULF OF ST. LAWRENCE—Gaspé Harbour	Establishment of a Light. Establishment of Beacon Lights. Establishment of a Light-vessel.
61	ENGLAND—Thames River—Princes Channel	Alteration in position of Buoys.
62	BERMUDA—The Narrows and Stag Channel	Alteration of Buoys.
63	JAPAN—Inland Sea—Awadji Island " —Gulf of Oösaka	New light established on Matsu-wo-no-hana. Temporary lights on Wada Misaki Hiogo and Temposan Fort, Oösaka.
64	PACIFIC OCEAN—Fiji Group—Levuka	Establishment of Beacon Lights.
65	ENGLAND—Spithead—Ryde Middle Bank	Alteration in Buoys.

NAUTICAL NOTICES.

(All Bearings are Magnetic.)

48. *Australia—Victoria—Warrnambool.*—The alteration in the lights notified in the March number has been made.

The Upper light is a *fixed white* light 109 feet above the sea, visible from East, round by North, to N.W., should be seen 14 miles.

The Lower light is a *fixed red*, visible from N. $\frac{1}{8}$ E. to N. by W., and should be seen 5 miles.

A *fixed green* light is exhibited from the end of the jetty.

Directions.—Vessels entering Warrnambool harbour from the westward or southward, should first sight the red light (carefully avoiding the 17-foot patch which lies S.S.E. half-a-mile from Middle Island), and then bringing it in line with the white light, bearing North, steer in between the five-fathom bank and the foul ground South-east of the Breakwater rock until the green light on the jetty is opened, when steer in for it and anchor. From the eastward, either bring the marks above described on, or cross the bar to the south-eastward, taking care not to shut the white light in when standing towards the mouth of Hopkins river.

It is not safe to enter or leave the harbour in south-westerly or southerly gales. In bad weather, or with a heavy southerly swell, the sea breaks at the distance of a mile from the land.

49. *Irish Channel—Isle of Man—Point of Ayre.*—The red and white light has been changed from a revolving light every two minutes, to a revolving light *every minute.*

England—East Coast—Lowestoft.—The width of the Corton Gatway channel having decreased, rendering the navigation of it by night unsafe, the Corton High and Low lights have been extinguished.

50. *St. Lawrence Gulf—Seven Islands.*—A light has been established on Carousal island, one of the Seven Islands, on the north shore of the Gulf. The light is a *fixed white* light, 195 feet above the sea, and visible 20 miles in clear weather. Position, lat. 50° 5′ 40″ N., long. 66° 22′ 40″ W.

St. Lawrence River—Cape Rouge.—A *fixed white* light, 175 feet above the sea, has been established on this Cape, it should be seen ten miles. Position, lat. 47° 7′ 20″ N., long. 70° 42′ 45° W.

51. *Japan—Nipon—East Coast.*—A reef of rocks reported by the Russian frigate *Arkold*, and noticed in the "China Pilot," has recently been seen by the Russian gunboat *Sibole.* The reef *(Arkold reef)* on which the sea appeared to break with great force, was estimated to be 20 feet above water. The mean position of the reef is in lat. 36° 10′ N., long. 141° 26′ E.

52.—*Newfoundland—Ferryland Head.*—A *fixed white* light 200 feet above the sea, and visible 16 miles, has been established on this headland, in lat. 47° 0′ N., long. 52° 51′ W.

53.—*Mediterranean—Algeria—Bona.*—This port is now lighted with four harbour lights, viz., a *fixed red* light on the North Jetty, a *fixed green* light on the South Jetty, and two *orange yellow* lights at the entrance of the basin.

54.—*Korean Archipelago.*—A dangerous sunken reef, lying in the fairway of navigation, has recently been discovered about midway between Ripple and Nimrod Islands, in the Korean Archipelago. The reef (*Seven Reef*), is about half a mile in extent, on which the sea was breaking heavily. From the bearings taken, the reef is in lat. 34° 6′ N., long. 126° 10′ E.

55.—*Mediterranean—Alexandria—Boghaz or Central Pass.*—A floating beacon, painted *black and white in horizontal stripes*, showing about 20 ft. above water, with a *bell* on the top, has been placed on the 3½-fathoms patch in 4 fathoms water with the El-kot beacon bearing S.E. ¾ E. Also a *black* beacon has been placed on the outer shoal or 3-fathom rock, and 1½ cables S.W. of the above named beacon.

Ships approaching the Central Pass will steer between the beacons and then steer by the marks, Mediterranean—Port Said.

The following signals have been established:—A vessel in the Road exhibiting lights at the foremast head, followed either by rockets, blue lights, or a gun, is the signal that she requires a pilot to enter the Port.

The above will be thus answered from the Harbour office. If by a rocket,—pilot is going to you. If by a blue light,—pilot cannot go off to you.

56.—*Ireland—Lough Foyle—Inishowen Lights.*—In accordance with Notice No. 39, in our July Number, the alteration in these lights have been made. The lights now exhibited are *fixed white* lights from both towers, that from the east tower being 67 feet, and that from the west tower 92 feet above high water. The *red* sector of light shewn over the north-east end of the Tuns Bank is exhibited from the west tower 25 feet below the main light, and when shut in to the northwards, clears the Tuns Bank.

57.—*St. Lawrence River—Red Islet Bank.*—A light-vessel painted *red* with *Red Island Light-ship* on her sides, has been moored in 10 fathoms, in a north-easterly direction from Red Islet: from her fore-mast, 34 feet above the deck, a *fixed white* light is exhibited which, in clear weather, should be seen 12 miles. The approximate position of the vessel is in lat. 48° 6½′ N., long. 69° 31′ W. In foggy weather a storm whistle will be sounded 10 seconds in every minute.

58.—*Africa—West Coast—Accra.*—A *fixed white* light of the third order, 50 feet above the sea, has been established on the western bastion of Fort James, in lat. 5° 31′ 48″ N., long. 0° 11′ 31″ W.

59.—*Newfoundland—Cape Ray.*—A *flashing* light, showing a flash *every ten seconds*, but having the appearance of a steady light at a great distance, is now exhibited on the western side of Cape Ray in lat. 47° 37′ N., long. 59° 18′ W.

Gulf of St. Lawrence—Magdalen Islands—Amherst Island.—A *revolving* light showing *red and white* alternately 30 seconds, is now exhibited on the south cape of Amherst Island in lat. 47° 13′ N., long. 61° 58′ W. In clear weather the light will probably be seen about 20 miles.

60.—*Nova Scotia—North Coast—Pugwash Harbour.*—A *fixed* light, showing *red* seaward, and *white* towards the harbour, has been placed on Seaman's or Fishing Point, on the east side of the entrance of the harbour in lat. 45° 52½′ N., long. 63° 40½′ W.

New Brunswick—North Coast—Bathurst Harbour.—Two beacon lights, 120 yards apart, have been placed on Alston's Point, at the entrance of the harbour. The outer light is a *fixed white* light 27 feet above high water, the inner light is a *fixed red* light 31 feet above high water. Position, lat. 47° 29′ N., long. 65° 38′ W.

Gulf of St. Lawrence—Gaspé Harbour.—A light-vessel has been placed off Sandy Beach Point, and exhibits a *red* light 29 feet above the deck. The vessel is painted *red* with the words *Light Ship* on her sides. Position, lat. 48° 50′ 45″ N., long. 64° 24′ 30″ W. The light is for the purpose of guiding vessels into the harbour.

61.—*Thames Entrance—Princes Channel.*—The *S.E. Shingles* buoy has been moved E. ¼ S. one mile, and now lies in 6 fathoms at low water springs, and the *Shingles Spit* buoy has been moved S.E. one cable, and now lies in 6 fathoms at low water springs. The buoys now bear from each other E. ¼ S., and W. ¼ N. $\frac{6}{10}$ of a mile.

62.—*Bermuda.—Alteration of Buoys.*—The *Outer Fairway* buoy has been altered to *black* with *staff and globe.*

All the buoys from *The Narrows* to *end of Stag Channel* are now chequered *black and white.*

Also, a *red* nun buoy, with *Fairway* painted on it, has been placed in the north part of Murray anchorage in 9½ fathoms, about one mile from St. Catherine Point, with the following marks, viz.: St. David's Head just open of the battery at St. Catherine Point S.E. ½ S. and Barrack at Prospect Hill well open of Crawl Point S.W. ½ S. This buoy has been placed as a guide for vessels proceeding to sea; when opening the channel leading through the Narrows, it should be kept well on the port hand.

63. *Japan.—Inland Sea: Eastern Entrance.—Awadji Island, North Point.*—A light has been placed at Matsu-wo-no-hana, the north point of Awadji island, Akasi strait.

The light is a *fixed* light of the first order, 158 feet above the sea, illuminating an arc from seaward between the bearings of West round southward to N.E. by E. ¾ E., and in clear weather can be seen from a distance of 18 miles. Position, lat. 34° 36′ 40″ N., long. 135° 0′ 30″ E.

Gulf of Oösaka—Wada Misaki, Hiogo.—A temporary light, until the completion of the permanent apparatus, has been placed on Wada Misaki, to the south-west of Kobe anchorage.

The light is a *fixed red* light, 52 feet above the sea, and in clear weather can be seen from a distance of 10 miles.

Position, lat. 34° 39′ 30″ N., long. 135° 12′ E.

Temposan Fort, Oösaka.—A temporary light, until the completion of the permanent apparatus, has been placed in Temposan Fort, at the mouth of the Agi Kawa.

The light is a *fixed* light, 53 feet above the sea, and in clear weather can be seen from a distance of 10 miles.

Position, lat. 34° 39′ 45″ N., long. 135° 26′ 35″ E.

64.—*South Pacific—Fiji—Group Levuka.*—Two *fixed* beacon lights have been placed to guide ships into the harbour. The inner light is placed on a hill behind the town, and the outer a little to the south of the Wesleyan Mission-house; they should be seen 5 miles. The beacons are painted *white* with a *red* diamond.

The lights by night and the beacons by day, kept in line, lead through the middle of the south entrance passage into the harbour.

65.—*Spithead—Ryde Middle Bank Buoys.*—The *N.E. Middle* has been changed to a *red* buoy *with staff and globe*, and the *East Middle* to a *red and white chequered* buoy.

In consequence of the above alterations, the buoys marking the measured mile in Stokes Bay are changed to *white* with a *red* staff and globe.

CHARTS, ETC., PUBLISHED BY THE HYDROGRAPHIC OFFICE, ADMIRALTY, IN AUGUST, 1871.

Sold by J. D. POTTER, 31, *Poultry, E.C.*

No.	Scale, inches.		s.	d.
561	m = 0·1	Magellan Strait to Gulf of Penas	2	6
230	m = 0·4	West Indies—Margarita Island and Gulf of Cariaco	1	6
1234	m = 11·4	Africa, West Coast—Port Nolleth or Robbe Bay	1	6

GENERAL.

ROYAL NATIONAL LIFE-BOAT INSTITUTION.—On Thursday, 3rd Aug., a meeting of this Institution was held at its house, John-street, Adelphi, Mr. Thomas Chapman, F.R.S., V.P., in the chair. Rewards amounting to £51 were granted to the crews of life-boats of the Institution for services rendered during the past month. The life-boat stationed at Bude Haven, on the coast of Cornwall, proceeded out in reply to a signal from the yacht *Hattie*, of Cromer, during a strong wind from the N.N.W., and after nearly an hour's labour the breakers were passed and the yacht was reached, when her owner and crew of two men were taken out of the little vessel, which was towed in by the boat. The Fishguard life-boat, the *Sir Edward Perrott*, went off to the aid of a sailing boat which had drifted out to sea, having on board two lads, who were unable to

manage it, and brought them safely ashore. The Chichester Harbour life-boat, *Undaunted*, was launched to signals of distress being shown by a dismasted vessel, which proved to be the brig *Hope*, of Portsmouth, during a very strong wind from S.W., and in a heavy sea. The life-boat remained alongside until the weather moderated, and a steam tug was enabled to take the vessel and crew into Portsmouth. Other rewards were likewise granted to the crews of shore boats for saving life from wrecks on our coasts. A contribution of £800 had been received from "J. M. S.," which was to be appropriated in providing a very fine new life-boat for Wexford, to be named the *Ethel Eveleen*, after the donor's little girl. Mr. J. M. Hetherington, of Manchester, had given a donation of £115 10s. to the Institution. The Ancient Order of Foresters had presented the sum of £100 as their contribution for the past year in aid of the support of their two life-boats, stationed respectively at Newquay, Cardiganshire, and West Hartlepool. A new life-boat had recently been sent by the Institution to Dungeness.

THE NAVIGATION OF THE BOSPHORUS.—The Porte is about making new regulations respecting the passage of the Straits of the Dardanelles and the Bosphorus by merchant vessels. According to the present rule, ships going to the Mediterranean are obliged to stop at the Castles of the Dardanelles and hire a boat in order to land their firman. This measure exposes ships to great inconvenience, and also to some danger, on account of the strong currents running down and the narrowness of that part of the channel. It is now contemplated to station a man-of-war off Galata-Bournou, opposite Gallipoli, at a point of easy access for ships, and the firmans will be received on board the man-of-war. With regard to vessels going to the Black Sea, two steam-launches will be in attendance a little beyond Buyukdereh Bay, which will board every ship passing and receive the firman. Finally, in order to relieve ships coming from the Black Sea and bound to the Mediterranean from the present obligation of stopping at Constantinople to get their firman for the Dardanelles, it is proposed that every vessel leaving the Golden Horn for the Black Sea will be at liberty to take a double firman—viz., one for the Bosphorus and the other for the Hellespont. These new regulations are already decided upon, and there is no doubt that they will prove highly beneficial to navigation when put in force. Merchant vessels are already greatly indebted to the Porte for the permission it has granted them to pass the Straits at night when going out, and it is

to be hoped that before long some plan will be devised by which the like permission may be conceded to merchant vessels passing inward, the only objection to this other concession being the fear that foreign men-of-war might infringe the law, and pass unperceived during the night into Turkish waters.

THE LONGSHIPS ROCK.—The foundation stone of a new lighthouse on the Longships off the Land's End has been recently laid. The old building was somewhat out of character with modern ideas, and we believe there was reason to fear that with age it had become, or was in danger of becoming, unsafe for the habitation of the keepers. The old structure has now lived for nearly eighty years, and probably was not built on such scientific principles of engineering as characterise the lighthouses of these days, so there is some excuse for its premature decay.

The new lighthouse is to be built due west of the present tower, and all but adjoining the same site. To form a solid foundation the rock has been cut down very elaborately, and the first ten courses will be more or less buried in the rock itself. The two first courses will be below high-water mark, and the lantern will be 110 ft. above high-water mark. This is the uniform standard height of all modern English rock lighthouses of the first order. The tower will consist of sixty-five courses of stone. The first fifteen courses will be each 2 ft. thick; the next six will be 1 ft. 9 in. thick, and the whole of the rest, except two, will be 18 in. thick. The two top courses will be one foot and two feet thick respectively. There will be an entrance door at the base. Beneath the floor of the first room will be the fresh water tank, in the body of the solid part of the tower, holding 1,500 gallons. The first room is 9 ft. in diameter, and is intended for landing gear and offices. The second room will be 10 ft. in diameter, and is to serve as a store-room for coals, and a large rain-water tank. The third room will be 11 ft. in diameter, and is intended for stores, provisions, etc. The fourth room will be 12 ft. in diameter, and will be used for oil cisterns entirely. The three upper rooms will be 12 ft. 6 in. in diameter, and will serve severally for a living-room, a bed-room, and a service-room. The light will be of the first order, dioptric and fixed, not revolving. It is calculated that it will be seen at a distance of sixteen miles.

MINERAL OIL FOR STEAMERS.—According to intelligence from Odessa (writes a St. Petersburg correspondent), there is a probability of mineral oil being used as a substitute for coal on the steamers of

the Black Sea. The Government lately placed a schooner at the disposal of an engineer, who after repeated experiments safely took the vessel a distance of 120 miles in a heavy sea. As naphtha can be procured in any quantity on the shores of the Caspian, the use of this fuel will effect an immense saving to the Black Sea Company, and this valuable product will at length be turned to account.—*Nautical Gazette of New York.*

GIBRALTAR.—A Sailors' Home has been established at this port. At present it is on a small scale, but in a short time it is believed there will be accommodation for forty or fifty men. We are truly glad to notice an increase in the number of these establishments, and consider that every encouragement should be given to them. At the same time we do deprecate the continual applications for subscriptions to support them. Donations for building and fitting may very properly be asked for, but as regards the maintenance of these homes, it is obvious that as sailors earn wages they can support themselves. A "Sailors' Home" should, after its establishment, be conducted on the strictest principles of economy combined with comfort, and the seamen should be charged on the same principle, but with such an amount of profit as will make the institution self-supporting.

STANDING INTO DANGER.—"A Master of the Old School" writes:—"After the extraordinary evidence given on Wednesday last at the court-martial on the captain and staff-commander of the *Agincourt*, I have much pleasure in relating an event which took place on the 8th January, 1832, viz., the saving of H.M.S. *North Star* in the West Indies, then commanded by Captain Trefuses, owing to the prompt action of the acting-master of H.M.'s corvette *Hyacinth*, which ship had left Port Royal that morning with some army officers, 300 stand of arms, howitzers, and ammunition, bound to Montego Bay, it being the height of the negro rebellion, and passed Portland Point, Jamaica, a little after four p.m. H.M.S. *North Star* was then in sight, standing to the east. On nearing this ship, Commander Oldrey, of the *Hyacinth*, being junior officer, proceeded on board the former ship and returned at 4.45. The wind was S.E., and at that time Portland Point bore E.N.E., about five miles distant. To the astonishment of Mr. Peacock, the acting master of the *Hyacinth*, he observed the *North Star* bear away, and set studding sails, running down towards the dangerous reefs of Old Harbour, and said to Commander Oldrey, 'Can the *North Star*

be going to Old Harbour, sir?' 'Certainly not,' was the reply; 'she is bound to Port Royal.' Mr. Peacock then said, 'Why, sir, she could not weather Portland Point without a tack, and has set studding sails!' Capt. Oldrey curtly replied, 'You must be mistaken, sir.' Mr. Peacock, after again looking at her with his glass, said, 'I am not mistaken, sir; she is closing fast down upon the reefs, and will be on shore in ten minutes if the signal is not made 'Standing into danger' with a gun. 'Captain' Oldrey replied, after calling Lieutenant Gregory Welsh as a witness, 'Mr. Peacock, you will take the entire responsibility of this signal, sir?' He respectfully answered, 'I am quite prepared to do so, I am quite certain; lose not a moment, or it will be too late.' The signal was hoisted with a gun, the helm of the *North Star* was immediately put down, the yards promptly trimmed, and the ship was saved. At that moment, as Mr. Peacock was afterwards informed both by Captain Trefuses and Mr. George Parsons, the master, the leadsman called quarter less four, and the rocks were visible under the bottom. It turned out that, the weather being hazy, Portland Point was mistaken for Yallas Point, and, it being Sunday, Captain Trefuses was dining with his officers in the gun-room, not deeming the ship to be near any danger. I do not think Mr. Peacock received any commendation for this firm step beyond the personal thanks of Captain Trefuses and Mr. Parsons, but I have heard that he made enemies of his superiors, and received such ungracious treatment generally in respect to promotion, pay, etc., as a master, that he resigned his commission in disgust in 1840, without ever receiving a farthing of half-pay or any reward for upwards of twelve years' arduous service in all parts of the world; having, as I am assured, spent nearly all his private patrimony in the service to support himself as an officer and a gentleman."

Ships Under Construction.—The following iron and armour-plated men-of-war are at the present time under construction for the Government in Her Majesty's dockyards and by contracts:—The *Fury*, armour-plated turret ship, 4 guns, 5030 tons and 1000 horse-power engines, building at Pembroke; the *Blonde*, iron steam frigate, cased with wood, 26 guns, 4039 tons, 1000 horse-power engines, building at Portsmouth; the *Thunderer*, armour-plated turret-ship of 4 guns, 4406 tons, and 800-horse power engines, building at Pembroke; the *Rupert*, ironclad ram 4 guns, 3159 tons, engines of 700 horse-power, building at Chatham; the *Gorgon*, double screw iron armour-plated turret-ship, 4 guns, 2107 tons,

and 250 horse-power engines, building at Jarrow-on-Tyne; the *Raleigh*, iron frigate sheathed with wood, 22 guns, 3210 tons, and 800 horse-power engines, building at Chatham Dockyard; the *Hecate* and *Hydra*, double screw iron armour-plated turret-ships of 4 guns, 2107 tons, and engines of 250 horse-power each, building at Poplar and Glasgow; the *Frolic*, *Kestrel*, *Ready*, and *Rifleman*, double-screw composite gun-vessels, of 4 guns, 452 tons, and 100 horse-power engines each, building at Chatham.

Turkish Torpedoes.—Two kinds of torpedoes—offensive and defensive—have been devised for use in the Bosphorus. The defensive torpedo consists of a strong wrought-iron tank capable of containing about 4 cwt. of powder and lying at the bottom of the water. From a fuse in the interior proceeds an electric cable containing a double wire and communicating with a voltaic battery on shore. The tank is also provided with an index which floats within 5 or 6 feet of the surface of the water, and which, on being touched by the bottom of a ship, immediately conveys a signal to the shore whence an electric spark would be sent through the powder in the tank, the explosion either sinking or disabling the ship above it. The offensive torpedo is intended for attacking, under cover of a dark night, enemies' ships lying at anchor, and it consists of a hollow iron pear-shaped vessel containing a heavy charge of powder and provided with several percussion fuzes. This kind of torpedo is fixed to the end of a boom some 30 feet long, which is attached to the head of a small steam launch specially constructed for the purpose. To the boom, which hinges on the head of the vessel, is attached a chain, which runs in board over a pulley, and which can be shortened or lengthened at pleasure, raising or lowering the torpedo in the water. The upper portion of the torpedo case is provided with five percussion fuzes, one of which is certain to strike a ship's bottom when propelled against it.

The Tea Trade via the Suez Canal.—The voyage of the steam ship *Australia* with the new teas from Hong Kong through the Suez Canal is worthy of notice. The splendid clipper sailing ships have had their day; it is not at all likely that we shall again hear of the exciting ocean races of these fine vessels unless our coal supply is exhausted sooner than we calculate. We have been favoured with a short account of the passage of the *Australia*, the vessel which brought the first cargo of the new season's teas, but our space will not allow us to publish it at length. This vessel is

one of the largest of the steam fleet of the Pacific and Oriental Company, her gross tonnage being 3648, and she was laden with upwards of 35,000 packages, which included 34,516 chests of tea, besides mails, etc., which she carried. She commenced her voyage on the 9th June last, and reached Southampton on the 29th July, thus accomplishing her voyage in forty-nine days. This makes the ninety days' passage of the clipper ships look rather absurd in comparison. It appears that seven steamers started and endeavoured to make something of a race of it; indeed a rumour reached those on board the *Australia*, that the *Enterprise*, one of the seven, and a large and powerful vessel, had entered the Suez Canal the day the *Australia* left, and had taken on extra engineers and was piling up the coals, with the intention of doing her best to overtake the *Australia* if she could; but she was not successful. The *Australia* grounded rather seriously once in the Canal, but with the assistance of a tug which happened to be near, was got off without much difficulty or loss of time.

Austrian Tonnage.—The Rules in force concerning the measurement of tonnage of merchant ships have been adopted by Austria; accordingly by an order in Council Her Majesty has been pleased "to direct that the ships of Austro-Hungary, the certificates of Austro-Hungarian Nationality and Registry of which are dated on and after the 1st day of September, One Thousand Eight Hundred and Seventy-one, shall be deemed to be of the tonnage denoted in the said certificates of Austro-Hungarian Nationality and Registry."

Capt. Hall's Arctic Expedition.—The steamer *Polaris*, carrying Captain Hall's Arctic exploring expedition, touched at St. John's, Newfoundland, where the explorers were warmly welcomed at a banquet by the Governor, and at parting received a hearty "God speed." They remained ten days, leaving on July 19th for Greenland.

THE

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THE PROGRESS OF THE BRITISH MERCANTILE MARINE.

Of the many commercial and industrial interests of the British Empire, the Shipping certainly commands attention for its pre-eminence and its necessity to our well-being and commercial progress. But for the command of the seas we should have remained a petty insular State, circumscribed in area and limited in the means of development, owing to the dearness and deficiency of raw materials. But as the greatest maritime power of the world our flag carries British Commerce and Manufactures into every port, and our Anglo-Saxon brethren across the Atlantic, energetic off-shoots of ourselves, although as numerous, pale before us in the extent and importance of the mercantile fleet engaged in the carrying trade.

The progress of the Shipping trade is necessarily contingent on the increase of our Commerce, and the surprising advance in this respect is shown by the following official figures:—

	Computed net value of the Imports.	Declared net value of the Exports of British produce and Manufactures.
1855 ..	£143,542,850	£95,688,085
1860 ..	£210,648,643	£135,891,227
1870 ..	£295.428,967*	£199,640,983

Of the total mercantile tonnage of the world, some fifteen and a half million tons, Great Britain possesses about one half, the

* 1869. The returns of imports for 1870 not yet published.

United States one-third, France and Norway about one million tons each, and Holland, Russia, Spain, Denmark, Austria, and the other maritime States make up the remainder.

The amount of capital invested in our shipping, and the large number of persons directly and indirectly employed therein, whether occupied in the business of the carrying trade, or following pursuits dependent upon shipping arrivals and departures, give to the Shipping Interest an importance not shared by other pursuits.

If we take the latest official returns we find that there are owned in the United Kingdon about 7,200,000 tons of merchant shipping, and estimating this at £12 a ton, it would give us a capital of over £86,000,000, as the aggregate value of the shipping, but as there are numerous first class steamers included in our mercantile fleet, this value should be largely augmented. In 1842 the shipping registered in the United Kingdom and her colonies numbered 30,815 vessels, measuring 3,619,850 tons, and employing 214,609 seamen. We had on the register belonging to the United Kingdom in January, 1870 (exclusive of those belonging to our colonies and possessions), 26,389 ships, measuring 5,634,727 tons, with crews numbering 243,991 men, and of these, 2,963 vessels and 947,021 tons were steam vessels.

If we glance at the past and present position of the merchant navies of the world we find, that whilst our own tonnage has been rapidly increasing in the last twenty years, that of the American Republic has been declining. It should also be borne in mind that in consequence of steps taken to clear the British register in and since 1854, and in consequence of alterations in the system of measurement, the British tonnage as compared with previous years is a great deal less than it would have appeared to be, if the old plan of taking the figures had continued, probably by 400,000 tons. In 1855 we had 5,250,000 tons of shipping registered in the British Empire, and the United States had nearly about the same, of which half were registered for foreign trade and half enrolled and licensed for home trade.

Since that period the British mercantile tonnage has risen to 7,200,000 tons, whilst the American tonnage has declined to 4,200,000 tons, of which only half be it remembered are sea-going ships. France since 1854 has increased her mercantile marine by about 250,000 tons, and it now stands at a little over 1,000,000 tons. Norway owns about the same amount of tonnage, and has doubled it in the period under notice. Holland owns 528,000 tons, and has rather retrograded, for she possessed in 1857 over 621,000 tons. Ship building in the United Kingdom continues steady, for the

average tonnage built in our yards in the last ten years has ranged from 250,000 to 460,000 tons per annum, some portion being even constructed for foreigners.

In 1860 the average tonnage of the vessels belonging to the United Kingdom was but 173 tons, in 1869 it was 210 tons, shewing that a larger class of vessel is the rule now. Of course this general average is an unfair criterion of the class of vessels chiefly built now, and is only arrived at by dividing the aggregate existing tonnage by the total number of vessels on the register. The number of men employed including masters is upwards of 250,000.

Not very many years ago it was thought that the United States would become a formidable competitor with us in the foreign carrying trade of the world, but this idea has passed away, for we still hold our own in all foreign ports, and can compete successfully even under existing restrictions and disadvantages. Our foreign trade employs over 35,000,000 tons of shipping annually of which 70 per cent. is British. The foreign trade of the United States employs but 17,500,000 tons, of which under 39 per cent. is American tonnage. In Dutch, Swedish, Prussian, and French ports, the foreign tonnage largely outstrips the native tonnage in the carrying trade, in the proportion of two to one, and the British flag takes the lion's share.

In the direct trade with the United States the manner in which we have taken the place of American shipping is remarkable and noteworthy.

		British ships.	American ships.
In	1853 ..	857,250	1,592,939
	1858 ..	562,048	1,826,841
	1863 ..	1,173,463	927,186
	1868 ..	2,103,872	714,423
	1869 ..	2,464,012	669,444

Last year however there was a slight recovery on the part of American ships, the tonnage having risen to 1,125,000 tons.

As the present writer pointed out some years ago when touching on this subject, time has now become such an important element in business, that a ship must not only be of good capacity for stowage and seaworthiness, but must also have a reputation for fast sailing. It is after this combination that shipbuilders now strive, and there is no reason why the two essentials may not be combined with judgment and due adaptation to circumstances and voyage. When we observe the improvements of a few years past, we feel confident that future chroniclers in after years will have much more important improvements to record.

The gross foreign tonnage entering and clearing at our ports with cargoes is about 9,000,000 tons, and has now for several years formed about thirty per cent. of the whole shipping trade of the United Kingdom. Norwegian and Prussian flags take the largest share of the foreign shipping, 1,661,000 and 1,000,000 respectively; then come the United States and Hamburgh, 845,000 and 827,000 tons respectively; France, Denmark, and Sardinia rank next, each between 500,000 and 660,000 tons; the other maritime countries standing in the following order: Sweden, Russia, Austria, Spain, Holland, Mecklenburg, and Belgium.

In 1854 the vessels which entered our ports from foreign countries and British possessions with cargoes were 17,656 British ships, registering 4,790,000 tons, and 14,872 foreign ships registering 3,110,000 tons. In 1870 the numbers were 27,322 British ships, measuring 10,310,000 tons, and 18,605 foreign ships, registering 4,601,000 tons. One-fourth of the foreign tonnage is under the Norwegian and Swedish flags.

In estimating the carrying trade of the world, due regard must be had to the difference which the increase of steam tonnage has effected in the speed of voyages, and thereby shortening, as it were, previous distances. Our steam tonnage has doubled even since 1860, for there are now upwards of 1,000,000 tons of steam tonnage registered in the British Empire. The United States has if anything rather more steam tonnage, but only one-fifth of that amount is registered for over-sea foreign trade. The other maritime nations have comparatively small steam marines. France has 135,000 tons, Hamburgh 39,000, and Holland 22,500 tons.

Whether viewed in relation to its character, management, or the aggregate importance of the trade in which the ships are engaged, the British Mercantile Marine contrasts favourably even with the vast American Republic, whose shores are one continuous seaboard, and whose vast inland waters and rivers necessitate an immense employment of various craft for the transport of every description of produce and merchandise to and from the coast. Two millions and a half tons, or half the aggregate tonnage of the United States, is constantly employed on her coasts, rivers, or lakes. Limited as our coasts are in comparison, we had in 1870, 140,561 British vessels of 18,176,313 tons reported as having entered and cleared at our ports, employed in the coasting trade alone.

Some of the main reasons of our preponderance in shipping are, that we have more colonies, more extensive and varied manufactures; that Great Britain is the entrepôt of supply for the continent in many leading staples; that there is an enormous emi-

gration from our shores, a quarter of a million outward passengers a year adding largely to the shipowners' profits, to say nothing of arrivals.

If England expects to manufacture for the rest of the world, she must perforce bring her customers as near to her as possible. If she is to continue to supply population to colonise distant lands, she must render the passage of the emigrants thither speedy, economical, and comfortable. Every improvement therefore in the build and speed of vessels, when combined with safety, is of the greatest advantage to all interests in the United Kingdom.

From the figures cited, it will be seen that the value of the ships and cargoes that annually arrive at and leave our ports cannot be less than £550,000,000; of this large amount of property, and proportionate number of lives forming the extensive passenger trade of the oceans, how comparatively small is the loss, especially on long and distant voyages, for it is on our own coasts,—in the British Channels,—where the most frequent disasters occur. Even with the great increase of shipping the average loss of ships on our coasts has seldom averaged more than 700 or 800 in the year, and only on three occasions in the last twenty years has the loss of life exceeded 1000, viz.: 1549 in 1854, 1645 in 1859, and 1333 in 1867. With 250 life-boats and 284 rocket and mortar stations, our splendid lighthouses and abundance of sea-marks, everything is done to save imperilled lives.

The noble ship, it has been well observed, that leaves our harbour for a distant port, epitomizes two thousand years. The manufactures which freight her represent the skill of hundreds of years of trial. The ship itself stands for the thought and ingenuity of thirty centuries; the skill that navigates her, playing with the winds, eluding or braving storms, searching out the quickest paths on the round water, and knowing where to find the wind-breath that helps, and how to shun those that hinder; reading the heavens like a book; standing at midnight by the illuminated binnacle, watching the silent needle; and plunging through the waves without eyes as directly as if the gates of every harbour shone clear across the ocean!

This skill is to a certain extent the natural result of continued experience, but science is the great magician which has effected the principal transformation.

> Across the seas the sailless vessel flies,
> Throughout the land the steedless chariot plies,
> High o'er the waves the Menai wonder strides,
> While man walks dry-shod here beneath the tides,
> Words speed like thought along the electric ro..;
> Proud Science is abroad in semblance of a god.

Science pours a few drops of water into a syphon and raises a hundred tons. Steam is a greater reformer than the sword; electricity, than the cannon; the printing press, than the forum.

Great Britain with her vast commerce, her numerous ships, and her wealthy and enterprising merchant princes commands the admiration of the world; her proud and formidable navy traverses the ocean, that highway of nations, guards her remote colonies, and her ships float like enchanted castles along her sea-girt shores. Well might the poet say

> "Britannia needs no bulwarks,
> No towers along the steep,
> Her march is on the mountain wave,
> Her home is on the deep."

Britain's enterprising sons have steered for India and explored her burning plains, have peopled Australia and New Zealand, have set up her standard in the Eastern Archipelago and on the very borders of the Celestial Empire, have wintered within the Polar circle, and, circumnavigating the globe, have planted her missionaries here and there throughout the lovely islands which dot the Pacific. During the present century, the navigators of Europe have discovered rivers unknown to song, new islands teeming with population, and have borne to barbarous tribes, Christianity, civilization, and commerce. Truly our age is one of navigation, discovery, invention, and progress.

The great Anglo-Saxon family is pretty equally divided between the two hemispheres. There are now nearly forty millions in North America and the adjacent islands who speak the English language. The most intimate intercourse and extensive commerce between the two branches of this vast family are felt to be of incalculable importance to their best interests and well-being. They are obeying this necessity by increasing the means and motives of social and commercial intercourse from year to year. We have laid at great expense submarine cables for instantaneous communication, cheapened postage, introduced the money order system, and encouraged everything calculated to facilitate commerce.

About a quarter of a century ago the foreign and colonial mails were all conveyed by sailing packets. At that period there was only mail communication with France four times a week, and with America once a month. The mail passage to and from the latter was reckoned by weeks. With the East Indies there was no mail communication whatever. The foreign or colonial mails made up in London on Wednesday were dispatched from Falmouth

(then the principal packet station of the country) on the following Saturday—three days afterwards—*provided* the wind and weather permitted it. England is now celebrated for the extent and perfection of her mail packet service; in fact it may be almost said that she carries the seaborne correspondence of the whole world. From east to west, between China and Chili, passing through the four quarters of the globe, and from north to south, between Hamburgh and the Cape of Good Hope, her great mail packet lines extend, and from them an immense number of branch lines shoot out, many of which are thousands of miles in length. From the experience of the past it would appear that the Anglo-Saxon race —who are probably destined ultimately to people the principal portions of the globe—are alone capable of keeping a footing, as it were on the great ocean pathway.

At the present time all foreign and colonial mails are conveyed by steam vessels. The postal communication with France is twice a day, and with America every other day or oftener, and we look as regularly for our American letters to the hour as we do our communications from Ireland or Scotland.

How much of the world's progress has been effected by the influence of navigation and commercial intercourse! Commerce and arts have changed the relative position of nations. Once upon a footing of barbarism and hostility, nearly all are now placed upon a footing of friendship and civilization. Science has accomplished much too for Navigation as well as Commerce. She has mapped out the oceans, defined correctly the boundaries of land and water, surveyed dangerous reefs and coasts, sounded shoals and ocean beds, erected durable lighthouses, useful landmarks and beacons for the mariner, and placed for his further security and guidance breakwaters, piers, and buoys.

Science has ascertained the sets of the tides and currents, invented instruments by which the navigator is warned of almost every danger that can befal him, and even advised of his proximity to icebergs or of his near approach to land; by their aid also he can define his exact position on the boundless ocean. Nearly every river and harbour which he has occasion to frequent has been accurately sounded and surveyed; and he now shapes his course as correctly for his destined port, and anchors as securely and safely as if he had been travelling on a well-marked river, instead of over a pathless sea. But Science has done more than this for him; it has from careful observations deduced laws by which he may escape the ravages of those devastating hurricanes, which occasionally bring destruction on all within their reach; and has taught him by

composite or circle sailing, to make the passage round the globe in something less than half the time formerly required.

The Shipping Interest is largely aided by the enterprise of our capitalists and merchants. We have taken an active and leading part, either by money or material, in all the great constructive undertakings carried out of late years for the improvement and extension of Commerce;—and the Panama Railway, the Pacific Railroad, the Suez Canal, the Mont Cenis Tunnel, the Victoria Bridge over the St. Lawrence, the network of railways in India, in British North America, and in Australia, the thousands of miles of overland and submarine telegraphs and cables are so many valuable aids to the progress of settlement and the extension of that carrying trade of which we have the largest share. New marts are opening up day by day for British trade and manufactures. Our Colonial progress is rapid and prosperous, for never before in the world's history were seen such Colonial empires as extend in all directions under British rule—in India, and the East, in Australasia, in Africa, and in North America. All these are pregnant with deep results in swelling the tide of commerce, and all classes of British subjects at home or abroad share in the common weal.

But there are other points which help to swell the current of British Commerce. Great rivers, which were never thought navigable, have by British enterprise become changed in their aspect. In Australia the Murray and its tributaries now bear down to the sea rich cargoes of wool, tallow, hides, and other colonial produce, to the delight of the squatter and the manifest enhancement in value of his land and his flocks.

Another vast continent, South America, has opened up its interior treasures to commerce, furnishing new markets for our manufactures, new fields for agricultural and industrial enterprise, and numberless new products from regions comparatively unknown and unexplored, but abounding in all that can minister to the wants of man. The steamer now floats proudly on the Magdalena, stems the broad torrent of the Amazon and its confluents, penetrates into the interior rivers of Peru, and traces the important affluents of the Rio de la Plata into Paraguay and Brazil. Who can tell the benefit which shall result to the various South American republics from the extension of steam into the great watershed of the continent—thus opening up the highways which Providence has munificently supplied? The inhabitants are no longer shut out from communication with the sea, and produce which formerly had to be conveyed long and expensive journies by land on the backs of mules or alpacas, and then by circuitous voyages on the Pacific and

round the Horn, are now brought promptly and economically direct to the Atlantic ports in a brief space of time, and at little cost, for shipment to European markets. The navigation of the Niger by British steamers has opened up numberless new channels of commerce. The legitimate trade of Western Africa, its nut and palm oils, its cotton, its ivory, and its dyewoods, have taken the place of the base traffic in human beings—and round the eastern and western coasts towards the south, whether in the diamond fields, or the thriving colony of Natal, British enterprise is opening new fields of supply, and new markets for our commerce.

Passing eastward, we find our commerce has made rapid strides in China and Japan, empires formerly closed to our trade; but the wall of exclusion has now been broken down, and our merchants and traders are permitted easy access, the great river of China being navigated by British steamers. Each and all of these are subjects of importance to the British mercantile marine and shipping interest, for these are the channels which swell European commerce.

In conclusion, in the words of a practical teacher it may be shown how dependent we are upon the raw materials of commerce for our prosperity and comfort, for without an extensive mercantile fleet we could not maintain our supremacy as the carriers of the world. Dr. Yeats, in his recently published work on "The Natural History of Commerce," well observes, "Without a considerable knowledge of raw materials and their adaptations we could not live; and without an unremitting application of such knowledge we could not live in comfort. We may ever measure a country's civilization by the extent and diffusion of this important knowledge. The economic history of a nation would be a record of the discovery of new raw materials, of new sources of supply, and of additional applications. All such discoveries tend to our benefit, while the result is occasionally to enrich the discoverer, and to change the face of our social and industrial life. We have only to contrast the present period of our history with any former period, or the condition of any one country with another, to perceive the effect of such knowledge upon human well-being. Every year adds to our list of useful animal, vegetable, and mineral substances, while the increasing consumption of those already known calls forth as a rule increased production. Thus the importance of a knowledge of raw materials cannot be overrated. It is a matter of personal interest to everybody in every part of world."

P. L. SIMMONDS.

NEW BEACON-BUOY IN USE ON BOARD H.M.S. "LIGHTNING."

As many of our readers are doubtless interested in nautical inventions or improvements, we beg to call their attention to the engraving in our frontispiece of a safety-beacon and portable tide-guage, which are now in use on our West Coast survey under the command of Staff-Commander John Richards, of H.M.S. *Lightning*.

In marine surveying it is often necessary to use floating beacons, and it is very desirable that such marks should not range about with the wind or tide, but remain fixed in one position; this has been accomplished in Captain Richards' beacon. It can be moored taut, head and stern, as represented in the sketch, will carry a much larger mark than any other kind of beacon-buoy, and will rise easily to the heaviest seas: in proof of which may be adduced the fact that the one now in use has been moored at one of the most exposed places outside Morecambe Bay for more than two months, and although the wind has partly destroyed the mark on the mast, neither the beacon nor its wooden platform have been injured or strained in the least degree.

This safety-beacon is moved about easily—as a boat—with two oars and a steering scull, and sails fairly with the wind free; carries all her own gear, viz., two 1½ cwt. anchors, 36 fathoms of the *Lightning's* stream chain and tackles for working it; besides oars, mast and sails, and a crew of five men.

The beacon is put to various uses on board the *Lightning*, amongst which may be noticed conveying fresh water off to the ship *in bulk*. One of the objects for which it was constructed, however, may be explained as follows:—when surveying flat, shallow coasts where sandbanks dry at low water far from the land, as at the River Dee and Morecambe Bay, it is occasionally necessary to fix a tide-guage far from the shore, where it can only be registered by a person stationed afloat, and as an open boat only was available in the case of the *Lightning*, Captain Richards was desirous of securing the tide-marker against liability to danger, from the sudden rising of the wind and sea during the unavoidable absence of the ship. It will be seen that the beacon makes a perfect life raft, and a not uncomfortable residence for one man.

The wooden platform surmounting the pontoons is quite out of reach of the sea; it is six feet long and includes a space, nearly square, covered by a tent of No. 1 canvas (painted), distended by

RICHARDS'S BEACON BUOY AND TIDE GUAGE.

Scale ½ of an inch to a foot.

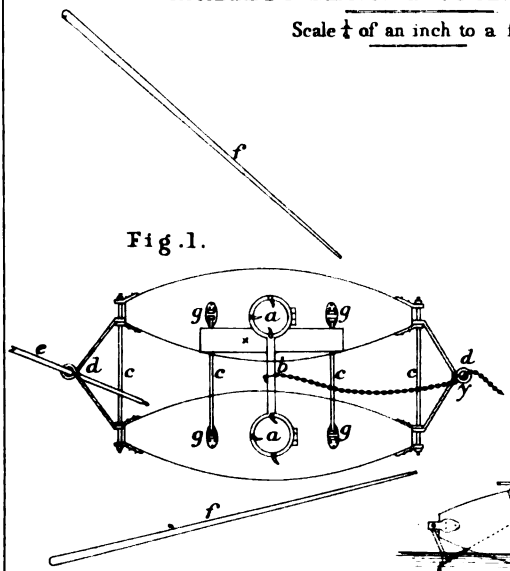

Fig. 1.

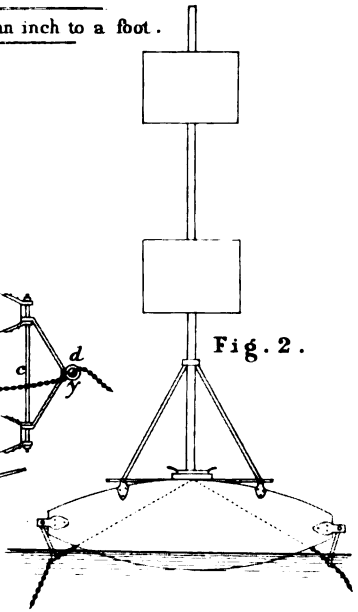

Fig. 2.

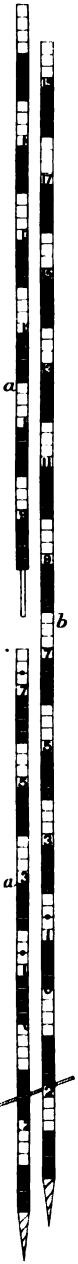

Fig. 4.

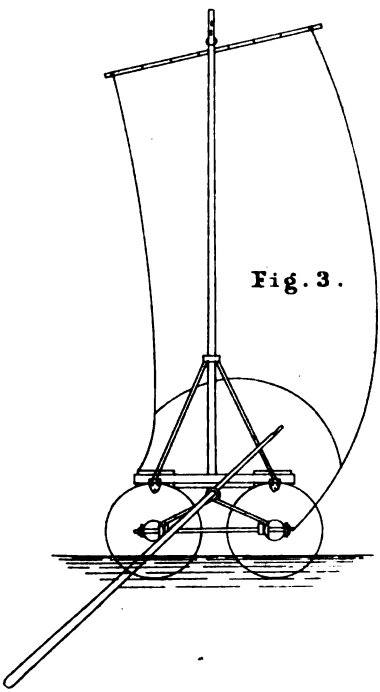

Fig. 3.

Fig. 1, *a . a, Manholes with watertight covers.*
b, Iron connecting bar; is used also for securing cable and step of mast,
c, c, c, c, connecting rods; the inner rods are principally for supporting a wooden platform;
Note, the platform is formed of separate pieces of fir plank each 8 feet long, which are rove under the centre connecting rod and above the next as at x.
d, d span shackles for leading the cable through as at y, used also when turned up for the steering oar (e),
f, f, oars to be rove through rope grommets at g. g.
Fig. 2. *The Beacon moored in position.*
Fig. 3. *The Beacon under sail.*
Fig. 4. *Tide Scale.*
a, side view,
b, front view,
c, iron rod lever.

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the four stout iron rods which support the mast. On the apex of each pontoon, in connection with the upper wooden platform, are manholes, fitted with water-tight covers, giving access to their interior, and enabling one of them to be used as a kitchen and storeroom for the tide-marker; whilst in the other he may sling his hammock.

Now it is a well-known fact that the buoys at present marking our outlying dangerous rocks and sandbanks, although of immense size, are useless for any other purpose; they require a vessel to carry them and all their mooring gear into their stations; they strain their moorings in a heavy sea, causing much wear and tear of chain; they spin round in a tide-way, and are dangerous to approach; they cannot carry a large beacon; and it is therefore worthy of consideration whether some such thing as the safety beacon should not supersede the ordinary clumsy buoy at the most dangerous places on our coasts.

The beacon seems to be specially adapted for carrying a bell; for if placed well above the sea, at the summit of a tall mast, it would ring easily with the slightest motion and be better heard.*

The *Lightning's* tide-guage is shewn in Fig 4. It is made out of a ship's steam boiler tube, having a screw point fitted to one end and a tapered ashen pole at the other. The guage being in two parts is very portable; it can be screwed into the ground in a few minutes, and will stand firm and erect in a strong tide without guys or supports of any kind. When the range of tide exceeds twenty feet, two of these guages are used as near to each other as convenient; the zero of the upper pole being screwed into the ground so as to be level with the top of the lower one.

NOTICES TO MARINERS.

The heading, "Notice to Mariners" is familiar to every sailor. He sees it wherever he goes; on leaving the British shores it appeals to him with a sort of "Pray take care of such and such a danger," or "Don't forget that this or that light will guide you into safety." Again, on touching at any foreign port he encounters the familiar

* When not in use the beacon is disconnected and hoisted on board the *Lightning* with the boat's davits, as easily as a couple of dingeys; and they are stowed, one on either side, abreast the sponsons.

announcement still appealing to him or addressing to him practical words of warning. But it is not only the British sailor who is thus cautioned; in every language of the civilized world these notices may be found urging with mute earnestness their important warnings upon all those who "go down to the sea in ships, and have their business in the great waters." There is not one of our readers we venture to say, who is not fully aware of the value of these announcements; all sailors look eagerly for them, and thankfully accept their valuable aid towards the safe navigation of their ships.

It might perhaps be supposed that in these scientific days, when improved charts and elaborate sailing directions are within easy reach of most navigators, that the simple "Notice to Mariners" had lost something of its old *prestige*, but although both for our Royal Navy and our merchant service there are careful eyes ever on the watch to note the most trifling hydrographic alterations, which are forthwith set down in the proper charts, and in the sailing directions, the simple notice still retains its value, for by its aid the master of a ship is enabled to correct his own chart, and thus to become almost practically acquainted with the particular object to which the announcement gives publicity. Masters of vessels cannot always be changing their charts, and in the intervals between the buying of new ones, the notices to mariners are to them simply invaluable. Of course what we have now stated is well known to all sailors, but as the *Nautical Magazine* frequently falls into the hands of those whom without disrespect may be called "land-lubbers," we do not think our remarks on this subject will be altogether thrown away. Landsmen we know have very vague notions concerning these notices to mariners; they seldom trouble themselves about them, feeling that the announcements are such as cannot interest or affect them in the slightest degree. In every sense of the word, they are simply and purely notices to *mariners*. The technicalities would be sufficient to confuse any person who was not learned in nautical matters. Landsmen, whose knowledge of guiding marks extends to little more than lamps and sign-posts, could hardly be expected to know much about the bearings and uses of lighthouses, beacons, buoys, and other "marks and signs of the sea."

A century or more ago, when navigation had not reached its present gigantic proportions, these nautical announcements were few and far between; their publication was eagerly looked for by mariners, and they were undoubtedly of great service. They generally told of some very serious danger, or of the establishment of a most important guiding mark, the latter an event of

no little importance at that time. Now-a-days notices are "as thick as leaves in Vallambrosa," and they publish for the benefit of mariners a vast quantity of most valuable information. The numerous recent additions to the lights of the world of themselves necessitate a large increase in the number of notices, for besides their own establishment they constantly involve changes in neighbouring lights, so that the individuality of each separate light may be preserved, and not rendered liable to be mistaken for another, all of which changes must be duly advertised. They also indicate the positions of all known dangers, and often point out the localities where unknown dangers are supposed to exist. Such warnings make men very careful in navigating the doubtful places, and the truth as to the existence of the reported dangers is very soon arrived at from the concurrent or diverging testimony of navigators in the vicinities alluded to.

The pointing out of the positions of rocks and shoals, the advertisement of the means by which they may be avoided; the information as to lights, beacons, buoys, fog-signals, and as to the peculiarities of coast line, tides, currents, and prevailing winds; the directions for entering channels and harbours by day or night; —all these particulars make the notices to mariners of truly cosmopolitan utility. They find their way into every quarter of the globe, and diffuse among the seamen of all countries that information which helps them to navigate dangerous localities with greater safety. It is almost impossible to over-estimate the benefits conferred upon humanity at large by the publication of these particulars. They promote international communication, and aid in no mean degree in the progress of civilization all over the world.

As regards the coasts of Great Britain there are three Boards or General Lighthouse authorities, who publish notices to mariners concerning the navigation adjacent to our shores. The foremost is the Trinity Board, who have issued notices, we were going to say from time immemorial, but at any rate when our great-great-grandparents were alive, the Trinity Corporation were sending out their notifications of the establishment of new lighthouses or light-vessels, of the placing of buoys or beacons, or cautioning mariners as to the perils of certain localities. The Commissioners for Northern Lighthouses, by no means so ancient a body as the venerable Trinity Board, have now for a number of years sent out from Edinburgh announcements concerning the navigation of the Scotch coasts; and from Dublin, the Irish Ballast Board, or as more recently styled, the Commissioners of Irish Lights, have sent and continue to send out their notices as to the dangers

of the "melancholy ocean" contiguous to the shores of Ireland. The notices printed in the form of handbills are sent by these authorities to all the custom houses round the coast, where they are fixed up so as to catch the observation of nautical men; they are also sent to the pilots who ply in the vicinities affected by the respective notices; all the foreign consuls in London have a supply sent to them, which they forward to their respective governments for publication; they are also republished by the Admiralty for the information of the Royal Navy, and by them again distributed to all the foreign governments and consuls; and they are advertised in such of the daily and weekly press as are considered desirable mediums for appealing to the maritime community. Besides these means of distribution, the authorities afford every facility to individual mariners who may desire to obtain certain notices. A stock of handbills is always kept by the authorities, and any seaman on "application" will be furnished with a copy of whatever announcement he may require.

Information concerning foreign coasts is collected by the Admiralty and published by the Hydrographic Office of that Department. The particulars reach the Admiralty through various channels; direct from foreign governments, or through the Foreign Office, Board of Trade, or consuls, also from their own officers and those of the merchant service. The foreign notices have to be very carefully translated, as the technical expressions of one country do not always apply literally to those of another, and the greatest care and vigilance are necessary so as to prevent a wrong impression being conveyed in the translation; the greatest simplicity of language is also studied in order that the unlearned may clearly understand it. These translated notices are sent to every country which has a ship on the seas, and even to the one from whence they emanated: and they are often retranslated by foreign governments and reach the Admiralty again in a new form and language. They are also forwarded to the Trinity House, who republish for the general information of English seamen, such of the information as they consider desirable.

Such is a brief sketch of the mode by which mariners are informed of the changes which are constantly taking place in all parts of the world, and of the means adopted in the various countries for facilitating the navigation of their coasts. It is all done by a humane system of international reciprocity; we give and take freely, and mankind all over the earth is benefited.

Without undue boasting we think we may, as a nation, take to ourselves some credit for this eminently satisfactory state of things.

We have done a good share of the work by which civilization has been urged onward and humanity protected. Our ships have found their way into many places, where amid the evils of slavery, piracy, and ignorance, wretched people have lived and died like so many brutes. But the sparks of intelligence and goodwill carried by our ships into those dismal regions have set fire to those abuses, the stagnant intellect has been developed, and unnumbered blessings have followed. Those officers who at this day are surveying far off localities and indicating their special dangers, or who are repressing with strong arms the slave trade or piracy in far distant seas, may well congratulate themselves on performing a high, cosmopolitan duty, a duty which is an honour to the men engaged in it, and a glory to the nation which organizes and encourages it. No other country but our own is at present willing to undertake these duties; but there are not wanting happy signs of all nations combining sooner or later in such humane works for the common good of mankind, even as they now combine to establish a universal system of giving notice to mariners of the perils of navigation.

FORBES'S PATENT SCHOONER RIG.

Mr. Forbes, an old and valued correspondent to this journal, has recently addressed the following letter to the *Nautical Gazette* of New York, on the subject of his patent schooner rig. We reprint the letter for the information of our readers, and we can only remark that for economising labour and expenditure, Mr. Forbes's new rig seems to possess special merits. We are not so sure of its superiority as regards efficiency, over the old rig: it is difficult to judge of such matters without some sort of practical experience of its working. Mr. Forbes states the case very fairly, and places the merits and demerits of both systems in candid juxtaposition, and the result certainly appears favourable to his plan. We hope before long to receive fuller information upon this subject.—[Ed. *N.M.*]

To the Editors of the Nautical Gazette,

Having some claims on the sympathy and confidence of seamen, by reason of the introduction of the double topsail, now so universally adopted, I desire to call the attention of your readers to my new rig for schooners.

While it is more necessary for large vessels, especially for the large three-masted schooners now so common, it is well adapted to all classes of schooners, and I see no reason why it will not be equally good for yachts. It consists in filling the space between the masts, whether in vessels of two masts, or vessels with more than two, with staysails instead of gaff-sails.

Taking as an example a three-masted schooner of large size, where, in the old rig, the foremast is supposed to be 82 feet long, 28 inches in partners, the main 84 by 27, and the mizen 86 by 26; the bowsprit 30 outboard, by 28 inches—it is usual to support the masts, booms, gaff and sails by stays leading from masthead to masthead; and as all depend upon the integrity of the forestay, the bowsprit and the bobstays, these are made very heavy and expensive, and in spite of all precautions, bowsprits and masts are frequently sprung. Among the other prominent disadvantages of this rig, may be cited, the immense bulk of the canvas; the expense of large patent blocks; heavy gaffs; the danger of jibing with gaff-sails set; difficulty of reefing; danger of letting out reefs in a temporary lull during a gale, which is a most dangerous time for a deep-loaded vessel; the difficulty of replacing a large mast in a foreign port; the ill setting of gaff-topsails over boomsails, unless the booms are hauled almost fore and aft, whereby the lower part of the sail does more harm than good; the immense wear and tear on the very large sheets of canvas in moderate weather and a rolling swell; the cumbersome nature of the large sails when suddenly lowered in a squall, or when furled in port; the going aloft frequently to furl gaff-topsails, or to shift them over stays and halyards; the chance of fouling the peak-halyards when furling the gaff-topsails, and the certain chafing and wearing of these sails when furled at sea—these are the most obvious and generally recognized disadvantages under which our coasting schooners labour.

Taking the list in the order as given, I get over these grave faults by having the sails in much smaller sheets; the lower staysails of No. 1 or 2 canvas, the topmast staysails of No. 3 or 4, and so on, according to the size of the vessel. There are no very large patent blocks, no gaffs except to the mizen. All the sails, except the mizen, may be jibed by a sudden shift of wind, or by careless steering, or altering the course to clear a vessel, etc., without any risk to spars or sails. Reefing will be very seldom necessary, except to the mizen, and this sail will be much smaller than usual. The lower staysails have bonnets, but it will be only in hard gales that these are to be removed. In a lull during a gale, when under short

sail, say two-reefed mizen, fore and main staysails, with bonnets off, and jib with bonnet off, if it be desirable to steady the vessel, the topmast staysails may be set low down on their rospective masts, and be carried with some chance of getting them in again in the usual event of a sudden increase of wind. This is a *very important* feature of the new rig—the masts being supported by several stays low down, similar to the stays of a ship, may be several inches less in diameter, and several feet shorter, hence cheaper, less wear and tear, and more easily replaced when sprung; besides which, the sails are so arranged that the carrying away or springing a mast does not wholly disable it, as in the present rig; each sail sets independently of all others, except the mizen gaff-topsail, consequently they must set much better. There is no slatting about of gaffs, except the mizen, and this mast being further aft than usual, and the sail much smaller, it will be easily managed; the foremast will also be a little further forward than usual, reducing the size of the main jib, and consequently increasing the amount of canvas between the masts, where, as every seaman knows, it is more effective as a propelling power, and more easily handled. As schooner yachts are now generally rigged, much of the canvas in the mainsail and main jib is far beyond the extremities, and the boom foresail, in the body of the vessel, by reason, generally, of its bad setting, is the *least effective sail in the vessel*, when close-hauled, in proportion to the amount of canvas in it.

All or any of my sails can be allowed to come down "by the run," without damage to spars or sails, the mizen excepted, and without materially lumbering the deck, as is the case in letting run the present sails. It is true, this is seldom done, on account of the danger, but in short-handed coasters it is very desirable to be able to "carry on" to the last, knowing that a sudden collapse of nearly all the canvas can be effected without danger to spars or sails, and in port all my sails come down to the masts, leaving their booms ready to serve as cargo derricks. The "gaff-topsails," so called for want of a better name, come to the deck, but they may be stowed aloft, if preferred, as usual, and be free from fouling any halyards. I have thus balanced the account, new *versus* old rig; but I may put to the credit of the former account the further valuable facts. Besides the considerable economy in the size of masts, size of blocks and sails, wear and tear, etc., my lower sails being the only heavy ones, the aggregate cost will be less; but this will, in some measure, be balanced by the fact that I get eight or ten per cent. more canvas on my vessel, so that the actual cost of canvas will be nearly the same.

But my canvas, my masts, my hull, and last, not least, my crew, will be more durable, and vessels rigged after my plan will have the preference with seamen and with underwriters—perhaps I should say "ought to have the preference with underwriters at a lower premium." It is a notorious fact that underwriters, as a class, are blind to labour-saving, life-saving, and damage-saving inventions; they rather discourage new and valuable improvements on the ground that if ships are made perfectly safe they will have to shut up shop.

Having stated what I conceive to be the disadvantages of the old rig, and the advantages over it of my new rig, I must go a little into detail, in the absence of illustrations, in order that the seaman may understand clearly the *modus operandi* of the rig. I have between the masts of a three-masted vessel a fixed main-stay and a fixed mizen-stay—they go from the hounds or tressle-trees to the mast forward of them, and set up to about say 15 or 18 feet above deck. Below these stays are others, which travel up and down the lower masts, by means of a stout metal hoop on the after end, below the tressle trees, and on the forward part by a similar hoop and by several wooden hoops attached to the luff of the sail, so that by slacking down the stay-tricing tackles the sail comes down bodily far enough to remove the bonnets; after which it may be set low down, or higher up, out of the way of heavy seas. I may here note that the usual sail, when reefed in a gale, being attached to the boom, cannot very well be set high up out of the way of the sea, and where it will draw well.

There are also fixed topmast stays, going from the topmast, as usual, to any convenient point near the cross trees, and below these fixed stays are the travelling stays, on which the large stay-sails set; these stays travel like the lower staysail stays—that is to say, by means of a tricing tackle and hoops, so that the sail may be set at any point on the topmast between the lower cap and the fixed stay, and on the lower mast anywhere between the lower stay band and the cross trees—for instance, suppose the bonnets to be off the lower staysails, and it becomes expedient to set the topmast staysail, to steady the vessel, it may be set low down on the topmast and the lowermast, and thus be carried in a very strong breeze. All the staysails must have sheets leading down on both sides, also the "gaff-topsails," and these must be attended in tacking. In the present rig, in smooth water, there is nothing to be done save shifting the gaff-topsails and tending the travelling jib-sheet. In the new rig, the two topmast staysail sheets and the two gaff topsail sheets must be hauled over. Considering the necessity, in the

present rig, for going aloft to shift over the gaff-topsails—a duty seldom performed in short tacks—and the greater utility of my new sails, the balance of work is in favour of my new rig.

Some seamen, looking at the plans, suggest that my new rig will not be so good going before the wind—that I cannot "wing-out" as is done in the ordinary rig. There is something in this—not much—because these large schooners seldom or never sail directly before the wind at sea in open water, and in narrow waters, where they must sometimes go dead before the wind, they have to lower their fore and main gaff-topsails, and frequently their very large mizen, on account of the danger of jibing. I have a very convenient squaresail, the yard of which travels on a heavy rod attached to the foremast, above the fixed stay band, so that when not in use it stows up and down the foremast, out of the way of everything. Taking all things into consideration, I am not prepared to admit that my new rig is not *as good* as the old one dead before the wind, and I believe it to be very *much superior* to it under all other circumstances—especially in first cost, durability, safety, and general economy.

I recommend the rig particularly for yachts where quick manœuvring and the ability to carry more sail in the body of the vessel are very important points. In looking carefully at the yachts of the New York and Boston clubs at sea, I have been struck with the fact that the sail they carry on the wind between their masts does not set as it ought to do. Any one desiring to adopt the new rig first may have it free of patent fee, and may be sure of my co-operation in arranging the details. Any further explanations, with plans in detail, may be obtained at No. 42, Court Street, Boston, Massachusetts, on application to R. B. Forbes.

GREENWICH HOSPITAL.

What *is* to be done with Greenwich Hospital? is a question that is becoming more and more urgent day by day, and almost day by day do we see some allusion to it in our daily press; still not a whisper "comes o'er the waters" in reply, and the great magnificent building stands in its widowhood, desolate and melancholy, with no one to care for it beyond the half-dozen policemen who doze at its gates. Surely the Right Honourable member for the borough, of which the Hospital has been the pride,

should know something of what could and should be done for his constituents, and in his capacity as Prime Minister he ought to be able to state something more than that "he should regard it as a reproach if they were not able in a reasonable time to arrive at some satisfactory means of making use of the building." But, we would ask, what is a reasonable time? Surely the period which has elapsed since the last batch of old pensioners were carted away is a reasonable,—or to us an unreasonable—time to find some use for the building.

We cannot but believe it was the intention of the late First Lord of the Admiralty to remove the establishment of the Royal Naval College at Portsmouth to the vacant building, and we believe he would have done so on his individual responsibility, as he did not stand on trifles when he had once made up his mind, in proof of which we can point to the now almost empty Somerset House, but there were grave responsibilities to be considered in the case of the Royal Naval College that did not bear on Somerset House; all the clerks of the latter might have been turned into the streets, and there would have been no voice to plead for them; but Portsmouth returns two members to the House of Commons, and to directly offend an important constituency (for that constituency was up in arms at the idea of parting with the establishment in question) was not to be thought of. As the responsibility was not to be taken by the Government, it became necessary to place it on the shoulders of others; accordingly, the Committee on the "Higher education of Naval Officers" was nominated, and one of the questions they were directed to consider and enquire into was this very question of the removal of the Royal Naval College establishment to Greenwich. Unfortunately the decision of the Committee was adverse to the ideas of the First Lord, inasmuch as one-half of their numbers (and those naval officers) were against the removal; and although the numbers were equal, those that were in favour of the removal were not powerful enough to carry their point.

Now, although we cannot but feel a deep interest in Portsmouth as the great naval arsenal of our southern coast, considerations of an Imperial character affecting the welfare of the Royal Navy as a whole, are paramount; and although we know we shall fail to please some of our readers in candidly expressing our opinion, we do not hesitate to say we believe it would be for the benefit and welfare of the Service if Greenwich Hospital were utilised for the purpose of a great Naval educational establishment, and the present Royal Naval College removed as part and parcel of it.

It is admitted that the College at Portsmouth is totally unsuited

and inadequate for the purpose to which it is applied. The want of accommodation obliges some officers to reside outside the gates; and anyone who has seen the wretched dog-holes of cabins in which officers are literally stowed away, and the absence of all convenience for quiet study, can only feel surprise that such a state of things could have existed so long.

It has been urged, as a reason for non-removal, that the advantages of the adjacent dockyard are very great. There, it is said, every part of a ship's fitments are continually being constructed and fitted, and the facilities for practical instruction are very numerous and most advantageous, but they could not be made available if the establishment were removed to Greenwich. We do not altogether agree with this view. It might as well be said that the officers and men in the *Excellent* could not learn gunnery because they are separated from a cannon foundry, or because they have not the opportunity of observing the new mode of building, boring, and finishing guns. If a return were made of the number of officers attached to the Royal Naval College who in the last year have visited the workshops of Portsmouth Dockyard for the purpose of gaining knowledge, and what person or persons attended to afford instruction, we believe the fallacy of such an argument would at once be exposed. We do not say that a person cannot learn something in seeing a blacksmith weld two pieces of iron together, but it is quite another thing to learn how it should properly be done, or what the object of the work is. Besides, the chief objection made to the state of education in the officers of the Navy is, that the theoretical element wants developing rather than the practical: mathematics are at a terrible discount; languages, chemistry, the principles of naval architecture, and marine engineering are wanting, and without some better system of instruction they will still be wanting. We desire to see our young naval officers submitted to such a training as will make them most effective, and we insist on the necessity of their being highly educated in the theory, as well as practice of everything connected with their profession. But in no case would we have one sacrificed to the other.

There are always two classes of students in all such establishments as the Royal Naval College, viz.: those who go there to work, and those that go to play; the former go with the honest intention of studying, and are anxious not only to make the most of the time devoted to instruction, but if the means are afforded them, of utilising their spare time to the same purpose. The other class is composed of idle men who get appointed more with a view

of passing away time pleasantly, of having a good mess and companionship. They do not entirely neglect study, but only pursue it in that languid, don't-care way that will just enable them to pass a certain test on leaving. Now we affirm that the College at Portsmouth is fit for neither the one nor the other of these classes of students. As regards the workers there is not a sufficiency of instructors to afford them the necessary aid, and there is not accommodation for private study. In truth there are not means by which even with a sufficiency of instructors and every facility for study, a young man could work at some of the most important theoretical and practical subjects of his profession. For the former a much more extensive library, especially in works of reference, is needed; and as to the latter, he has not the means of observing a star crossing the meridian, nor of occultations of the stars or planets; and not until this very time has he had the opportunity of attaining a knowledge of practical marine surveying, be his wish to attain that knowledge ever so great.* Now what would be the case with that young man at Greenwich? Instead of being obliged to descend to take instruction at so much per hour from a hall-porter's son, he would have every means at his command for going as deeply into the sciences as his heart could desire. He would be independent of the mere crammer by being enabled to attend the lectures of the highest intelligences of the day, the facilities for attending which could be afforded at a small cost. Again, the Hospital would afford accommodation not only for a comfortable sleeping room, but also for rooms for study and a library suitable to such an establishment.

Although we do not lay much stress on the advantages to be derived from being near to the Royal Observatory, it would no doubt be highly beneficial to the students; as a course of lectures could be established, and a small observatory fitted under the direction of the Astronomer Royal himself. We have been somewhat struck with the fact that a Russian lieutenant, with whom we were acquainted, has had every facility afforded him by our Government to learn all connected with the Royal Observatory, whilst the officers of our own Navy who have ever been inside the building could be numbered on our fingers.

If we return to the less studious (and we know there are physical as well as other causes that prevent all being eager students alike), they would not have less facilities of getting through their pre-

* An officer from the surveying service is now appointed to afford this instruction.

scribed quota of study than heretofore, and for their hours of leisure and pastime there are many elevating ways of getting through an evening in London that can never offer themselves at Portsmouth. We all know that a young man seeking after pleasure, can always find it, but a fifth-rate theatre and the slums of Portsea and Portsmouth, are not the spots where we would like our sons to seek their pleasures. It may be said, that London is worse by far in this respect, but it is often for the very want of those refined and refining pleasures which abound in London, but must necessarily be rare at Portsmouth, that a young man is obliged to descend to more debasing pursuits.

With regard to the practical knowledge of steam, gunnery, and naval architecture, we at once acknowledge that the Hospital could not be turned into an engine factory, nor could 600-pounders be fired across to the Isle of Dogs. Iron ship building on the premises is also out of the question: but is there not a vast deal in connection with these subjects that requires theoretical study? and in conjunction with all the models which could be brought together to form a working museum, could not much more be learned at Greenwich, and in a better way, than at Portsmouth? With regard to gunnery, it would be very strange if room could not be found in the river for a vessel in which all the routine of gun exercise and the gun drill might be learned, in all but firing, as well as on board the *Excellent*. The college might then do for a residence for those who, having completed their theoretical course at Greenwich, might desire to practically apply their newly acquired theories.

The engineers are without a doubt an increasingly useful body of officers; and the advantage to the service of raising the status, not only in education, but in society, of this class, is most important to the well-being of the service. It may be absolutely necessary for these officers that in order to acquire a thorough knowledge of the various parts of an engine, of the strength of material, fitting, and so forth, they must do much actual manual labour; but there is no more reason why they should not be gentlemen in the true sense of the word, than that an officer of any other grade should cease to be one, from the fact of his having to work with seamen and marines at a gun or on a yard. To raise the standard of this class of officers, encouragement must be given to the right kind of men to enter the profession when young, and the education to fit them for that profession must be in accordance. These remarks are made without the slightest intention of depreciating the gentlemen who now compose the class of engineers in the Navy, although we believe they would acknowledge that for their own sons they would prefer

a higher class education than they had themselves. We would wish them to see that our desire is to elevate, in more ways than one, the whole profession, and (again without any invidious meaning) to be as superior to the present class as the present class is to the first rough and ready men that were our first engineers in the Navy. And in what better way could this be done than by giving them a good theoretical education to begin with, and what place would be more suited for a school of engineering than this Royal building at Greenwich? For the practical manual part that is required, there is ample space for a model factory; and for larger works, the dockyard at Chatham is not far distant, and the great factories that are continually constructing first class engines on all principles for both the Royal and merchant navies are close at hand.

We have before alluded to the advantage of having models to aid theoretical study, and for this purpose we would suggest the transfer of all the models of ships, engines, naval guns and their mountings, anchors, etc., with the records of their performances, to Greenwich, all being brought together and arranged for the purpose of exhibition and study. What place more fitting for a naval museum could there be than the building so many years associated with the Navy? We do not believe it would be less convenient to the general public who wish to see them than at present. South Kensington is practically as distant from the centre of London as Greenwich, besides which, all the models of objects connected with the Navy are not at South Kensington, and the concentration would render them, as a whole, of far more value and importance than they can be in their now widely separated state.

Finally, we turn to the youngsters who are to form our future Nelsons, and although it may seem contradictory to an article contributed in an early number of this series of the *Nautical Magazine*, we advocate the education of the lad, on his first entry, at Greenwich. We consider that the education should be more progressive, for if a higher class of education is to be attained by officers in the navy generally, it must begin with the boy, and they must undergo a longer course of theoretical teaching than at present. If they commence at the age they are at present entered at, viz., twelve to thirteen (although we believe this is too young), at least two years should be spent in a school on shore, during which time, the same facilities could be given them for learning every part of a seaman's duty in knotting, splicing, rigging, and other practical matters relating to a ship as is now afforded to the boys of the Royal Hospital

school, and the practical working of a ship would be comparatively easy on being transferred to the training ship for the purpose.

We fully believe the future of Greenwich Hospital will be educational, the purpose for which it was founded has ceased for ever. Never will the old men, who volunteered (?) to go out, be brought back again, and one of our glories has thereby departed; but cannot another glory, like a Phœnix from its ashes, rise that shall eclipse the old and departed? and what more glorious object could there be to the first Naval nation in the world than to have an unrivalled educational establishment for its officers that should be the envy of, and model for, other nations. Such an establishment is possible, and could be put into working order at but comparatively small expense. The building is ready, and that building is Greenwich Hospital.

[The foregoing article was in type before Mr. E. J. Reed's letter in the "*Times*" of the 20th ultimo, on "The proposed Naval University," appeared. The striking similarity of the opinions expressed, both in Mr. Reed's letter and in the "*Times*'" leading article, with those of our contributor, renders this explanation necessary. Ed. *N. M.*]

YACHTING.

The principal event of *our* yachting month is of a personal nature. Since last we had the honour of filling a few of the pages of the *Nautical Magazine* with a rough description of the most recent circumstances of importance in the yachting world, America has spoken —to us, even to us individually, by means of a communication from a "Devoted Yachtsman" to the *Spirit of the Times*. Mr. George Wilkes, the editor, is a rather neat specimen of what is understood in their country as a rowdy writer; but Mr. George Wilkes's pet contributor, "Devoted Yachtsman," is a neater—and we might say, rowdier. Jack excels his master very considerably. Each displays a proper amount of contempt for the laws, clearly understood if never codified, affecting British journalism: and both are "national enough to break away from the slavish deference, too common among us, to English grammar and orthography." Since his first eccentric gyration to his last farewell—"a long farewell to all his

greatness"—pronounced with becoming dignity the other day (slow music and lights half down), "Devoted Yachtsman" has never ceased to be amusing. His most conspicuous fault, from an English point of view a grievous one, was his long-windedness. The entertaining creature never knew when to stop. And yet this unwillingness to relinquish the society of his readers was natural. He is a man of one belief—himself, and in accordance with his creed went on spinning and spinning yarns of unmerciful length, religiously persuaded that the yachtsmen of America and Great Britain were regarding the growth of the worthless cocoon with rapt attention. Let us not be misunderstood. His capacity to cover acres of paper was *not* amusing. In a country where there is a superabundance of raw material called Brag, and whose most marvellous machine is the glib tongue of the Lyceum Lecturer, "Devoted Yachtsman's" rigmarole cannot but be considered uncommonly diverting. No, his main strength, at any rate the element in his writing which has always provoked *our* admiration and smiles, was his humour. One tired of it, it is true, just as one might weary of listening to an exchange of compliments between a cabman and an omnibus conductor—the wordy warfare of a pair of Newcastle keelmen—or the ornate colloquialism of an inebriate bargee; but it was high art nevertheless. That the *Spirit of the Times* should have fostered and praised such a writer was not surprising.

The readers of the *Bungtown Copper and Comprehensive Tocsin*—we beg pardon, the *Spirit of the Times*, had a right to consider "Devoted Yachtsman" in the light of a marvel—as the "Junius" of the yachting world,—to find his letters "full of humour, boisterous, but delicate—of wit withering and scorching, yet combined with a pathos cool as morning dew,—of satire ponderous as the mace of Richard, yet keen as the scymitar of Saladin,"—to regard his contributions to the literature of yachting as "a work to which the proud genius of the country, standing with one foot on the Aroostook and the other on the Rio Grande, and holding up the star-spangled banner, amid the wreck of matter and the crash of worlds, might point with bewildering scorn to the punier efforts of enslaved Europe." It irks us greatly to think that we have incurred the resentment of "Devoted Yachtsman." Praise from *such* a man, etc. In a moment of mild content, we expressed our satisfaction at the resolution which the New York Yacht Club, accepting the "ruling" of Mr. Schuyler, had come to with regard to the match between Mr. Ashbury's *Livonia* and the representative of the aforesaid club for the cup won by the *America* in 1851. It seemed a safe thing to follow the lead of the club and of Mr.

Schuyler, to say the least of it, let the equity of the decision be what it might. But you never know when you have those Yankees. Our charming friend "Devoted Yachtsman" pounced. "A Britisher" had dared to say that the breach—or difference—between Mr. Ashbury and the New York Club had come to a satisfactory settlement—that was the head and front of our offending. "*Satisfactory* settlement,"—and according to the laws of New York journalism in such case made and provided, the Britisher must have it. Whereupon he "had it." We were wrong, and a certain musty old proverb is right; you cannot touch pitch without being defiled. Anglo-American matches, Mr. Ashbury's squabbles with the New York Club, the brag and "choice American" of "Devoted Yachtsman," *ought* to be let alone. We admit it. Forgive us for offending this once, and we promise never to do so again.

Taking up our narrative of the closing matches of the season where we were obliged to leave off last month, we find the finish of the Royal Albert Club has yet to be dealt with. For the Commodore's Cup, sailed on the Friday in unequal but on the whole not disagreeable weather, there was a capital entry; and notwithstanding a stiff wind from the S.S.W., a fleet of eight appeared on the station to await the signal to start. The *Livonia*, whose owner might fairly be supposed to be anxious for as many public trials as possible prior to his departure for America, was at the head of the list as regards tonnage. Next to her was the cutter *Oimara*, and third in that respect the schooner *Harlequin;* the bottom of the list being occupied by the 40-ton cutter *Muriel*. The first point, the Warner Light, was first weathered by the *Muriel;* the *Livonia*, *Oimara*, and *Wildfire* bringing up the rear in the order we have mentioned them. From that point pretty well up to the finish, the *Livonia* and *Oimara* were substantially at the head of affairs, the schooner during something like one half the voyage and the cutter the remainder. They had started at 11.3 and at 5 h. 31 min. 28 sec. the *Oimara* reached home, the *Livonia* next at 5 h. 45 min. 48 sec., Col. Markham's *Harlequin* 5 h. 12 min., Mr. J. Turner Turner's *Wildfire* (schooner 59 tons) 6 h. 0 min. 36 s. next, and *Muriel* 6 h. 2 min. 50 sec. last. The *Garrion* was about two minutes astern of the *Livonia*, but did not pass the mark-boat, as she got aground off Southsea Castle. The *Oimara* saved her time off all excepting the *Wildfire*, to which she had to allow 33 min. 25 sec., so Mr. Turner Turner's schooner was declared winner of the cup. The match for the Town Cups, which was sailed on the Saturday was remarkable for exhibiting the *Livonia* in a better aspect than ever. She is by no means the flyer we

expected she would be, but there is no doubt of her sterling qualities and behaviour in a stiff breeze. Although it has been decided that she has to sail against a single representative of the American fleet, instead of the whole of the racing yachts at the other side of the Atlantic, we feel assured that, under the old conditions—as understood by "Devoted Yachtsman"—she would have defeated more than could have defeated her. However, "let that flea stick fast to the wa'." The dozen yachts that were content with the conditions were started at 11 a.m. to the second, and the nine that finished passed the mark-boat thus:—*Oimara* 4 h. 40 m. 3 s., *Livonia* 4 h. 46 m. 7 s., *Garrion* 4 h. 51 m. 8s., *Vanguard* 4 h. 54 m. 1 s., *Volante* 5 h. 5 m. 13 s., *Harlequin* 5 h. 5 m. 29 s., *Hirondelle* 5 h. 9 m. 25 s., *Enid* 5 h. 10 min. 57 s., and *Alcyone* 5 h. 12 min. 42 s. The cutters sailing against schooners added half their tonnage; yawls sailing against schooners added one-third of their tonnage; and yawls sailing against cutters deducted one third. The *Oimara* saved her time on all excepting the *Vanguard*, and, as neither of the others saved her time on the *Vanguard* that cutter won; but the *Field* shrewdly points out that a nice complication might have ensued out of this adding and deducting tonnage. Thus the *Harlequin* might have saved her time of 23 m. 10 s. from the *Oimara*, with a minute to spare, but, as she had to allow the *Vanguard* 2 m. 30 s., and only beat her 1 m. 30 sec., she could not take the prize; and the *Vanguard* could not take it because she had not saved her time, 19 m. 50 s. from the *Oimara*. The question would be in such a probable case: "Which vessel would be entitled to the prize?" The owner of the *Hirondelle* entered a protest against the *Enid's* taking the prize, on the ground that she had passed the wrong side of the Norman Fort in the last round. The sailing committee decided against the *Enid*, but awarded the prize to the *Harlequin*, that vessel being the next in order to save her time. The *Hirondelle* had not saved her time, but it should be stated that she lost a deal of ground by carrying away her spinnaker boom in the last round.

About this time two matches took place in connection with the Clyde Yacht Club, but as they were only of passing interest, we do not propose to make any detailed reference to them. At the Torbay Royal Regatta the £60 cup was won by the *Oimara*, and the second prize of £15 by the *Vanguard*. The sailing of the five competitors was of a common place character. At the same regatta the cup of £20 for cutters of 20 tons and under was won by Mr. T. Cuthbert's *Vampire* (20 tons): Mr. C. Codrington's *Lizzie* (20 tons) taking second prize. It was a close and exciting

race. The £10 cup for yachts of 9 tons and under brought out but two competitors, and of these Mr. D. Wern's *Zephyr* may be said to have almost walked over, owing to an accident happening to the *Lapwing*. It was found impossible on the second day to bring the match for the £100 prize to a successful conclusion, but on Friday the race was sailed and the prize won by the *Flying Cloud*, the *Enid* being second, and the *Anita* third; the *Tartar* carried away her top-mast. For the £40 cutter prize the yachts came in in the following order: *Dione*, *Niobe*, *Alcyone*, *Foxhound*, *Glance*, and *Kilmeny*. For the £30 prize the *Wild Duck* came in first, and the *Gondola* second.

A group of comparatively uninteresting events which occurred about this time may be disposed of in a summary manner. The third race of the Temple Yacht Club was won by Mr. T. W. Thompson's *Ethel*. The second match of the Junior Thames, held on the 24th of August, was won (first class, for yachts above 7 tons and not above 15 tons) by Mr. J. A Sparved-Bayly's *Echo*, 11 tons, and (second class, for yachts not above 7 tons) by Mr. F. Brown's *Marguerite*, 6½ tons. Owing to severe weather the yachting which was to have been a distinguishing feature of the Inverary festivities ended in a *fiasco*, to which special reference need not be made. There was some good sailing at Dartmouth regatta, and the sailing committee, one of the most energetic and business-like on the coast, are to be congratulated on the success which attended their efforts. The schooner and yawl match was easily won by the *Enid* yawl (Mr. G. Putland, 56 tons), Mr. H. Studdy's schooner *Anita*, 47 tons, finishing second. These yachts sailed as 42 and 29-tonners respectively. The *Lizzie* won the Mayor's Cup, the *Thought* taking second prize. On the second day of the regatta the first prize for cutters above 30 tons fell on the time allowance to the *Niobe*, the *Vanguard* taking the £5 awarded to the second in the match. On the same day the *Lizzie* won her fifteenth prize this season, the Luttrell Cup, Mr. T. Liscombe's *Luna* finishing second. Teignmouth regatta was revived after a lapse of four years under circumstances of an encouraging description. The *Lizzie* again won—her fourteenth first prize,—and the other prizes, minor ones, were taken by Captain Bayley's *Buccaneer* (14 tons), Mr. E. Langtree's *Ildegonda*, the same tonnage, running second,—and Mr. H. H. Spencer's *Hirondelle*, 11 tons, respectively.

On the conclusion of the Dart Yacht Club regatta, an ocean race was sailed from Dartmouth to Falmouth. There were seven competitors, and the *trio* that arrived first were the *Garrion* 3 h. 19 m. 50 s., *Anita* 3 h. 30 m. 39 s., and the *Condor* 3 h. 41 m. 53 s. On the time arrangement the prize fell to the *Anita* (47 tons, Mr.

Studdy). It was from first to last a most uninteresting match. This inauspicious commencement to the Royal Cornwall regatta was followed, on the Monday, by the match for Her Majesty's Cup, which brought out the following well-known yachts:—*Oimara*, *Condor*, *Garrion*, *Vanguard*, and *Niobe*. After a splendid race, during which the *Condor* carried away her topmast, the *Vanguard* won with 9 m. 29 s. to spare; the finish being thus: *Oimara* 5 h. 30 m. 20 s., *Vanguard* 5 h. 45 m. 15 s., and *Garrion* 5 h. 45 m. 50 s. This makes about £1000 which Mr. W. Turner's "flyer" has won during the season. The match for yawls not exceeding 20 tons was won by Captain Studdy's *Gondola* (18 tons) by time. The Regatta of the Royal Western Club proved to be a tame affair, notwithstanding the beauty and value of the principal prize, and the personal popularity of the commodore. There were but four entries for the cup given by Earl Vane, and Count Batthyany's *Flying Cloud* was the winner; Lord H. Lennox's yawl *Hirondelle* taking the second prize of £25. The flying *Foxhound* won the £50 for cutters and yawls, on the time allowance; the like allowance depriving the *Oimara*—which came in first—of second money, and giving it to the *Alcyone*. The *Dudu* won the cup for yachts of 10 tons and not exceeding 20. The Clyde Club closed its season, one of gratifying success, with a Corinthian match, which served to bring out the seamanship of the amateur crew of the cutter *Avon* in a most striking manner. This is how the reporter describes it:—"The gusts off the land were strengthening, and, with a shower threatening, the balloon foresail was again stowed, and working foresail set. Weathering the schooner *Nyanza*, the *Avon* presented a fine sight to the schooner's crew crowding the rail while she tore past in a cloud of foam. The Skelmorlie Buoy, a point or two to leeward, had to be hauled round, and, with the wind coming more astern, all hands were called to the sheet for a gybe. Half a dozen Corinthians 'tailed on,' and, with a pull altogether, the mainsail with gaff topsail over it were flattened. Another pull was wanted, and the crew gave it. The boom was only off enough to sail the cutter close-hauled, when a spindrift squall came off the land, caught the mainsail on the lee side, and brought over the boom with a tremendous surge. The cutter lurched right in to the mast, sending the lee rail into the sea, through which the *Avon* must have been running some ten miles an hour. The boom went with a crash like a gun, within eighteen inches of the mast, the gaff broke across at the jaws, and the topsail yard where the halyards were seized. With the yacht on her beam ends, the spars breaking the canvas in a wreck to leeward, the surge running like the race

from a steamer's wake, there was extreme danger to the crew. The sea swept over those at the sheet, nearly carrying Mr. Sword over the rail. The others were clinging on, up to the waist in water. Mr. Walker's son, at the lee backstay, was swept over the side by the broken boom, but fortunately caught the rigging and was saved. A sudden relief was felt when no one was hurt or over the side. The serious damage done hardly troubled the owner when his friends were all safe on deck. The *Avon* righted, but presented a sad spectacle. The broken boom, a splendid spar, lay over the lee rail, the broken gaff hung across the mast, the gaff-topsail yard hung in halves, the crosstrees were smashed, the running rigging, adrift, blew about in a perfect hurricane of wind and rain. The jib, lowered quickly to save the mast, got under the *Avon's* fore foot. With a lead of four miles, likely to be increased in the turn to windward, the prize already secured was lost." The *Lelia* (cutter, 29 tons, Mr. Ferguson) came in first, and notwithstanding a time allowance to the *Phantom* (27 tons) was second, won.

The Tyne schooner has just been purchased by Colonel Talbot Clifton, and he is having her fitted out at once. The *Belladonna*, Mr. Schneider, and the *Lufra*, the Earl of Strafford, have gone into harbour, to lay up. Ratsey has launched from his yard a smart little cutter of 55 tons, which he has built for M. Benoit Champy. Her name is to be the *Diamantè*. Her dimensions are: length between the perpendiculars, 63ft.; beam, 14ft.; draught of water aft, 10ft. 6in.; ditto forward, 7ft. The Cowes builder is going to lay down a cutter of 105 tons for Count Edmund Batthyany, the owner of the celebrated *Flying Cloud;* she is intended for racing.

OUR NAVAL SUPREMACY.

It is a remarkable sign of the times that public feeling in England has been very much taken up of late by introspection. In many ways we have been looking into our national position, and taking ourselves to task for faults real or imaginary, which seem to threaten the welfare and progress of our country. Not only have speculative alarmists put forth inflammatory pamphlets on the subject, but the British public have with unusual eagerness seized

upon these pamphlets, devoured their contents with avidity, and allowed them to strengthen those latent fears which for some time past have been culminating to development.

Especially has England's maritime supremacy been the subject of alarm in men's minds. Sundry causes have operated to shake the nation's confidence in our naval resources, but none have had so serious an effect as the startling series of disasters which have recently befallen the Royal Navy. However much of the purely accidental element there may have been in these casualties, there was also undoubtedly a very large proportion of culpable human negligence or ignorance. It is this negligence, born of half-heartedness, which is so sad for Englishmen to contemplate. The vigour and thoroughness inspired by patriotic fire, which made our seamen the wonder and terror of the world, seldom shew themselves in these days: either opportunities or encouragement are wanting, possibly it is found not to be a paying game—glory and honour may go to the winds so long as more solid advantages take their place. We are loth to think such is the case, but how else can we account for the apathy and the non-appearance of that glorious enthusiasm, which in times past held men above the sordid greed of gain, and led them on by noble impulses to merge their private interests into those of the country.

It is of little use wailing and weeping over a day that is dead; we shall do much better to bring a calm judgment to the examination of our position and our short comings. Empty regrets are always vain, they waste precious time, and induce a morbid sentimentalism which is fatal to successful action.

As regards our mercantile marine, the leading article of this number of our journal shews conclusively that there is not much cause for alarm in that quarter. The facts speak for themselves, and are sufficient to quiet the most uneasy minds. But facts are not so gratifying as regards our Imperial Navy; we confess that we cannot see that England has made anything like the progress in her naval armaments as she has in her commercial marine. At present we have so many natural advantages that our would-be rivals have not been able to overtake us in the race for ocean supremacy; but we would impress on our readers, and on all who desire that England should continue to maintain her naval superiority, that there are unmistakeable signs that other countries are steadily gaining on us. Germany is making the most of her limited seaboard; splendid ships of war are rapidly being constructed under the superintendence of experienced Englishmen. She has actually outbid us in our own market. As may be seen on

reference to our August number, officers and seamen for her growing navy are being trained in a manner which leaves little doubt as to the ultimate results which will be attained.

Russia is certainly gaining ground as a maritime power. Not only are her shipbuilding yards busy with the construction of new vessels, both for naval and mercantile purposes, but we are told that she has been "working away in the far East with a success in annexing territory that seems well-nigh incredible." The result of this we read is that, "the Russian coast on the Pacific now reaches from Behring's Straits in latitude 65°, to the Corea in latitude 42°, a distance of 1,600 miles on the meridian, with more than 5,000 miles of shore line. This territory is no mere barren tract of land, for it contains great commercial, manufacturing, and agricultural resources, and will probably at some future date occupy an important place in the business of the Pacific hemisphere. In addition to this it is said that the Czar has his eye on the Corea itself, and if he should obtain this it will extend his Pacific frontage down to 35°, and give immense increase to the value of his Asiatic possessions.

The Turks, who have the credit with us of being so inactive in national undertakings, shew that at least in naval matters they are not laggards. They possess some really magnificent ironclads, all of which were built in England. The recent agitation in reference to the neutralisation of the Black Sea has given a marked impetus to the development of naval power both in Turkey and Russia.

Of course the Americans are not idle. They are straining every nerve to place themselves in a position which will enable them to hold their own against the Britishers, and with their enormous resources and natural advantages, combined with their personal energy, we must not shut our eyes to the probable result of determined efforts in that direction.

Even the Italians are not asleep, although they may seem to be very quiet. We might almost believe that the spirit of the Venetian and Genoese mariners was still alive among them after reading the account of the Voyage of the *Principessa Clotilde*. The following extract from a letter from one of the officers of that vessel shew the scope of the expedition.

"As you will have learned from the telegram which I sent you yesterday, the national corvette *Principessa Clotilde* has arrived at this port on her return from a voyage of circumnavigation undertaken forty months ago. I will not give you any minute details of this long voyage. I will confine myself to saying that, according to the statement of the officers, it will be of great advantage to the

future development of our commerce with the distant countries of Japan and the Indies.

"In the first place, we have made these nations acquainted with the name of Italy and its productions. Then, again, the courteous bearing of the ship's officers, and the respect shown by all the sailors for the institutions of the countries and the personal dignity of the inhabitants, have gained us their sympathies, for this respect is not habitual to Europeans, especially the English.

"The two Treaties of Commerce which Captain C. A. Rocchia, the Commander of the *Clotilde*, has been enabled to conclude with the Sovereigns of Siam and Burmah, countries on which Eastern riches are abundantly lavished, will assuredly contribute towards the development of our future commercial relations. It is unnecessary to point out the productions which we shall be able to export from these countries."

What we would urge is, that all these countries are going in for those things by which we have become what we are, and are progressing in the element which Englishmen are apt to think is peculiarly their own. We see all around us the nations moving onward at a tolerably rapid rate, and the fact is borne upon us that if we would retain our pre-eminence we must also be moving on. True we are still foremost as regards commercial activity, but our mercantile ships want protection, and an increase in our merchant navy calls imperatively for an increase in our naval power. Not for one instant would we assert that we are either retrograding or actually standing still, although we know that the "rest and be thankful" spirit has a considerable influence among us; but let us remember that we have vigorous and determined rivals, who will assuredly catch us up and pass us if they can, leaving us to stand wringing our hands and lamenting over our departed glory. Our boasts of Britannia ruling the waves, or being the mistress of the seas, would under such circumstances be a most wretched mockery, and among the nations of the world we should be laughed to scorn. Even now we are told that "England has had her day," and that the Russians, Yankees, and Prussians taunt us and hold us of little weight in the community of nations.

It is a sorrowful duty to have to write these words, but it is the fear of an apathetic spirit stealing upon us and robbing us of our vigour and eventually of our national life, which impels us to make an energetic protest against the tendency which unfortunately prevails to repose in our fancied security and superiority over other powers.

We especially would ask the younger members of the maritime

profession not to rely too much on the established *prestige* of England; it would be, we fear, a broken reed if too implicitly trusted to. Rather we would urge them by their individual energy and enterprise, by that indomitable pluck and perseverance which have gained us our reputation; by that old chivalrous and heroic spirit which we cannot think has died out amongst us, and which has made us respected and feared near and far; to devote their strongest efforts to the maintenance of our honourable and proud position as the chief maritime power in the world.

We would ask our sailors to emulate that spirit which has found so forcible an expression in a recent publication,* a short extract from which is as follows:—

"Russians, Yankees, Prussians, all you
Who stand there scowling at Dover,
'England has had her day'—is that your cry?
Flood and earthquake! it's our cry too!
Had it, had it, a thousand times over!
Yea, and as sure as sky is sky,
And sea is sea, and shore is shore,
You shall see England have one day more!
And such a day shall England have,
That a thousand cities over the wave
Shall wring their bitter hands and say,
'England, England, *has* had her day!'"

We must not lose our position among the nations if England is still to be able to protect her commerce, and to continue to be the foremost in the performance of those functions in all parts of the globe, by means of which civilizing influences have been diffused around, and the progress of the whole race of mankind urged on in a healthy and vigorous manner.

PILOTAGE.

We publish below for the information of our readers the text of two Bye-laws which the Trinity House propose to make on the subject of Pilotage within the district under their control. The former will bring under some authority a class of men who have hitherto enjoyed the privilege of doing as they like, and who have been the cause of much ill-feeling against the properly qualified and licensed

* England's Day; a War-saga: commended to Gortschakoff, Grant, and Bismark, and dedicated to the Royal Navy. London: Strahan and Co., 1871.

pilots; for in the eye of the public any man who pilots a vessel is a pilot, and the good and the good-for-nothing are all looked upon alike, consequently when damage has occurred through the incompetence or mismanagement of an unlicensed man, the whole class of pilots have been condemned, and there has been no way of preventing the incompetent man from acting even the next hour if he can find the master of a vessel to take him.

With regard to the latter proposed Bye-law, it is difficult to understand what good will be gained by any one from it, for in looking along the coast from Boulogne to Brest, there are few places where vessels other than those carrying passengers will trade, and it was absurd to exempt a vessel trading from Falmouth or Plymouth to the Baltic, from being obliged to employ a pilot, while a vessel trading from those ports to Havre was obliged to employ one. It seems that this Bye-law will only increase the evil which was introduced by the framers of the Merchant Shipping Act, 1854; better far would it be for the shipping interest, if all exemptions were abolished, and the rates of Pilotage made so low that it would be to the interest of all owners of vessels to employ a duly qualified Pilot.

Pilotage between Gravesend and London Bridge.

"Whereas, by the 333rd Section of the Merchant Shipping Act, 1854, it is enacted that, subject to the provisions contained in the fifth part of that Act, it shall be lawful for every Pilotage Authority, by Bye-Law made with the consent of Her Majesty in Council, from time to time to do all or any of the following, amongst other things, within its districts; that is to say:—

"To determine the qualification to be required from persons applying to be licensed as Pilots.

"To fix the terms and conditions of granting Licenses to Pilots.

"To fix the rates and prices or other remuneration to be demanded and received for the time being by Pilots licensed by such authority, and to repeal and alter any Bye-Law made in exercise of the above powers, and to make a new Bye-Law or new Bye-Laws in lieu thereof.

"And whereas, under the authority of Orders of Her Majesty in Council, made on the 1st day of May, 1855, and on the 1st day of November, 1862, certain Regulations are now in force in relation to the Licensing of Pilots for general purposes within the London District and the Trinity House Outport Districts, and for fixing the terms and conditions of granting Licenses to such Pilots, and their

rates of remuneration, and other things incident to the licensing of such Pilots: and whereas it is expedient to make further provision for qualifying persons, not otherwise authorised to act as Pilots of Coasting Ships only on the River Thames between London Bridge and Gravesend, and for regulating the terms and conditions on which such persons shall be licensed, and the rates of remuneration to be received by them: And whereas the Corporation of Trinity House of Deptford Strond, being the Pilotage Authority for the district comprised within the limits, are about to submit for the consent of Her Majesty in Council the Regulations (hereunto annexed) for the licensing of persons as Pilots for Coasting Ships within such limits:—

REGULATIONS.

"Any person who shall prove to the satisfaction of the Trinity House that he is a person of good character, and has been accustomed to pilot Coasting Ships on the River Thames between London-bridge and Gravesend, for a period of two years previously, or who shall have previously served an apprenticeship of seven years to a Pilot accustomed to pilot Coasting Ships within the limits aforesaid, shall be deemed qualified, after examination as in the said Act provided, to receive a License to act as a Pilot for the Navigation of Coasting ships up and down the River Thames between London-bridge and Gravesend, subject to the following terms and conditions, viz.:—

"1. Every License so to be granted shall authorise the person to whom it shall be granted to act as Pilot on board of Coasting Ships only, and no others, within the limits aforesaid.

"2. Every person so licensed shall be entitled to receive as a remuneration for his services one-half of the amount of the rates which a Pilot licensed under the regulations already existing would be entitled to receive for the same service if performed by him within the limits aforesaid.

"3. Every person so licensed shall be subject to all bye-laws, rules, orders, and regulations made, or hereafter to be made, by the Trinity House, for the government of Pilots generally, and to all penalties thereby imposed and provided, unless specially exempted therefrom.

"4. Every such person shall on his appointment, and on the annual renewal of his License, pay to the Trinity House the like sums of money as are payable by Pilots licensed for the London District on their appointment, and on the annual renewal of their Licenses, but shall not be required to pay to the Pilots' Fund the

poundage of sixpence in the pound upon the Pilotage earnings of Pilots licensed by the Trinity House, nor shall he or his widow or children be entitled to any benefit from the said Pilots' Fund."

EXTENSION OF EXEMPTIONS FROM COMPULSORY PILOTAGE.

"Whereas, by the 332nd Section of the 'Merchant Shipping Act, 1854,' it is enacted that every Pilotage Authority shall have power by Bye-Law—made with the consent of Her Majesty in Council, to exempt the masters of any ships or of any classes of ships from being compelled to employ qualified Pilots, and to annex any terms or conditions to such exemptions, and to revise and extend any exemptions now existing by virtue of that Act or any other Act of Parliament, Law, or Charter, or by usage, upon such terms and conditions, and in such manner as may appear desirable to such Authority;

"And whereas, by the 379th Section of the said Act, it is enacted that the following ships (among others) when not carrying passengers, shall be exempted from compulsory Pilotage in the London District and the Trinity House Outport Districts (that is to say),

"Ships trading to Boulogne or to any place in Europe North of Boulogne;

"Ships from Guernsey, Jersey, Alderney, Sark, or Man, which are wholly laden with stone, being the produce of those islands.

"And whereas, it is expedient to extend the exemptions contained in the last mentioned Section in manner hereinafter mentioned;

"And whereas, the Trinity House of Deptford Strond being the Pilotage Authority for the said Districts, are about to submit for the consideration of Her Majesty in Council, the following Bye-Law (that is to say),

"That all ships trading from any port or place in Great Britain, within the London District or any of the Trinity House Outport Districts, to the Port of Brest in France, or any port or place in Europe, North and East of Brest, or to the Islands of Guernsey, Jersey, Alderney, Sark, or Man, or from Brest or any port or place in Europe, North and East of Brest, or from the Islands of Guernsey, Jersey, Alderney, Sark, or Man, to any port or place in Great Britain, within either of the said Districts, when not carrying passengers, shall be exempted from compulsory Pilotage within such Districts."

Any objections to either of these proposed changes must be lodged at the Trinity House one calendar month from the date of the notice; the former notice is dated the 8th, and the latter the 25th of September, 1871.

WRECKS, 1870.

THE Board of Trade reports just issued shew that the whole number of wrecks, strandings, casualties, and collisions reported during 1870 is 360 below the average of the last five years. The number of casualties on and near the coasts of the United Kingdom which were attended with loss of life, and the number of lives lost, was—British vessels, 101; lives lost, 676. Foreign vessels, 23; lives lost, 98. Total vessels, 124; total lives lost, 774.

Of the whole of the casualties on and near the coasts of the United Kingdom recorded, the number attended with loss of life, and therefore of a serious character, is not great. Of these casualties about one out of twelve results in loss of life. The number of wrecks, casualties, and collisions reported may probably increase from year to year, owing to the increase in the number of ships frequenting our coasts and narrow adjoining seas, whilst the particular number for any one year will be increased or diminished according to the prevalence or absence of gales of remarkable violence and duration. Few gales of remarkable force occurred during the year 1870, and to this may perhaps be attributable the reduction in the number of wrecks and casualties. The most serious gale of the year commenced on the 12th of October, and during that and the following day 99 wrecks and casualties are reported to have occurred. The direction of the wind during the two days was from S.E. westerly to N.W. The gales of 1870 were chiefly from the following directions, viz.:—January, from S.W. to W.; February, from E.N.E. to S.; March, from N.E. to E. During April no serious gale occurred. In May a gale occurred with the wind from S. to W.S.W. During June and July no serious gales occurred. In September a gale occurred with the wind principally from S.W. to W. The October gales were from N.E. southerly to N.N.W.; November, from S.W. to W.N.W.; and December from E. to S.E. The two latter months are remarkable for the almost entire absence of serious gales. During these two months only sixteen wrecks and casualties are reported to have occurred on or near the coasts of the United Kingdom, with the wind at force 9 and upwards.

The number of ships lost or damaged in the 1,502 wrecks, casualties, and collisions reported as having occurred on and near the coasts of the United Kingdom in 1870 was 1,865, representing a registered tonnage of upwards of 404,000 tons.

The number of ships in 1870 is less than the number in 1869 by 729. The number of ships reported is in excess of the number of casualties reported, because in cases of collision two or more ships are involved in one casualty. Of the 1,865 ships, 1,552 are known to have been ships belonging to Great Britain and its dependencies, with British certificates of registry; and 271 are known to have been ships belonging to foreign countries and states. Of the remaining 42 ships the country and employment are unknown. Of the British registered ships, 1,101 were employed in the British coasting trade, and 451 were employed in the (over-sea) foreign and home trade. Of the ships belonging to foreign countries and states, 14 employed in the British coasting trade met with casualties. Of the total number of wrecks, etc., (1,502) reported as having occurred on and near the coasts of the United Kingdom in 1870, 361 were collisions, and 1,141 were wrecks and casualties other than collisions. Of these 1,141 wrecks, strandings, and casualties other than collisions, 411 were wrecks, etc., resulting in total loss, and 730 were casualties resulting in partial damage more or less serious. The whole number of wrecks and casualties other than collisions on and near our coasts reported in 1869 was 1,653, or 512 more than the number of wrecks, strandings, and casualties other than collisions, in 1870. The annual average in the United Kingdom for fifteen years, including 1870, is for wrecks other than collisions, resulting in total losses, 479; and for casualties resulting in partial damage 719. As against this the numbers for the one year 1870 are for total losses 411, and for partial damage, 730. Of the 411 total losses from causes other than collisions, on and near the coasts of the United Kingdom in 1870, 160 happened when the wind was at force nine or upwards (a strong gale), and are classed as having been caused by stress of weather; 63 arose from defects in the ship or her equipments (and of these 63 no less than 28 appear to have foundered from unseaworthiness), 77 appear from the reports made by the officers on the coasts to have been caused by inattention, carelessness, or neglect; and the remainder appear to have arisen from various other causes. Of the 730 casualties, *i.e.*, cases of partial damage from causes other than collisions, on and near the coasts of the United Kingdom, 350 happened when the wind was at force nine or upwards (a strong gale), and are included as having been caused by stress of weather, 154 arose from carelessness, 74 from defects in the ship or her equipments, and the remainder appear to have arisen from various other causes.

The total number of ships which, according to the facts reported, appear to have foundered or to have been otherwise totally lost on

and near the coasts of the United Kingdom from unseaworthiness, unsound gear, etc., in the last ten years, is 528; and the number of casualties arising from the same causes, during the same period, and resulting in partial damage is 586. In 1870 there were on and near the coasts of the United Kingdom 83 wrecks and casualties to smacks and other fishing vessels. Excluding these 83 fishing vessels, the number of vessels employed in the regular carrying trade that have suffered from wreck or casualty here during the year is 1,782. If this number is again subdivided it will be found that less than half of it is represented by vessels of the collier class, chiefly employed in the coasting trade. For the six years ending 1870, the number is more than half. In the ten years ended 1870, disasters on and near the coasts of the United Kingdom to comparatively new ships bear a very high proportion to the whole number; and during the year 1870, 130 wrecks and casualties happened to nearly new ships, and 307 to ships from three to seven years of age. Then there are wrecks and casualties to 366 ships from seven to fourteen years old, and to 518 from fifteen to thirty years old. Then follow 206 old ships from thirty to fifty years old. Having passed the service of half a century we come to very old ships, viz., 49 between fifty and sixty years old, 20 from sixty to seventy, 4 from seventy to eighty, 5 from eighty to ninety, and 1 upwards of one hundred. The ages of 259 are unknown. Of the 1,865 vessels lost or damaged on or near the coasts of the United Kingdom in 1870, 69 were rigged as ships, 195 were steamships, 481 schooners, 276 brigs, 234 barques, 199 brigantines, and 124 smacks. The remainder were small vessels rigged in various ways. Of the 1,865 vessels referred to, 790 did not exceed 100 tons burden, 659 were from 100 to 300 tons, 304 were from 300 to 600 tons, and 112 only were above 600 tons burden. The greatest number of wrecks occurred on the East Coast. The numbers are as follow:—East Coast, 701; South Coast, 148; West Coast, 412; North and West Coast of Scotland, 46; Irish Coast, 163; Isle of Man, 18; Lundy Island, 6; Scilly Isles, 8. Westerly gales are far more destructive than easterly gales—the most destructive being from south-west.

As regards the loss of life the returns show that the number of lives lost from wrecks, casualties, and collisions on or near the coasts of the United Kingdom in 1870 is 774. This is 159 less than the number in 1869, and less than the number lost in any year since 1865. The lives lost in 1870 were lost in 124 ships; 99 of them were laden vessels, 18 were vessels in ballast, and in 7 cases it is not known whether the vessels were laden or light.

111 of these ships were entirely lost, and 13 sustained partial damage. Of the 774 lives lost, 105 were lost in vessels that foundered, 112 through vessels in collision, and 467 in vessels stranded or cast ashore. The remaining number of lives lost (90) were lost from various causes, such as being washed overboard in heavy seas, by explosions, etc. The greatest loss of life during the ten years ended 1870 occurred in the Irish Sea.

The statistics of wrecks abroad show that the total number of wrecks for the year 1870 is 1,272. The number involving loss of life reported in 1870 was 178, and the number of lives so lost was 2,271, showing an increase of 586 over the number reported in 1869, and 649 over the average for the three years preceding 1870. This increase is to be accounted for by the large number of lives lost in H.M.S. *Captain*, and the steamship *City of Boston*.

LOSS OF H.M.S. MEGÆRA.

We are glad to be relieved from the great doubt respecting the relief of the officers and crew of this ship. By the telegram received at the Admiralty in the early part of the month, we were led to believe that the unfortunate crew had only thirty days' provisions, quarter allowance, and the period at which it was expected the three vessels bound for their relief would reach the island, would leave scant time to the exhaustion of provision: that this happily is not the case the official report will prove, as also will the following extract from a letter which has been received from one of the officers of the *Megæra* by a relative in England:—

"St. Paul's Island, South Indian Ocean,
July 1st, 1871.

"When half-way to Australia, in mid-ocean, more than a thousand miles from land, and it blowing hard, the ship at midnight began to leak. They found holes in her bottom like a teakettle worn from age. We then ran away for this island, 1,500 miles off. God in His mercy sent us a strong wind, and away we went, leaking fearfully. The men could not keep it down, so we used steam-pumps, and even these broke down. At last (ten days after) we reached this island. It came on to blow hard; we lost

all our anchors, and were blown under a huge precipice, and gave up all hope. I put on my life-belt as a last hope; but God intervened just as her bowsprit was touching the rock, and took us off clear. We then went to sea a little, and during a lull ran the ship right on shore in the best place we could, and here we are, thank God, all safe and sound, with everything saved—wines, provisions, clothes, furniture, books, etc. We are all like so many Robinson Crusoes, in huts and tents all over the island. It is pretty in some places, but rather barren. There are fine fish, wild goats, and lobsters are caught by dozens. We have emptied the ship of everything in her. She was rotten throughout, and her bottom worn into holes like a colander. Imagine 350 men in such a ship! The wear and tear, mentally and physically, for the last two weeks has been very great. Merchant vessels sight this island on their way to China, India, and Australia. We saw two yesterday, and nearly caught one in a boat, but it was late in the evening and too dark. We shall send away an officer and men with dispatches in the first one, and then can wait even for men-of-war to come to us from the Cape or Mauritius, or Australia. We have plenty of food, etc., till that time, even for three months, but we hope to stop merchantmen, and to leave by batches of fifty or so in them, so have no more anxiety about the matter."

Next to the safety of the crew, our anxiety will be to know on whose shoulders will rest the blame of sending such an untrustworthy ship on such a voyage, and until this is done the public will not be satisfied. If the blame be brought home to Captain Thrupp, we know what his fate will be; but wherever the fault be found to lie, we shall look for strict justice to be meted out.

We reprint the official reports, but cannot say that we find in them any satisfactory explanation of the disaster.

"Her Britannic Majesty's Acting Consul at Batavia to the Secretary to the Admiralty.

"British Consulate, Batavia,
"August 14th, 1871.

"Sir,—On the 7th inst. I had the honour to send the Board of Admiralty the following telegram:—'In terms of your telegram I have chartered the British steamer *Oberon* for St. Paul's, with provisions, and Lieutenant Jones sails Wednesday morning daylight. Speed ten, perhaps fourteen knots. Capacity 1022 tons. The *Rinaldo* expected Wednesday.' And on the 9th inst. I received your reply as follows:—

"'Approve *Oberon* being chartered. Inform Captain Thrupp, if this reaches you in time, the crews of the *Blanche* and *Rosario* are to be sent to Sydney in the *Malacca* which is to bring relieved crews to Aden, unless already chartered for England. Captain Thrupp to return to Singapore in *Rinaldo* with witnesses required for court-martial, and come thence with them to England in ordinary steamer. Acknowledge this.' From which I am pleased to notice that my arrangements have met with the approval of their lordships.

"The *Oberon* is a fine steamer of 1022 tons register, and will probably make the voyage to St. Paul's under favourable circumstances at an average speed of ten knots an hour. She sailed for St. Paul's at daylight on Wednesday morning, and is expected to reach her destination in less than a fortnight.

"The peremptory nature of your telegram left no other course open to me than to charter at once, if any suitable vessel was obtainable, and the only choice I had was between the *Oberon* and a steamer of the Netherlands Indian Steam Navigation Company. I fixed the former, as it was eminently qualified to perform satisfactorily the service required. At the same time I regret that the Board did not leave me any discretionary powers, especially as it was known that Lieutenant Jones was on the way up from Sourabaya, and could inform me precisely as to urgency in the matter. Had this been done I most certainly should not have considered myself justified in incurring the above great expenditure, as Lieutenant Jones was of opinion that the few days elapsing between the arrivals of the *Oberon* and *Rinaldo* at St. Paul's would not in any way have affected the condition of the officers and men of the *Megæra*.

"I supplied by the *Oberon* all the provisions that Lieutenant Jones thought necessary, consisting of biscuit, flour, sugar, yams, onions, and pumpkins; while the captain of the *Oberon* agreed to supply to the island, tea, beef, and pork, should the paymaster of the *Megæra* require them.

"Lieutenant Jones writes you all particulars regarding the loss of the *Megæra* and the condition of the men on the island. Captain Thrupp's letter reporting the disaster was unfortunately not in the bag when Lieutenant Jones hurriedly left the island; but it will go forward in the *Oberon*, which is bound to London direct.

"The *Rinaldo* arrived on Tuesday, the 8th instant, and in terms of your telegram of the 9th instant, proceeded on the 10th, at midday to St. Paul's, with further provisions, and to convey to Singapore Captain Thrupp and witnesses for the court-martial. I regret

that your telegram reached me too late to inform Lieutenant Jones of this: and a telegram I dispatched to Anjer also most unfortunately arrived there an hour after the *Oberon* had passed.

"I telegraphed you on the 10th instant:—'*Oberon* had already left before your telegram was received. *Rinaldo* starts for St. Paul's this forenoon, which I hope reached you intelligibly.

"(Here follows enumeration of accounts and vouchers forwarded)—I am, etc.,

"W. T. Fraser,
"Her Britannic Majesty's Acting Consul."

"From Acting-Lieutenant Lewis T. Jones, of Her Majesty's ship *Megæra*, to the Secretary to the Admiralty.

"Batavia, August 7th.

"Sir,—I have the honour to report to you that Her Majesty's ship *Megæra* was run on shore on St. Paul's Island on Monday, June 19th, in a sinking state, and that all hands are saved and landed, with provisions and stores.

"The circumstances under which the *Megæra* was run on shore are as follows:—On June 8th, on the voyage from the Cape to Sydney, a leak was reported, but was for several days kept under by hand-pumps and baling. On or about the 14th of June the leak became more serious, and the water gained on the pumps. Steam was then used, and by the aid of the main steam pumps the water was kept in check.

"It was determined to steer for St. Paul's Island in order to examine the ship, where she arrived and anchored on Saturday, June 17th. A survey was then held, and a diver sent down to examine the leak. A hole was discovered worn through the centre of a plate, about 12ft. abaft the mainmast, and about 8ft. from the keel port side, besides other serious injuries in the immediate vicinity of the leak.

"On Sunday morning, June 18th, the report of survey was sent in. It was considered unsafe to leave the anchorage. Provisions and stores were then landed. On Monday forenoon, June 19th, weather being very stormy, and being unable to keep the ship in position, having carried away and lost three anchors since first anchoring, and being unable to carry on the work of landing provisions on account of the stormy weather, it was determined to beach the ship. At about one p.m. the ship was run full speed on to the bar, and remained there. She soon afterwards filled up to the main-deck aft at high water. The work of landing provisions and saving cargo was then continued, and a portion of the men

and officers landed in charge of the same. The ship was not entirely abandoned for about ten or twelve days after she was beached. I was ordered by Captain Thrupp to hold myself in readiness to intercept any passing vessel, and communicate intelligence to the senior naval officer at any port at which I should arrive. I left the island on Sunday, the 16th July, in the Dutch vessel *Aurora*, Capt. Fisser, owners Geedkoop and Co., Amsterdam, and arrived at Sourabaya on the 2nd of August, when I communicated with the senior naval officer in China and consul at Batavia.

"Up to the time I left the island about eighty tons of cargo for Sydney had been saved, and divers were still employed recovering it. Men and officers were living under canvas, and all are well. They had provisions to last, on half-allowance, till the beginning of November, with the exception of bread, flour, tea, and sugar, of which they were very short, men being on four ounces of bread per day.

"Water was obtained from summit of the hill, during rainy season, but could not be depended upon. It is considered impossible to render the ship fit for further service.

"I arrived at Batavia this day, August 7th, and proceed to St. Paul's by English merchant steamer *Oberon*, Captain Burgoyne, chartered by acting-consul, with necessary provisions for men.

"Captain Thrupp's letter, reporting the loss of the ship, was accidentally left out of the bag containing other dispatches, but will be forwarded to England by the ship *Oberon*.

"I have the honour, etc., LEWIS T. JONES,
"Acting-Lieutenant, H.M.S. *Megæra*."

METEOROLOGY OF CAPE HORN AND THE WEST COAST OF AFRICA.*

THESE contributions are expressed in the form of a series of twelve Meteorological Charts, corresponding to the twelve months of the year, with some useful letter-press summarising the informa-

* *Contributions to our Knowledge of the Meteorology of Cape Horn and the West Coast of Africa.* Published by the Authority of the Meteorological Committee. Stanford, Charing Cross. 1871.

tion contained in each Chart. The data given consist of barometrical readings, temperature of the air and sea, wind and rain or hail, etc., and they are founded on very careful observations, the collection of which was commenced under the direction of the late Admiral Fitzroy. On each chart a key diagram and explanation are inserted, so that the method adopted for expressing the data (the credit of which is mainly due to Captain Toynbee, the Marine Superintendent of the Meteorological Office) is made clear and intelligible. There is little to be said in the way of criticism upon such a publication as this, the data furnished are certainly reliable, and must prove (as Mr. Scott expresses his hopes they will do) acceptable to navigators.

We take the liberty of extracting the general remarks on the charts, which, as will be seen, treat of several matters of the utmost importance and interest to mariners. But at the same time, for the full scope of the work we must refer our readers to the book itself; and we can assure them they will find the charts really valuable contributions to our knowledge of meteorology.

"In considering these charts the reader will be struck by the small number of observations in some of the squares, but it was thought that as they were sifted into months, navigators would prefer their remaining so to their being thrown together and brought out in charts for three months, by which the number of observations in each square would be increased, but their distinctive value lessened. For instance, in the four squares south of Cape Horn, between 55° to 60° S. and 60° to 80° W., the proportion of winds with easting in them for the three months January, February, and March, taken together, is 15 per cent., but in February there are only 8, whilst in March there are 17 per cent.

"Again, it will be seen that in these months most of the observations lying between 20° to 30° S. and 85° to 100° W. were taken in January, and none in March. Then again, March shows an isotherm of 80°, whilst January only shows that of 70°. Similar important differences may be traced throughout the charts. It is always easy for the navigator to combine the data of any two or three charts, but impossible for him to sift them if they are once combined.

"Instead of the materials having been sifted too nicely, captains who beat to the westward round Cape Horn still ask a very practical question which our charts do not answer, viz., Is the easterly wind which exists in the five degree squares south of Cape Horn evenly spread over those squares, or is it more common to the southward than close up to the land?

"To answer this question it would be necessary to work up the data of these few squares into one degree squares. It is, however, instructive to notice that the amount of easterly winds shown in high latitudes is greater in June than in January. In the above-named four squares between 55° to 60° S. and 60° to 80° W. there are 22 per cent. of winds with easting in them in June, whilst between 80° and 90° W., in the same month, they amount to 67 per cent., no west wind being recorded in thirty-three observations. Now, according to Buys Ballot's law this indicates a higher pressure towards the pole in winter, similar to what is found to exist to the north of Iceland in the Atlantic. But whether this higher pressure over South Shetland than over the sea to the north of it prevails all the year round is still a disputed question; if it does, a corresponding prevalence of easterly wind may be expected to exist near that land, while westerly winds are blowing near Cape Horn.

"It is the opinion of some experienced men that this is the case, but the navigator must consider the risk of more ice and longer nights at certain seasons when tempted to go south in search of easterly winds.

"The Admiralty pilot charts allude to the idea that better passages to the westward are made by going to lat. 60° S. in July, August, and September.

"Although many parts of these charts suffer materially from want of data, there is such a general agreement amongst them that a cursory inspection of the isobars, isotherms, and wind arrows gives a good idea of the relation between pressure, temperature, and wind. The divergence of the isobars in about 40° to 45° S., part running to the north, whilst others run east or even S.E. (see the chart for March), with a corresponding divergence of the wind, is very instructive.

"The way in which an area of high pressure exists over the sea somewhere between 22° and 42° S., but does not reach to the land, is remarkable. In connection with this area of high pressure it is an interesting fact that the temperature is considerably higher over the district where it is observed than it is near the coast. The highest barometer recorded between 50° and 60° S. was 30·603 in June, the lowest 27·662 in April, and these are probably the extremes of pressure for that latitude.

"When considering the winds of corresponding latitudes in the North Atlantic, the navigator will see how this turning of the air, part towards the Equator, and part towards the Pole, corresponds with what is experienced to the westward of Portugal. *There*, in

about 40° N., and on the western side of a great ocean, the wind seems to split into northerly along the coast (where many seamen say it is northerly for ten months in the year), and S.W., or southerly, further north. This splitting of the air is also accompanied by an area of high pressure to the westward over the sea, and a lower pressure to the northward. (See Plate III. of the Barometer Manual, published by this Office.)

"It will be noticed that the wind seems to draw round the coast of Patagonia; for instance, the wind arrows indicate a more northerly direction on its west coast, more westerly on its south, and more southerly on its east coast. The swell of this latter wind seems to overrun it to a great distance; for instance, outward bound ships to India frequently experience a high S.W. swell at the southern verge of the S.E. trades in the Atlantic, though they rarely get the wind from that quarter. In a similar way at the northern verge of the N.E. trades, ships often get a high N.W. swell without its wind; this swell probably coming from the strong N.W. winds which prevail in high latitudes on the western side of the Atlantic at certain seasons.

"Between 50° and 60° S., both the air and sea are generally cooler to the eastward than to the westward of 75° W., the above-named tendency in the direction of the wind, and the well-known current to the N.E., as shown on the Admiralty pilot charts, have no doubt their influence in causing this result.

"It need hardly be remarked that a larger number of careful observations is needed, especially in the central parts of the South Pacific. The Admiralty wind charts for this ocean now coming out, indicate that a good deal of northerly wind frequently exists where the S.E. trades might be expected, and from our general knowledge of the working of Buys Ballot's law, it is clear that if a space be found to the westward of the areas of high pressure given in these charts, where the pressure is lower, a northerly wind may be expected to blow there. This shows the great value of careful barometer readings in fine weather, as a sufficient number will indicate the direction of the prevailing wind.

"The following table will enable the reader to compare the temperatures found within the area of high barometrical pressure and those observed on the coast.

Month.	Temperature in Lat. 40° S.		Temperature in Lat. 20° S.	
	Long. 100° W.	On the Coast.	Long. 100° W.	On the Coast.
January ...	65°	58°	73°	69°
February ...	62	60	—	70
March	62	58·	75	70
April	60	57	72	66
May	50*	55	69	65
June	55	50	—	65
July	52	49	71	62
August ...	47†	50	65	61
September ...	55	50	65	62
October ...	54	51	65	61
November ...	55	53	—	64
December ...	62	57	70	66
Mean ...	56·6	54·0	69·4	65·1

"The question arises, what produces this difference between the littoral and oceanic climate? The cause has hitherto been assigned to the cold water of the oceanic current discovered by Humboldt, which is said to exist off the coast of Chili and Peru, and to transport the waters of latitude 50° into the equatorial westerly drift. The observations of the temperature of the surface-water contained in these charts do not appear to give much support to this hypothesis, since the sea here is almost always warmer than the air. It would seem, therefore, that the air must cool the sea, rather than that the sea cools the air. The current may be an auxiliary cause, though we have not the means before us to investigate the matter; but the principal cause seems to be the prevalent southerly wind. From lat. 40° S., sometimes from 45° S., or much further, a southerly wind generally blows along the coast, and eventually turns into the S.E. trade, after passing the area of highest pressure. This wind only fails in July and August, which are precisely the months in which the isotherms of the middle latitudes are the least deflected northward. It seems therefore

* Very few observations give this result, in 95° W. the temperature is 60°.

† Very few observations in August, in 90° W. 25 observations give 54°.

probable that the general deflection of the isotherms northward, or in other words, the cool temperature off the coast, is brought about by this southerly wind which transfers the air of the temperate zone to the tropics.

"The extension from the coast of this southerly wind is given approximately below:

January..	to 85°	W.	in 40°	S.,	to 85°	W.	in 30° S.
February.	to 80°	,,	,,		to 85°	,,	,,
March ..	to 85°	,,	,,		to 80°	,,	25° S.
April ..	to 85°	,,	45°	S.,	to 82°	,,	,,
May ..	to 85°	,,	,,		to 80°	,,	20° S.
June ..	to 80°	,,	40°	S.,	to 80°	,,	25° S.
July ..	interrupted.						
August ..	interrupted.						
September	to 82°	W.	in 40°	S.,	to 82°	,,	30° S.
October ..	to 80°	,,	,,		to 85°	,,	25° S.
November	to 80°	,,	45°	S.,	to 80°	,,	30° S.
December	to 80°	,,	40°	S.,	to 85°	,,	25° S.

"The southerly wind begins to fail in June, during which month, as well as in July and August, the atmospheric pressure off the coast is nearly similar to that over the ocean to the westward.

"From March to August the trade wind extends only to 25° S., during the rest of the year it reaches 30° S.

"The arrows drawn upon the charts represent the prevalent winds. Generally they represent the current of air as flowing between the isobars conformably to the law of wind in relation to pressure in the southern hemisphere. Where the isobars are closest the winds are strongest, and where they diverge from each other light breezes are usually reported. Patches of high pressure seem to be frequently accompanied by light airs and calms. An irregular course of the isobars is generally indicative of atmospheric disturbance, or of variable winds.

"Between 50° and 60° S., and 50° to 70° W., kelp or other seaweed is frequently reported."

BERGHAUS' CHART OF THE WORLD.*

We have received a copy of a New Edition (the sixth) of Hermann Berghaus' admirable Chart of the World. We had previously heard something of sundry improvements and additions which had been introduced into this new edition, but we confess we were hardly prepared to find them so numerous and valuable. As a work of reference the chart will be most serviceable, and the name of Berghaus is a sufficient guarantee that the published information is perfectly reliable, we may also add the variety of the information given is rather astonishing.

In the new edition the map has been entirely re-arranged, and America is placed in the middle of the chart. By this means the great oceans are given whole and undivided, thus adding enormously to the convenience of reference and general utility. All lines of regular steamboat communication have been inserted, the colours and characters of the lines indicating their nationality and the periodical journeys performed. The principal tracts of sailing ships are also shewn—ocean currents, the depth of the sea, the extent of coral reefs, of pack and drift ice, of kelp and seaweed; the positions of submarine cables and the lines of lake and river steam navigation, are all pointed out with most admirable clearness. Besides all this the small marginal maps which have been considerably increased in this new edition are full of very interesting and useful details. We are not at all surprised to hear that this most valuable compendium of information has been favourably received by the scientific world of the continent. We ourselves prize very highly the copy sent to us, and we commend it to all who desire to possess a comprehensive and reliable chart of the world. The price is certainly not expensive for such a work—a guinea will buy the chart and cover all expenses of transmission from Gotha.

A Floating Breakwater at Greypoint.—On Wednesday a floating breakwater, which had been conveyed from Plymouth by Her Majesty's ship *Valorous*, was anchored on the county Down side of Belfast Lough, between Greypoint and the Horse Rock, and but a short distance off the shore. The breakwater presents the appearance of a raft, but is of the most improved construction and of great strength.

* Chart of the World. Hermann Berghaus. Sixth Edition. Gotha: Justius Perthes. 1871.

MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
66	China—Yang-tse-Kiang.—Shaweishan Island.	Establishment of a Light.
	" " —Tungsha Bank.	Establishment of a new Light vessel.
	" " —Wusung Light.	A more powerful Light exhibited.
	" " —Wusung Bar.	Buoyage.
67	Ireland—Shannon River, Upper part.	Establishment of Lights.
68	United States—San Francisco.	Establishment of Buoys.
69	Cape Breton Island—East Coast—Scatari Island.	Establishment of Lights.
	" —Ingonish Island.	" "
	" —St. Anne's Harbour.	" "
70	United States—Maine—Casco Bay—Halfway Rock.	Establishment of a Light.
	" —Massachusetts—Thatcher's Island.	Fog Whistle replacing Fog Trumpet.
	" —New York—Long Island—Eaton's Neck.	Fog Signal.
71	South Australia—St. Vincent Gulf—Cape Jervis.	Exhibition of a Light.
72	Gulf of St. Lawrence—Anticosti Island—South Point.	Establishment of a Light and Fog Signal.
	" " —New Brunswick—Cape Magdalen	Establishment of a Light.
	" " —New Brunswick—Cape Chatte.	Establishment of a Light.
	" " —St. Paul's Island.	Alteration in Fog Signal.
	United States—Massachusetts—Plymouth.	Establishment of a Light.
73	Bermuda—Narrow to Stay Channel.	Alteration in Buoyage.

NAUTICAL NOTICES.

(All Bearings are Magnetic.)

66. *China—Yang-tse-Kiang—Shaweishan Island.*—A *fixed* light of the first order elevated 229 feet above high water and which should be seen 22 miles, has been established on this island in lat. 31° 24′ N., long. 122° 14′ E. The lighthouse is painted black and the keeper's dwellings white.

China—Yang-tse-Kiang—Tungsha Bank.—A new light-vessel has been moored on the south-west part of this bank. The light is a *revolving* light with flashes *every half-minute*. The lighthouse is painted *red*, with the name *Tungsha* on her side, and lies in 3½ fathoms with Gutzlaff lighthouse bearing S. by E. ½ E.; Shaweishan Island, N.E. ½ E.; and Kintoan lighthouse, N.W. by W. ½ W.

In thick or foggy weather a steam horn will be sounded at intervals of *half-a-minute.*

Note.—When vessels are running into danger, a gun will be fired from the light-vessel and the course to be steered indicated by signal in Marryatt's Code. When it is necessary to lower the light for trimming, a small light will be hoisted, and a blue light burned.

China—Yang-tse-Kiang—Wusung Light and Bar.—The light to lead through the channel from the Yang-tse-kiang to the Wusung or Wangpu river will be more powerful. The light bears from the centre of the navigable channel S.W. by W. $\frac{1}{8}$ W.

In consequence of the changes on the Wusung bar, two *red* buoys have been placed to mark the channel. These buoys are moored in 13 feet, on the northern edge of the shoal extending to the west-north-west of Gough Island, and are to be left at a distance of one-third of a cable on the starboard hand by vessels bound in, and must not be brought to bear to the northward of the line between them.

Also, that two signals have been added to the Code, a ball under the 24 feet signal will show 25 feet water on the bar, and two balls under the 13 feet signal will mark 26 feet.

67. *Ireland—Shannon River.*—The following fixed lights have been established in the upper part of the estuary of the river.

Horse Rock, on North side of Channel, above 12$\frac{3}{4}$ miles below Limerick.

Sod Island, on North side of Channel, about 10$\frac{1}{2}$ miles below Limerick.

Logheen, on North side of Channel, about 9 miles below Limerick.

Spilling Rock, on South side of Channel, about 8 miles below Limerick.

Crawford Rock, on North side of Channel, about 6$\frac{1}{4}$ miles below Limerick.

Ballast Rock, on North side of Channel, about 4 miles below Limerick.

Coonagh Point, on North side of Channel, about 3 miles below Limerick.

Braemar Point, on South side of Channel, about 2$\frac{1}{2}$ miles below Limerick.

Clonmacken Point, on North side of Channel, about 1$\frac{1}{2}$ miles below Limerick.

Barrington Quay, on North side of Channel, about three-quarters of a mile below Limerick, *red* to westward, *green* to eastward.

Dock Head, on South side of Channel, at Limerick, *red* to westward.

68. *United States—San Francisco.*—The following buoys have been placed as a guide for vessels crossing the bar and entering the harbour.

Outer Buoy,—black and white,—is outside the bar in 13$\frac{1}{2}$ fathoms, with the Middle buoy bearing N.E. $\frac{1}{8}$ E. 5$\frac{1}{4}$ miles, and Fort point 10 miles distant.

Middle Buoy,—black and white,—is in 9$\frac{1}{2}$ fathoms, with the Inner buoy bearing N.E. $\frac{1}{8}$ E. 2$\frac{1}{8}$ miles, and Fort point 4$\frac{3}{4}$ miles distant.

Inner Buoy,—black and white,—is in 20 fathoms, between Bonita and Lobos points, with Fort point bearing N.E. $\frac{1}{8}$ E. 2$\frac{1}{8}$ miles.

Four Fathom Bank.—Also, that the Four Fathoms bank is marked by two *black* buoys.

The buoy off the west end lies W. by S. $\frac{1}{2}$ S. $3\frac{1}{4}$ miles from the buoy off the east end of the bank.

The east buoy is in $5\frac{1}{2}$ fathoms, W. by S. $\frac{1}{2}$ S. $1\frac{1}{8}$ miles from Bonita point.

It is said the west buoy cannot be depended on as remaining in position.

These buoys are placed in line with Fort point bearing N.E. $\frac{7}{8}$ E.

69. *Cape Breton Island—East Coast—Scatari Island.*—A *fixed red* light, elevated 90 feet above high water, and visible 9 miles, has been established on this island in lat. 46° 0½′ N., long. 59° 47½′ W.

Cape Breton Island—Ingonish Island.—A *fixed white* light of the fifth order is now established on this island. It is elevated 237 feet above high water, and in clear weather should be seen from a distance of 15 miles. Position, lat. 46° 41½′ N., long. 60° 20′ W.

Cape Breton Island—St. Anne's Harbour.—A *fixed white* light 24 feet above high water, and visible 8 miles, is established on Beach point, at the entrance of this harbour, in lat. 46° 17½′ N., long. 60° 32¼′ W.

70. *United States—Maine—Casco Bay—Half-way rock.*—A *fixed white* light with a *flash every minute*, of the third order, elevated 75 feet, and visible 15 miles, has been established on this rock in lat. 43° 39½′ N., long. 70° 2′ W.

United States—Cape Ann.—The fog trumpet on Thatcher's Island has been replaced by a steam fog whistle, which in thick or foggy weather gives each minute a blast of *eight seconds* and a blast of *four seconds*, with an interval of *four seconds* between the blasts.

United States—Long Island—Eaton's Neck.—A syren, worked by steam, has been placed at the lighthouse, which in foggy weather will sound *nine seconds* at intervals of *fifteen seconds*.

71. *South Australia—St. Vincent Gulf—Cape Jervis.*—In accordance with No. 24 (April number), a *fixed white* light is now exhibited on Cape Jervis, it is visible seaward between the bearings N.N.E. ½ E. and S. ¼ E., and should be seen 13 miles. Position, lat. 35° 37′ S., long. 138° 7½′ E.

72. *Gulf of St. Lawrence—Anticosti Island—South Point.*—A catoptric *flashing white* light shewing a flash *every twenty seconds*, elevated 75 feet above the sea, and visible 14 miles in clear weather, has been established three quarters of a mile from the point, in lat. 49° 4′ N., long. 62° 15′ W. Also a steam fog whistle near the lighthouse, which, in thick or foggy weather will be sounded for *ten seconds* in *every minute*.

Gulf of St. Lawrence—New Brunswick—Cape Magdalen.—A *revolving* light showing *red* and *white* at intervals of *two minutes*, elevated 147 feet above the sea, has been established on this cape. In clear weather the

red light should be seen 15 miles, and the white light 20 miles. Position, lat. 49° 15′ 40″ N., long. 65° 19′ 30″ W.

Gulf of St. Lawrence—New Brunswick—Cape Chatte.—A *flashing white* light, showing a flash every half-minute, elevated 110 feet above the sea, has been established. In clear weather it should be seen 18 miles. Position, lat. 49° 5′ 50″, long. 66° 45′ 50″ W.

Gulf of St. Lawrence—St. Paul's Island.—From the 1st December, the fog signal at the S.W. lighthouse will be discontinued, and in the early part of next season, a steam fog whistle will be substituted for it: until the whistle is ready a gun will be fired at the main station on the east side of the island in thick and foggy weather, during the season of navigation every hour instead of every four hours as heretofore.

United States—Cape Coa Bay—Plymouth Harbour.—A *fixed white* light has been established near Duxbury Pier; elevated 34 feet above high water, and visible 11 miles.

The tower is built of iron and painted red, it stands in one foot water at low water springs.

73. *Bermuda Island.*—The outer chequered buoy on the Port side, going in, next the fairway buoy, has been altered to *black with staff;* the remainder of the buoys on this side of the Channel are black, as heretofore.

All the white buoys on the starboard side of the Channel have been altered to *chequered black and white.*

HYDROGRAPHIC.

Coast of Ireland.—Blackwater and Arklow Banks.

The following information on changes that have taken place in the Blackwater and Arklow banks has been received from Staff Commander John Richards, R.N., of H.M. Surveying vessel *Lightning*, 1871:—

[*All Bearings are Magnetic. Variation* 23° 30′ *Westerly in* 1871.]

Holden's Bed, in Wexford south bay, has shifted more than half a mile to the north-eastward of its position as given on the present charts, and has on its central part as little as six feet.

The Blackwater Bank has grown out on the eastern side between Nos. 2 and 3 buoys for a distance of two and a half cables, and on the north-western side about one cable. The general depth on the bank does not appear to have greatly altered.

The Arklow Bank has grown out on its south-east side about two and a half cables, and is also much shoaler to the northward. Arklow swatch has disappeared, there being now only a quarter of a fathom where four fathoms were formerly found.

Arklow Light Vessel is seven cables N.N.E. from the position given on the present charts. She lies South distant one and two-thirds miles from the depth of three fathoms on the south-eastern edge of the bank. Wicklow head bearing N. by E. $\frac{3}{4}$ E., sixteen and a half miles distant, Tara hill N.W. by W. $\frac{1}{2}$ W., and the Blackwater light vessel S.W. $\frac{1}{4}$ W. twelve miles.

The actual positions of the buoys marking the banks examined by the *Lightning*, have been found to differ but slightly from those shown in the Admiralty Chart, excepting the South Arklow (No. 4,) and Holden's Bed buoy in Wexford south bay. The true position of South Arklow buoy is S.W. by W., about half a mile distant from that shown in the chart, and Holden's Bed buoy lies South one and a half cables off where the chart has it.

Sulu Sea.

The following information, relative to shoals in the Sulu Sea, has been received from Commander William Chimmo, R.N., of H.M. Surveying-vessel *Nassau*, 1871.

Banguey South Channel.—A dangerous patch, having only eleven feet water on it, has been found about ten miles N.E. by E. $\frac{1}{2}$ E. from Stragglers island.

The Pudsey Dawson Dangers are a mass of coral patches running about twelve miles in an E.N.E. direction, having as little as fifteen feet water on them. The western patch lies E. $\frac{1}{2}$ S., distant twenty miles from the eastern point of Mallawallé island.

The Muleegee Patches, having five, six, and seven fathoms, and probably less, water over them, lie W. $\frac{1}{2}$ N., twenty to twenty-five miles from Muleegee islands.

In addition to the above-named dangers many patches of from three to seven fathoms have been found; mariners are therefore cautioned to be vigilant when navigating this part of the Sulu Sea. There is a clear and safe passage from the Main channel, Balabac strait, to Cagayan Sulu.

A reef with four fathoms has been found lying N.E. by E., about three miles from Keenapoussan islaud, to the northward of Cagayan Sulu.

The space north of Cagayan Sulu, marked "many shoals here," has been examined, and deep water found in its neighbourhood.

Sulu Archipelago.—A dangerous reef of rocks awash at high

water has been found in the fairway between the Sulu and Tawi-Tawi groups. It lies S.W. by W., two and a half miles from Parangaan island, and appears to be connected with Cacataan island by a four and a half fathoms patch of coral.

An extensive sand bank, over which the sea breaks at low water, lies S.W. ½ S., three and a half miles from Parangaan.

The tides run with great velocity in this locality, the flood setting to the south-east, and the ebb to the west.

These localities are in course of examination by H.M.S. *Nassau;* the present notice is therefore only to be considered preliminary.

Tonga or Friendly Islands.

The following account of a newly discovered rock in the Friendly island group has been received from Captain J. E. Montgomerie, H.M.S. *Blanche.*

H.M.S. *Blanche,* when on her passage from Vavau to Tonga, and about midway between Letté and Kao islands, saw a rock, a few feet above water: owing to the hazy state of the atmosphere at the time no land could be seen to verify by bearings the exact position of the ship; but, as the run from the last land seen had been made in four and a half hours, and Kao island was seen one and a quarter hours after the discovery of the rock, the assigned position of latitude 19° 17′ S., longitude 174° 45′ W. must be near the truth.

With reference to the above danger, it is stated on the authority of Captain Sir Everard Home, H.M.S. *Calliope,* who visited the Friendly group in 1852, that a volcano, or the indications of one, had been perceived about half way between the islands of Kao and Letté; and about twelve months previous smoke had been seen issuing from the surface of the sea: this was an object of search, and it was made, but without success.

From the foregoing account it is probable that the rock observed in H.M.S. *Blanche* is the same as those shoals marked on the Admiralty Chart, No. 2421, in doubtful positions, as the Home shoal, St. Michael shoal, and a reef, N. ½ W., twenty-two miles from Kao island.

Geographe Bay.

The following information relative to the capabilities of Geographe Bay in Western Australia as a secure and convenient anchorage has been received from His excellency the Governor of that Colony, 1871.

It is accordingly published for the guidance of seamen as forming an useful addition to the information already given in Vol. III. of the Australia Directory, extracts from which are appended.

Residents of long standing and captains of merchant vessels who have of late years visited Geographe Bay agree in considering that it has good and safe anchorages, with smooth water and well sheltered from all winds westward of N.N.W.; that as an anchorage it is one of the best in Western Australia or Victoria, being preferred by them to Freemantle, Macdonnell Bay, Portland, Port Fairy, or Warrnambool, and that if a vessel be provided with good ground tackle it may be used with safety both in winter and summer. The depth of water is sufficient for vessels of moderate tonnage, there being four fathoms within a mile of the shore, and vessels are easily loaded with timber by the Australian Timber Company established on its shores.

Should masters of ships not like to remain at the anchorage off the timber station, the signs of approaching bad weather give ample time for them to run under Cape Naturaliste and find protection in all weathers.

It is farther stated that a reef of rocks crosses Geographe Bay from Cape Naturaliste to Koombanahpoint, and although the bay appears to lie open to the full force of the northerly and north-westerly gales, yet through the even nature of the bottom, which is covered with seaweed, and deepens very gradually from the beach to a depth of twenty fathoms in a distance of about twenty miles, these winds only create a broken swell not sufficient to wet the flooring of Busselton jetty.

The south-west swell divides between Cape Leeuwin and Cape Naturaliste, the northern current rushing past the latter cape and crossing Geographe Bay intercepts the swell caused by northerly gales. The bay is protected from Castle Rock to Minninup by Cape Naturaliste, and vessels finding it advisable to seek more shelter during a gale should make for Dimsbro Bay, which is also protected by the reefs extending from the cape. The northerly gales seldom last more than six or eight hours and then veer to north-west.

Busselton Jetty runs in a north and south direction and is fully exposed to the force of the northerly winds, its platform being only eight feet above the sea. Coasting vessels have remained at anchor off this jetty in perfect safety during the most severe gales.

The brigantine *Odalisk* lay in Geographe Bay through the winter of 1869, and only on one occasion had to let go a second anchor. Several stiff gales were experienced, but the sea never came in heavily.

In June, 1867, the *Odalisk* ran inside Cape Naturaliste in a strong gale from west and W.N.W., and anchored about six miles south-east of the cape in smooth water.

The *Eliza Blanche* put into Geographe Bay for shelter three times in 1870, when on her passage from Adelaide to Freemantle.

Geographe Bay is described at pages 221 and 222 of the above-mentioned work as a wide and deep bay, the soundings decreasing from about eighteen fathoms near the centre of the bay, to three fathoms at one mile from the southern shore.

The southern shore is low and sandy, and off it vessels employed in bay whaling and in embarking timber find good anchorage during the greater part of the year, notwithstanding their exposure to the north-west winds of the winter months.

Busselton.—The anchorage chiefly resorted to by shipping in Geographe Bay is in three to five fathoms water off the mouth of Vasse inlet and the small town of Busselton.

At half a mile to the northward of the town there is a narrow strip of weeds, with only nine feet water over them; but the water deepens to three fathoms close to the northward of this strip, and to two and a quarter fathoms towards another weedy bank which extends from the shore.

Approaches to Geographe Bay.—Cape Naturaliste, the western headland of Geographe Bay, is low at its extremity, but soon rises to an elevation of 500 or 600 feet, its rounded summits appearing smooth and much wooded. The extremity of the cape is closely fronted by rocks.

Pioneer Reef is said to lie four miles to the northward of Cape Naturaliste, heavy breakers having been seen in that position by the *Pioneer*, American whaler, in a light breeze after a heavy gale in 1838. H.M.S. *Beagle*, in 1842, passed close to the spot, and saw no appearance of the reef, although aware of its reported existence. From the soundings being very regular in twenty-five to twenty-seven fathoms, it is supposed that the broken water seen by the *Pioneer* was caused by the meeting of the swell from the south-west with a strong southerly current sweeping out of Geographe Bay.

Wright Bank, said to be a patch of rocks with five or six fathoms over them, is reported to have been sailed over at about one and a half miles to the northward of Cape Naturaliste, by the *Samuel Wright*, American whaler. The *Beagle*, on the foregoing occasion, passed at about a mile to the north-westward of its supposed position, with regular sounding in twenty-seven fathoms, without any appearance of shoal water.

Naturaliste Reef lies N. by E. sixteen or seventeen miles from the extremity of Cape Naturaliste, and consists of three patches of covered rocks extending about one and a quarter miles, N.E by E. and S.W. by W., with passages between them. The sea does not always break on this danger, nor do the soundings afford any certain warning in approaching it, the average depth of water being twenty-five to thirty fathoms at five or six miles to the westward of the reef; and there are thirteen fathoms at one mile to the northward of it.

Naturaliste Reef, and the supposed Pioneer Reef, and Wright Bank are the only dangers reported to exist in the vicinity of Cape Naturaliste.

East Coast of China.

The following information has been received from Lieutenant Rockwell, commanding the U.S.S. *Palos*, relating to a dangerous shoal off Turtle rock, near Cupchi point.

[*All Bearings are Magnetic.*]

The U.S.S. *Palos*, when on her passage from Hong Kong to Wusung discovered off Turtle rock a shoal, with a number of soft lumps on it having only two fathoms water on them. From the shoal Cupchi point bore N. $\frac{3}{4}$ E. three miles, and the Hill marked on the chart as 726 feet high, N.W. $\frac{3}{4}$ W. seven and a quarter miles. According to these bearings the shoal is in latitude 22° 46′ N., longitude 116° 3′ 30″ E.

As this danger lies in the track of navigation, vessels should be cautious to give it a wide berth, when passing the Turtle rock.

COAST AND HARBOUR LIGHTS.—JAVA.

The following appears in the *Java Courant* (the official journal):—The want of coast and harbour lights in the Archipelago has formerly given rise repeatedly to complaints from traders and seafaring men. The government, acknowledging the justice of these complaints, has met them. Ten years ago, two lights only were burning in the whole of this Archipelago—the one, a coast light of the second order on Java's fourth point, near Anjer, set up on a wooden tower which had formerly served for the light of the fourth

order, and was proportionally low for the larger light; the other was a light of the fourth order at Macassar. Now, there are no less than twenty-one lights of varying size in working order. The preparatory works for two others are now in hand, and the placing of two more of the largest sort is now under consideration. The efforts to have these works carried out by private enterprise have had a satisfactory result of late. These happy results cause it to be hoped that private enterprise will, on subsequent occasions, be aroused to compete still more. The lights now shown or in hand, their size, the date when set up, are set forth in the following statement:—

1. A coast light of the second order on Java's fourth point near Anjer, set up in 1854; the light was removed to a stone tower in 1865.

2. A harbour light of the fourth order at Macassar, 1st January, 1861.

3. A coast light of the second order on Tanjong Kalean, 16th May, 1862.

4. A harbour light of the fourth order at Batavia, 1st January, 1863.

5. One of the sixth order at Muntok, 6th October, 1866.

6. One of the same order at Banjoewangie, 4th December, 1865.

7. A ditto ditto at Pekalongan, 27th September, 1866.

8. A ditto ditto on Pulo Sao, Rhio Straits, 22nd January, 1867.

9. A ditto ditto on Pulu Terkulei, in Rhio Straits, 22nd January, 1867.

10. A ditto ditto on Little Pulu Karoan, in Rhio Straits, 22nd January, 1867.

11. A ditto ditto at Cheribon, 1st July, 1867.

12. A revolving coast light of the second order on Northwacher Island, 5th November, 1869.

13. A lightship in the Lucipara Passage (Banka Straits), 5th November, 1869.

14. A harbour light of the sixth order on Pulu Chilaka (Macclesfield Straits), 1st December, 1869.

15. A harbour light of the sixth order at Anjer, 20th December, 1869.

16. A revolving coast light of the third order on Nusa Kambangan (Tjilatjap), 15th April, 1870.

17. A harbour light of the sixth order on Tanjong Labu (W. corner of Pulu Lepar, in Macclesfield Straits), 1st October, 1870.

18. A harbour light of the sixth order in Kampong Marisa (Macassar), 1st October, 1870.

N.B.—The light is to replace the lightship near Great Lae Lae (Macassar Roadstead), placed there on the 1st November, 1866.

19. A lightship in the W. Channel of Sourabaya, 18th November, 1870.

20. A harbour light of the sixth order at Bencoolen, 20th May, 1871.

21. A ditto ditto on Pulo Tikus, near Bencoolen, 20th May, 1871.

In building:—

22. A harbour light of the sixth order at Grissee.

23. A revolving light of the fourth order on Zwaantjes Shoal (Madura Straits).

24. A stationary light of the sixth order on Doves Island (Bali Straits).

GENERAL.

Royal National Lifeboat Institution.—A meeting of this institution was held at its house, John-street, Adelphi, on Thursday, 7th September, Sir Edward Perrott, Bart., V.P., in the chair. Rewards amounting to £73 were granted to the crews of different lifeboats for recent services on the occasion of shipwrecks on our coasts. The Arklow lifeboat went off through a very heavy sea to the stranded brigantine *Jane*, of Barmouth, and was successful in saving her crew of five men. A few hours afterwards the same valuable lifeboat proceeded out again to another brigantine, the *Roscius*, of Belfast, which had also gone on the Arklow sandbank. On reaching the vessel she was found to be abandoned, her crew having landed at Wicklow. Some of the lifeboat men then went on board, and, after prolonged exertions, the brigantine having been lightened of some of her cargo of pig iron, was taken safely into Kingstown Harbour. The Arbroath lifeboat, during a strong gale and a very heavy cross sea, was the means on the occasion of the wreck of the schooner *Ann*, of Inverness, of saving from an inevitable death the vessel's crew of five men and the pilot, who belonged to Arbroath. The Ramsey lifeboat went to the aid of the distressed schooner *Rapid*, of Preston, her sails being torn away and her anchor not holding, and brought her into harbour. The Southport lifeboat was taken during a strong westerly gale to the stranded barque *Times*, of Liverpool, and saved all on board, seventeen in number.

The lifeboat was said to have behaved admirably in the heavy seas she had to encounter. The Whitehaven lifeboat went off to the schooner *Intrepid*, of Liverpool, in reply to signals of distress, and remained by her until a steam tug arrived, when she was taken into port. The Dundalk lifeboat also went to the aid of the dismasted brigantine *Zoe*, of that port, which was in a dangerous position, and had all her boats destroyed. At the urgent request of the vessel's crew, the lifeboat stayed by her all night, and until she was taken to a safe position the next day. The Fraserburgh lifeboat also succeeded a short time since in bringing to land the crews, numbering eleven men, of two fishing boats, which were in great danger of being wrecked near the lifeboat station during a N.N.W. gale. Other rewards were also granted to the crews of different shore boats for saving life from wrecks on our coasts.

New lifeboats had been sent by the institution during the past month to Bridlington, Yorkshire, and to Thurso, N.B., and it was also decided to form a lifeboat establishment at Greystones, county Wicklow. Reports were read from Captain J. R. Ward, R.N., the Inspector, and Captain D. Robertson, R.N., the Assistant-Inspector of Lifeboats to the Institution, on their recent visits to the coast. It was stated that the safety fishing boat improvements introduced by the institution had been adopted in the majority of the fishing boats on the Scotch coast, and that few boats are now built without being partly decked.

Hurricane in the West Indies.—On the 21st of August a severe cyclone visited Antigua, St. Kitts, St. Bartholomew, St. Martin, Tortola, St. Thomas, and one side of Porto Rico. St. Thomas experienced the gale most severely. The *St. Thomas Tidende* says that, "On Saturday evening, August 19th, there was an oppressive stillness in the atmosphere, and the heat was distressing. On Sunday morning there was a change, and at half-past ten the barometer stood at 30·15. The wind was blowing in gusts from N.N.E. to E.N.E. The barometer continued to fall slowly, and at 8.30 p.m. it marked 30·10. During the night the wind continued to blow in gusts, and to increase in violence. The barometer continued to fall all night, and at four a.m. on Monday, the 21st, it stood at 30, and remained so until nine a.m., the wind continuing to blow in gusts and rain squalls at points varying from E. to N.E., raising foam from the whitened surface of the sea and whirling it off in clouds of spray. At 12.30 the barometer was 29·70, and still falling gradually, the wind blowing in fearful gusts and veering round more northerly. At 3.30 the barometer was at 29·50, the

wind continuing to veer round to north-west, and still blowing with great violence. The heaviest gusts were between 4.30 and 5.0 p.m., when they came with terrific violence from north-west. Then it was that the great work of destruction was completed. At five o'clock there was a sudden calm, the centre of the cyclone passing over St. Thomas during this calm. The barometer reached its lowest point at one a.m. In the harbour it showed 28·40. After half an hour it began to blow again in heavy squalls from the south-west to south, the barometer rising rapidly. At seven o'clock it was as high as 29·50, and the violence of the wind had ceased. On Tuesday morning was revealed the full extent of the fearful havoc. Of some houses there was scarcely a vestige left; others were but heaps of smashed lumber. Some had been moved from one place to another; others had been turned upside down. Inland in the island houses, fruit trees, fences, and crops were blown down. The losses experienced by the planters and labourers were very severe, and will be felt by them for a long time. There was not much shipping in the harbour, and what there was, having more room to swing, was not much injured. St. Thomas is considered to have suffered more on shore than in 1867. The losses are returned at forty-two persons killed, seventy-nine seriously injured, and 420 houses completely destroyed. The town appears as if it had suffered a bombardment. No lives were lost by damage to the shipping. The barque *Duke of Wellington* with a cargo of 670 hhds. of sugar was lost. The American steamer *Florida* had to cut away her masts, and the steamer *Sonora* parted from her moorings and ran ashore. The steamer *Governor Berg* was run ashore, and the schooners *Dos Amigos*, *Grasmere*, and *Lizzie* were injured. At Antigua the effects of the cyclone were equally severe, and the loss of life was greater. Eighty persons are reported killed, and the number of badly wounded is rated at several hundreds. Scarcely a house or plantation in the island has escaped serious damage. The public buildings have all been more or less damaged. The bishop's residence has been destroyed, and his library spoilt. Among the shipping, the *Westwood*, *Uncle Ned*, and the *Italian Hero* were driven ashore. At St. Kitts only two lives were lost, but the damage to property was as bad as at Antigua. The *Warrior*, just finished loading molasses, was a total wreck; crew saved. The schooner *Virginia* foundered; captain and a boy drowned. The barque *Ariel*, the brig *Elite*, and the *Laura Pride* were dismasted. Saba and Tortola suffered from the cyclone but slightly, compared with Antigua and St. Thomas. The other islands visited by the gale escaped without material damage. The American brigantine *Julia F. Carney*, laden with a

general cargo from Philadelphia, was blown out of Philipsburg at St. Martin's, and foundered about forty miles westward of the island. The crew were picked up by the English brig *Juniata*. At Port Rico no damage had been done to the city, but the land wires having been destroyed there was no communication with other parts. It was reported that nine vessels were lost at Arecibo."

It is satisfactory to learn that the distress occasioned by this terrible hurricane has become a subject for charitable consideration in London; we trust that the meeting to be held at the Mansion House will be the means of some relief being afforded to the sufferers.

SEAMEN'S ORPHAN INSTITUTION AT LIVERPOOL.—The foundation-stone of a new Seamen's Orphan Institution has been laid at Newsham Park, Liverpool. After the laying of the stone, and addresses by Mr. Brocklebank and the Bishop of Chester, the Earl of Derby made a speech, in which he spoke of the different classes by whose exertions Liverpool had been made the first seaport in the world, especially the seamen of the mercantile marine. His lordship said:—"Of all labour there is none to which we are more indebted, or in regard to which we ought to be more willing to pay back some part of that debt, than to the sailor of our merchant service. At the best a sailor's is a way of life which involves absence from home and family during at least two-thirds of a man's time. It involves poor and crowded lodgings, peculiar tendencies to irregular and reckless living when off duty; while when on duty the sailor is exposed to dangers which no human skill, or care, or science can always avert. In fact, no care, skill, or sympathy can make that life other than a hard and precarious one."

We are glad to notice that Liverpool is not behindhand in such works of charity as this, and our gratification is greatly enhanced by the fact of Lord Derby speaking such kind words on behalf of the sailor.

H.M.S. RINALDO AND THE SALANGORE PIRATES.—The following is the official report of the action in which H.M.S. *Rinaldo* was engaged on the 4th July last against the town of Salangore, which was found to be a regular nest of pirates:—

"To His Excellency Colonel Anson, Administrator, Straits Settlement.

"Her Majesty's ship *Rinaldo*, off Salangore, July 6th, 1871.

"Sir,—In consequence of a requisition from you on the 30th Aug., I have the honour to state that within twenty-four hours after

receiving your letter I started from Singapore to meet the Colonial steamer *Pluto* at the rendezvous arranged by telegraph; then proceeded to Salangore for the purpose of seizing the six pirates still at large concerned in the murder of the thirty-four men, women, and children on board the junk, and to take such measures as might seem best for the punishment of those Malays who resisted the Colonial officers and men in their attempt to secure the pirates. On the evening of the 2nd, we fell in with the *Pluto* at the rendezvous off the North Sand lightship in the Strait of Malacca, and proceeded in company with her towards Salangore. At 4.45 on the morning of the 3rd, we anchored near the bar of Salangore River, manned and armed boats, and sent them with field-piece party to the *Pluto*. Our party consisted of ninety-five men and officers under my personal command (Lieutenant Grosvenor Stopford, Senior Lieutenant; Acting-Lieutenant Eustace D. Maude, Sub-Lieutenant Christopher G. Williams, and Acting Sub-Lieutenant James A. Ward). At 7.30, the *Pluto* started for the river with boats in tow; at eight stopped to overhaul two prows sailing out of river; nine, grounded on the bar. Commander Grey, your private secretary, who was on board as my guest, then left the steamer in her gig, with the second officer, for the purpose of obtaining information that might be useful to us;—1, floated and proceeded; 2, anchored off the town of Salangore, when Commander Grey returned on board. Sent boats away manned and armed to search both sides of the river and vessels at anchor. Lieutenant Stopford was in charge of the pinnace, with Mr. Skinner and Commander Grey, and that party proceeded to search the houses on the river. Lieutenant Maude was in charge of the cutter armed with a rocket, and went to search a few huts on the north side. Mr. Williams, Sub-Lieutenant, was in charge of the other cutter, and proceeded to search the vessels at anchor; he was accompanied by the owner of the captured junk, and the only survivor of the crew. Maude had with him the second officer of the *Pluto*, who speaks Malay, and one of the *Pluto's* men who knows the place. After the lapse of an hour and a half I saw Lieutenant Maude's party return, and immediately afterwards firing began between the natives, surrounding them in houses and jungle, and that party.

"Lieutenant Maude's story is as follows:—On landing he asked for Rajah Mahmood, and was told that he was away, and that no one knew where his house was. He then marched about 200 yards on the path leading from the beach. A native then told him the Rajah would come, so he landed and waited about ten minutes. Finding he did not arrive, he continued his march, and after going

about a mile, met the Rajah, who saluted and shook hands, and said he would go off to the *Pluto*. They all marched together to the beach, where Maude drew up his men. The Rajah went between the boat and the small-arm men, with about fifty men round him. He was told that the boat was ready, when he replied that he would not go now as he wanted to cross over on to the other side. Maude told him if he did not come willingly he must force him. Immediately afterwards a shot was fired at our men from the nearest house, at a distance of only ten yards. The Rajah and his men immediately fled into the jungle, and heavy firing immediately following from huts and jungle. One of our men fell mortally wounded at once—and Maude was obliged to make the best of his way back to the *Pluto*, followed by a continuous fire which did not cease till he got alongside. As the *Pluto* was only 200 yards off, a return fire was instantly opened by those of our men who remained on board, and from the field-piece which I had ready for use in the bow of the steamer. The other boats returned when they heard the firing. Several Malays fell to the force of Lieutenant Maude's men, and Rajah Madie was said to be one of them. I have to deplore the following loss:—Lieutenant Maude, cut on hand with kriss; William Horton, leading seaman, thought to be mortally wounded—shot through the lungs; William M'Gee, ord., shot wound in side; James Cole, leading seaman, shot in shoulder; Edward Barnes, ord., shot in neck; Charles Bradley, armourer, shot through both legs; Thomas Biddlecombe, smith, shot in hand. You may imagine how painful it was for me to order the *Pluto's* anchor to be weighed without inflicting more decided vengeance on the piratical rascals who had fired on Lieutenant Maude's men, but our men, crowded in boats, were at a fearful disadvantage from enemies concealed in the jungle, and we had no medical man to attend to the wounded. However, I called all hands aft and told them I would land and take the Forts at the entrance of the river directly the *Pluto* got close to them. The jungle there seemed less dense, and it seemed the only revenge open to us at the moment. But Captain Bradbery, of the *Pluto*, then made such a strong remonstrance to me that his vessel had only half-inch plates, and that his boiler was above water, that I reluctantly changed my mind and determined to take the *Rinaldo* in next day if possible. I am very glad now that I did change my mind. Under these circumstances I decided to return to the *Rinaldo*, anchored about six miles off, and to send the *Pluto* to Penang with the wounded and with a letter to the Lieutenant-Governor asking for a surgeon. I also advised that some troops should be sent to assist in jungle-

fighting, and desired that a telegram be sent to the Secretary of the Admiralty. It cannot be too strongly or clearly stated that no violence had been offered to Rajah Madie or his men when Lieutenant Maude's party was attacked. On the 4th, at 4.45 a.m., weighed and proceeded alone, under steam, for Salangore River. I knew that it was touch and go whether we could get over the bar (more than two miles in width at the top of high water); that we had no chart of the river, that we had no surgeon on board, that it would be twelve hours before we could get out again, and that for the whole of that time we might be under fire, yet took the responsibility of incurring all risks for the sake of punishing the pirates for their treacherous attack yesterday, and for the sake of teaching them to respect the flag for the future. According to 'Horsburgh's Sailing Directions' this has always been a piratical haunt, and no doubt they felt themselves secure in the strength of their position. At 6.16, when about 400 yards from the forts on the southern entrance of the river, fire was opened on us from these forts and from those on the northern bank. It was a hot and well-directed fire, and was, of course, immediately answered by the *Rinaldo;* in less than five minutes we had three men wounded and had suffered severely in hull and rigging, but by steaming past their batteries into the river their position was turned, and before they could get most of their guns round we had either dismounted them or rendered their chief defences untenable. At 6.40 anchored in 3½ fathoms in the centre of the river, off the town of Salangore, laid out an anchor astern to keep gun-bearings on forts. This service was done under fire by Mr. Rickard, boatswain. About eight, the enemy was driven from all his guns. I then ordered each gun to fire once every quarter of an hour to prevent him from re-opening his fire, and this practice was regularly kept up during the day, except when we saw him trying to man a gun, when two guns would fire till he withdrew. A fire of musketry was directed at us from time to time, as the river is barely half a mile broad. At 10.38 ship grounded in soft mud, happily with her broadsides bearing in the proper direction. Had the fort on the hill commanding the town possessed powerful guns we should now have presented a fair mark at 700 yards distance, for they might have sent a plunging fire upon our upper deck, the whole of which must have been visible to them; but they could do nothing against the superior power and accuracy of our guns. At 11.40 the ship was in 11 ft. of water, our draught being 15 ft. 4 in. At 2.30 flood tide making up strong, ship dragged best bower anchor, let go small bower. At 3.5 ship swung to tide, weighed port anchor; 4.30,

weighed starboard anchor; 4.30, weighed kedge and steamed out of river: 5.30 ceased firing, having silenced all the forts and partially burnt the town and houses on opposite bank; at 6, anchored in roads to wait return of *Pluto* from Penang. It may be asked, why, after silencing the forts, we did not land and destroy the guns. The reply is, that although they were driven from their batteries they remained concealed in the jungle, which surrounded them on all sides, and that I did not feel justified in sending my men to be shot down by a concealed foe. There were, I am glad to say, but three men wounded on our side—viz., George Lucas, quartermaster; John Haskins, boatswain's mate; and Edward Bush, A.B.

"Enclosed is a report from the boatswain and carpenter, from which it will be seen that the fire was both well-directed and heavy. It was a hard day's work, and it is very gratifying to me to be able to say that every officer and man did his duty well. I had the greatest assistance from Commander H. N. E. Grey, R.N., your private secretary, who happened to be my guest for the cruise, and who, when his advice was requested at critical times, gave it with remarkable self-possession and good judgment. Commander Grey remained on the bridge the whole of the time we were under fire. What I have to say of the officers and men of this ship I hope you will see in my despatch to the Secretary of the Admiralty. The *Pluto* returned yesterday at 4.30 p.m. from Penang with the troops as per margin. (Detachment Royal Artillery: 1 lieutenant, 3 non-commissioned officers, 1 trumpeter, 17 gunners. Detachment 19th Regiment Madras Native Infantry: 2 native officers, 10 non-commissioned officers, 1 bugler, 100 privates, 2 water-carriers, 1 Lascar. Medical Department: One staff assistant-surgeon.) The Hon. Arthur Birch, Lieutenant-Governor of Penang, had generously sent the whole of his disposable force. These troops were under the command of Lieutenant-Colonel Shortland, 19th Madras Native Infantry, whose report upon the proceedings of the day is enclosed. Shortly after the *Pluto* anchored there was firing from the forts, as if they were getting the range of their guns. We all expected a stubborn resistance this morning, but were mistaken. The punishment we gave them on the 4th proved enough.—I have the honour to be, Sir, your obedient servant, GEORGE ROBINSON, Commanding R.N., and senior officer of the Straits Division."

"P.S. Five piratical war proas were burnt, three with 24-pounders and one small gun each. All had arms—viz., spears, muskets, etc. They measured from 80 to 100 tons apiece."

YACHTING IN CANADA.—The yachting season, so far, on Canadian waters, has been rather quiet, greater interest having been taken in the rowing regattas, from the fact that they were denominated international affairs. The Royal Canadian Yacht Club have on their list seventeen boats, and number about 300 members. Their house, built out on the Bay of Toronto, is a very neat affair, the first floor containing yacht-owners' rooms for storing sails, furniture, etc., when not in use: care-keepers' and stewards' rooms, etc. The second floor has large billiard rooms, smoking, reading, dining, card and club rooms, all very large and comfortably furnished. A balcony extends around three sides of the house, affording a beautiful view of Lake Ontario and the harbour, with its shipping. The annual race of the Club for a handsome Club Cup, presented by the Prince of Wales on his visit to Toronto, took place on the 16th ultimo, and was the race of the season. The course is generally across the Lake, and back—a sufficient run to try, in heavy weather such as we generally have in September, the sailing qualities of the yachts. The following is a list of yachts belonging to the Club: *Rivet Iron*, 16 tons; *Geraldine*, 28; *Dart*, 14; *Osprey*, 10; *Mystic*, 46; *Falcon*, 16; *Brunette*, 18; *Glance*, 10; *Viking*, 40; *Mona*, 15; *Ida*, 15; *Kestral*, 16; *Water Lily*, 6; *Undine*, 17; *Grillia*, 28; *Jephyse*, 18; *Ripple*, 28; *Fawn*, 28; *Wideawake*, 8. The Bay of Toronto in the Summer time affords a splendid place for boating and sailing, being well protected against heavy seas and wind, except from the eastward, whence a heavy ground swell is apt to roll in. Hamilton, forty miles distant, possesses some very fast yachts, but the bay is not so well adapted for sailing as the Toronto Bay here is; still their races are very creditable to the Club.—*Nautical Gazette of New York.*

A DANGEROUS ROCK.—Several times, since 1863, a dangerous rock has been reported about 80 miles S.S.W., or S.W. of the S.E. Farallone Light. In the winter of 1868 this locality was as thoroughly examined by the Coast Survey as the weather would permit, no less than four examinations being made that embraced an area of 1,800 square miles, with very numerous soundings, from 100 to 300 fathoms, no bottom, and no indications of shoal water. But, as a warning to navigators, the opinion was then expressed that such rocks might exist, because isolated, sharp-pointed rocks are difficult to find under the most advantageous circumstances. From Capt. ARCHIMANDRITOFF, commanding HUTCHINSON, KOHL and Co.'s bark *Cyane*, Prof. DAVISSON has received a letter, dated Kodiac, August 10th, with the following information: "June 17th, reports

shoal, appearance of water dark and breaking, 90 miles S.W., by compass, from Fort Point. Sounding one quarter mile distant, 100 fathoms."

AN AMERICAN LIGHT-SHIP ADRIFT.—The captain of the Martin's Industry Light-ship reports: "At ten o'clock on the 18th, during a heavy gale, the ship parted her chains, when sail was immediately made, and the boat headed to seaward to avoid the shoals off Tybee. At four o'clock a.m. of the 19th, sprung foremast head, also forestay stranded, which compelled the shortening of sail and heaving to under close reef mainsail, in which position the ship drifted to the southward and eastward until the 21st at four a.m., when temporary backstay was rigged, with lantern chains running to each quarter, which secured the foremast. The weather moderating, sail was made with head to northward; then got the first meridian, and discovered the ship to be in lat. 30° 24′. At eight o'clock on the evening of the 21st similar weather set in, when the ship was again hove to under the same sail until four a.m. on the morning of the 22nd, when the wind coming more to the southward, sail was made and ship headed westward."

We learn that this vessel was replaced by another light-ship as soon as intelligence was received of her being away from her station.

WATERSPOUT ON THE SOUTH COAST.—On the 8th August a waterspout was seen between Bournemouth and Poole Harbour. A correspondent to a contemporary thus describes it:—

"The sky and horizon had for some time worn a very curious appearance, and we had scarcely turned to row into the harbour before one of the men pointed out a whirlwind, forming a steam-like column of spray and travelling rapidly towards land. We watched it till it went ashore, raising a cloud of sand and dust close to the end of the Branksea property, at which point is a small round tower on the cliff. Another whirlwind of larger dimensions was now descried, following nearly the same course, and to meet this a very distinct and well-defined cone descended from the clouds above; but before the cloud and the water actually formed a junction the shore was reached, and the cone immediately dispersed. We shortly reached the entrance of the harbour, and the rest of our sail was in smooth water. The breeze held till near sunset, when it fell dead calm; and on our return we were obliged to land at Poole and drive home, the men all prophesying that a heavy gale was coming."

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FOG-SIGNALS.

THE subject of fog-signals is undoubtedly one of increasing importance as affecting the safety of navigation. Whatever may be the progress made in lighthouse science or in meteorology, and whatever degree of accuracy may be attained in our charts—still the fog baffles us, and as it creeps over the face of the sea enshrouding the mariner in its bewildering grey pall, it brings with it an obscurity which is worse than the blackest midnight, an obscurity which deadens all things, even the intelligence and energies of the most fearless navigator. To obviate to some extent the perils incident to navigation when this insidious enemy hangs over the sea, numerous efforts have been made to introduce warning signals to be used, but as yet they are lamentably deficient for the purpose. There is plenty of scope for science to improve on the present means of signalling, or to discover some means by which the danger of travelling in fog may be lessened. At present we are powerless when the fog envelops us, and we sadly want the rays of science to illuminate us in our darkness.

It was therefore with considerable satisfaction that we noticed that a paper was read in March last at the Institution of Civil Engineers, by Mr. Alexander Beazeley, M.Inst.C.E., on "Phonic Coast Fog-signals." In our April number we gave a short précis of Mr. Beazeley's observations, but having been recently furnished by the author with a copy of the paper *in extenso*, together with a report of a discussion that followed, we take the opportunity of

making a few comments on the paper, and of referring briefly to the existing state of things as regards fog-signals generally.

The most powerful light has been found to be of little or no use for signalling in fog, whether from the shore or from the decks of vessels. It has been said that some kinds of light will pierce the thickest atmosphere, or will so illuminate the vapour that for purposes of indication they would be efficient fog-signals; but practical experience does not bear out these anticipations. The most brilliant rays are found to be choked and rendered useless, almost as soon as they enter into the obstructive medium.

As regards the power of sound, the only other means of conveying a signal through fog, our knowledge is neither so extensive nor so reliable as might have been expected from a maritime nation. Mr. Beazeley observes that "It is not a little surprising that, except of late years, the subject of fog-signals for the guidance and warning of the mariner should have received so little attention; and that, with the exception of a few inventions of recent date, the knowledge of the present day respecting the means of producing and projecting to a long range the sounds to be employed, is but little in advance of what it was a century ago. The literature of the subject is extremely meagre; here and there, scattered among the scientific records of this and other countries, an occasional notice or a brief suggestion may be met with; but of systematic research and experiment, and their proper offspring, practical result, there are few traces." But nevertheless we are not altogether in the dark on the subject, and Mr. Beazeley seems to have devoted a great deal of time and attention to discovering what has been said or done with regard to sound-producing instruments for signalling in foggy weather. He enumerates the instruments in use as fog-signals, viz., gongs, bells, guns, whistles, and trumpets, and gives a short history of the adoption of each, and states its particular value. Gongs are chiefly used for light-vessels on the English coast, they are not very powerful fog-signals, but as the sound from them is diffused equally all round, can be heard at a distance of half a mile and is characteristic and distinctive, the gong is well adapted for a light-vessel. Of bells, Mr. Beazeley has more to say. He details the results of experiments made by certain French engineers, by the Trinity Board, by the Irish Lights Commissioners, and in the United States, all of which tend to shew that the average range of the sound of bells of the best description is not much more than one mile across a light breeze. As regards guns, Mr. Beazeley says that "apart from considerations of safety and convenience, they must be admitted to be in some cases efficient

as fog-signals." Mr. Beazeley states that he himself has frequently heard the gun on Lundy Island, at Hartland Point, a distance of ten miles. We can quite believe that the gun is a good signal, and that its sound will travel to a great distance; but there are many reasons why guns should not be generally adopted as fog-signals. They would be liable to be mistaken for distress signals, no distinctiveness could be imparted to their sound, and mariners would not be able to tell where they were, if many such signal guns were placed about the coast; moreover their use at any time would be attended with inconvenience and danger. They may be and are used with success in particular cases and for special purposes, such as signalling to mail steamers, and to indicate the position of isolated and dangerous neighbourhoods.

There is a great deal of interesting and valuable information brought together respecting whistles. Mr. Beazeley remarks, that "the sharp and piercing scream of the hemispherical or locomotive whistle possesses in a very high degree the quality of intensity as compared with volume, which is considered essential to a thoroughly efficient fog signal." He then gives particulars of the various kinds of whistles which have at different times been brought out for fog-signal purposes, and the experiments which have been made with them.

As regards the whistle sounded by compressed air, and brought out by Mr. C. L. Daboll, of the United States, the following extract will shew that it possesses no ordinary merits.

"One of these machines was erected by order of the United States Government, at Beaver-tail Point, near Newport, R.I., in 1851. It had a condenser of 225 gallons capacity, filled by two air-pumps 3 inches in diameter, and 8 inches stroke, worked from a cranked axle driven by simple gearing, and moved by one horse. The condenser could be filled to a pressure of from 40 lbs. to 50 lbs., in 7½ minutes by slow gearing, and in 4 minutes by fast gearing, and the whistle sounded once every 3 minutes. It was estimated by Captain Walden, who made an official examination of the apparatus, that, in order to maintain a regular series of signals, it would require the work of one horse during one-third of the time over which the signals extended [or at the rate of one-third of a horse-power per hour].

"The testimony as to the efficiency of this whistle is abundant and favourable. During dense fogs (wind not stated), it was distinctly heard at from 6 miles to 8 miles in the town of Newport, even when there was considerable noise of drays and carriages in the streets. It was distinctly heard in the same town at 6 miles in

dense fog, against a light breeze, early in the morning, when there presumably was but little noise in the streets; and at Jamestown, distant 5 miles, in foggy weather, with the wind (strength not stated) blowing across the sound. Captain Walden heard it distinctly at a distance of 2½ miles, in a rough sea, and with a strong wind blowing across the sound. The President of the United States Lighthouse Board bears testimony to its efficiency as a signal, from personal observation. He says: 'The early part of the night was clear, but as the steamer approached the east end of Long Island, and the passage between Beaver-tail and Brenton's reef, the fog became so dense that navigation would have been extremely hazardous without some better guide than the compass and lead; and this was found in the whistle, which sent its clear and shrill notes far over the water, indicating the bearing of the point on which it is placed, much more accurately than a bell or a gun would have done, and enabling the steamer to arrive, with little loss of time, at her port.'"

Another whistle sounded by superheated steam, invented by Mr. T. T. Vernon Smith, of St. John's, New Brunswick, is also described. The special advantages claimed for this whistle are:—

"1st. The employment of high-pressure or superheated steam for sounding a whistle as a telegraphic signal at sea, operated upon by machinery at certain intervals of time, so as to signal not only by the note, but by the interval between the notes. 2nd. The employment of two or more whistles, thus operated upon, to give an identity to the locality in which they are used, and to prevent the confusion with other signals. 3rd. The use of reflectors to concentrate and intensify the sound of steam-whistles, and tubes to conduct the same in different directions."

The apparatus of this machine is extremely simple. The boiler is vertical and tubular, surmounted by a steam-chest or dome for superheating the steam. Connected with this is a whistle or whistles, from 5 inches to 6 inches in diameter, sounded by clockwork, or other suitable automatic movement, for opening the valve of the steam-pipe at regulated intervals.

The testimony from numerous quarters as to the efficiency of an apparatus of this kind in operation at Partridge Island, New Brunswick, is really remarkable.

As far as whistles are concerned, we are of opinion that there is much to be hoped for from them as efficient and distinctive fog-signals. The shrill sound of the whistle is one that can be heard above the roar and hurly-burly of a tempest, or any other mixture of noises which are experienced at sea; and we are inclined to

believe that this source of sound can and will be still more developed, so as to prove most effectual for signalling in fog. The difficulty at present is to concentrate the sound and prevent its dispersion in the air all round, by which much of it is wasted, and that portion which finds it way to sea is not so powerful as it might be made. Mr. Thomas Stevenson, in the new edition of his work on Lighthouse Illumination, suggests a plan for concentrating the rays of the sound and projecting them in one beam in the direction required. This is the particular merit of trumpets or horns, the mouth of the instrument forming a holophone, the principle of which Mr. Stevenson thinks might with advantage be applied to whistles. We are, however, of opinion that great difficulty will be experienced in focussing the sound of a whistle. This holophonic quality of trumpets or horns has caused them to find much favour of late for purposes of signalling in fog. Mr. Beazeley gives a full description of the trumpet of Mr. Daboll, which has been in successful operation both in England and America. The trumpet is sounded by air condensed by an Ericsson caloric engine, and is made to rotate, so that the sound is distributed to all parts of a given arc.

Mr. Beazeley says:

"The rotation of the horn is a feature of great importance where only one is employed, as it permits the axis of the mouth to be directed to every point of the horizontal arc over which it is required to act, and thus to distribute the sound as it moves."

We do not altogether agree that this rotatory movement is desirable. Different conditions of wind would make this system very irregular and unreliable. It seems to us that any sound projected to leeward is utterly wasted, and with the wind blowing along shore, a vast quantity of sound must necessarily be projected to leeward as the trumpet rotates. Rather we would say, let the whole strength of the sound be projected to windward. It is obvious that by this means the best results would be obtained against the wind, and to leeward the sound would simply be distributed in a natural way. Besides a vessel to leeward of the danger to be marked, would in all probability not be in such need of a fog-signal as one to windward. We trust the authorities will institute more experiments with a view to determining how sound may be projected to the greatest advantage under the varying influences of wind and weather.

Professor Holmes has devised a trumpet which embodies the latest improvements, and Mr. Beazeley thus describes an apparatus of his recently erected at the new lighthouse station at Souter Point: —

"The condenser and trumpets are situated at a distance of about 350 feet from the air-pump, which is driven by the steam-engine employed for the generation of the magneto-electric current for the light, the air being conveyed to the condenser by a 2-inch cast-iron pipe. The trumpets, two in number, will be placed with the axes of their mouths at right angles to each other, so as to emit their sound over an arc of 180°, corresponding with the illuminated arc of the light. They will be sounded simultaneously at intervals of thirty seconds, by the following contrivance, which is another of Holmes's improvements. The only communication between the condenser on which the trumpets are fixed, and the engine-room, is the pipe which conducts the air; and, as soon as the pressure in the condenser rises to 30 lbs. per square inch, a tumbler is automatically thrown over, and the valve admitting the air to the trumpets is suddenly opened. When the pressure is reduced by the blast to 28 lbs., the valve is as suddenly closed by the tumbler falling over in the opposite direction, and the valve remains closed until the pressure again rises to 30 lbs. The intervals between the blasts are regulated by simply changing the capacity of the condenser, by pouring in more or less water, so that the air-pump shall require less or more time to recover the 2 lbs. of pressure expended. This ingenious contrivance obviates the necessity of using rods or wires for working the trumpet at a distance as proposed by Daboll; but it is a question of some interest, whether the air in the condenser may not become so charged with moisture from the water employed, as to be prejudicially affected by severe frost."

"In order to utilize the whole of the sound, a considerable portion of which would be sent upwards at too great an angle, owing to the large phonic arc of the improved trumpet, Professor Holmes proposes to employ a kind of sounding-board, to be placed above the mouth, to send out the rising sounds in a horizontal line."

In concluding his remarks on the whole subject, Mr. Beazeley observes, that "it will be perceived that the whistle and the trumpet stand out prominently as regards power and manageableness."

Further on he alludes to the uncertainty of all existing signals in a heavy gale; he says:—

"The howling of the wind; the groaning and creaking of hull and spars; the shock and roar and thunder of the sea; the drenching, blinding spray, driven like a concentrated battery of hail; the fierce blast, cutting like a knife, and striving as it were to stifle and beat back even the attempt to breathe; the thick mist, closing everywhere around, and shutting in the ship as if to be the solitary

mark for all the wrath and savagery of the elements;—these are the antagonists against which the fog-signal has to try its powers; and powerful indeed must be its voice if it affords in time a friendly warning."

He then somewhat to our surprise advocates the plan of so regulating the sound of the signal where it is attached to a light-house station, that it may correspond with the characteristics of the light.

We must confess we fail to see how such an arrangement could be made at all reliable, or indeed carried out with any degree of success. The many disturbing conditions alluded to by him which would influence sound in its passage on to the sea, it seems to us, would render it next to impossible to make sure of certain sound signals made on land, reaching the mariner out at sea in the same condition as they left the sound instrument. To us it seems most likely that some of the conditions above named, or others which might exist under other circumstances, would so influence the sounds in their transit, that they would reach the seaman distorted or weakened beyond recognition.

We cannot conclude our remarks on this subject without expressing our thanks to Mr. Beazeley for his really valuable contribution to the literature of a subject of the highest importance to us as a maritime nation, and we earnestly hope it will awaken discussion and scientific investigation.

SUBMARINE DIVING AND DIVING APPARATUS.

As far back as the reign of Alexander the Great, divers were employed for various purposes of war or peace—to destroy the enemy's vessels and fortifications, or to recover sunken treasure.

The earliest and simplest contrivance for prolonging the natural stay of a man under water was to put a piece of sponge soaked in oil in the mouth, and attach a stone or piece of metal to the body to keep it from rising. The oily sponge prevented the water from entering the mouth, and it is said, that by this arrangement the divers of Astracan could remain under water six or seven minutes. They were, however, much exhausted on coming to the surface—

blood flowing from the nose and ears. There are, however, no reliable accounts of the mechanical means employed for diving (although such were undoubtedly used) until the Seventeenth Century, although the celebrated Friar Bacon is said to have invented a species of diving bell about 1250. It is also chronicled that two Greeks descended into the water at Toledo before the Emperor Charles V. and 10,000 spectators, and Vegetius in his Art of War, published in 1511, mentions a diving apparatus then used.

Every one has heard the tale of Nicolo Pescè, the King of Sicily's diver, who plunged into the horrible gulf of Charybdis. He returned once, but being persuaded by the king to venture again, he plunged in and never emerged.

About 1620, one Debrell contrived a submarine boat to be rowed under water. It was tried on the Thames by order of James I., and is said to have been very successful. Boyle in his "New Experiments Physico-Mechanical" says that Debrell employed a liquid which "speedily restored to the air its vital parts and made it fit to breathe again."

The Landgrave of Hesse Cassel had one made on the same model. It is described (with a diagram) in the "Gentleman's Magazine" for December, 1747. We believe it is not generally known that the original inventor or proposer of the torpedo, which now is daily growing in importance as a weapon of defence and offence, was the Marquis of Worcester in 1663. In his "Century of Inventions," proposal 9, is "a ship destroying engine, which may be carried and fastened to the greatest ship and at any appointed moment, either day or night, it shall irrecoverably sink that ship."

Borelli, in 1669, made a "vesica" or bladder, which was, in fact, a copper vessel fitting over the head with glasses for the eyes, and a system of pipes to the surface to convey air to the diver; thus equipped, and with artificial webbing to the feet, it was believed that a man might vie with the fishes under water.

Mersennius, of Amsterdam, in 1671, proposed a submarine boat similar to Debrell's. Nicholad Witsen, in the same year, also propounded a scheme. Both these projects failed however like all their predecessors. About this time many persons entered into expeditions for recovering treasures lost in wrecks. Few of these succeeded. The Duke of Argyle, and many other noblemen, joined in the mania, and examined by divers the wreck of a vessel belonging to the Spanish Armada, sunk off the Isle of Mull 1588, supposed to contain immense treasure. Owing, however, to the imperfect apparatus employed, they were unsuccessful.

The most remunerative adventure of this kind during the seventeenth century was that undertaken by one Phipps, a ship's carpenter, and son of a blacksmith in Boston, America. He began to operate in 1687 with an apparatus (the character of which is now unknown) upon the wreck of a Spanish galleon, lying off the coast of Hispaniola; but what he then recovered did not repay his outlay. Nothing daunted, he determined on trying again, and assisted with money (though most usuriously) by the Earl of Albemarle, son of the well-known General Monk, he eventually, but with much difficulty, rescued property of the value of £300,000, of which sum he received about £20,000 for his own share. In other ventures he was equally successful — he was afterwards knighted — became Sheriff of New England, and founded the present noble family represented by the Marquis of Normanby.

Dr. Halley in 1716 read a paper before the Royal Society, embodying his views on submarine engineering, entitled the "Art of Living under Water."

About the same time, Nathaniel Symonds, of Harburton, made a sort of diving bell, in which he sank himself in the river Dart before many hundreds of persons. He complains, with evident disappointment, that "though a great number of gentlemen were present, he received but one crown piece from them all."

Passing over various attempts, we come to Smeaton's apparatus, invented 1779, and used for repairing Heaton Bridge, in Northumberland. Smeaton was the first who employed a diving bell for civil engineering operations. He also constructed Ramsgate Harbour in 1780, by means of his bell. Mr. Rennie subsequently made great improvements in it, and used it at the works of Howth Harbour, Dublin.

Messrs. J. and W. Braithwaite were very successful in some of their diving operations. The apparatus they employed was the invention of Mr. J. Braithwaite. From the wreck of the East Indiaman, *Earl of Abergavenny*, they recovered nearly all the cargo and £75,000 in dollars. The vessel was lost in 1805, and had been in ten fathoms of water sixteen months. The recovery of the cargo of the ill-fated *Royal George*, is among the most interesting operations performed by divers. The *Royal George* went down in August, 1782. About a month after, Mr. Tracey commenced operations, but these after being continued for three seasons unsuccessfully, were abandoned. The expense incurred amounted to £12,000, and was shared between the government and Mr. Tracey. Nothing further was done till June, 1817, when Mr. Ancell, of the Portsmouth Dockyard, surveyed the wreck, partially by means of a

diving bell. Matters again rested seventeen years, and in 1834, Deane, with an apparatus originally intended to recover property from burning houses, brought up twenty-eight guns and portions of the wreck.

Operations were resumed in 1839 under the direction of Lieut.-General Sir C. Pasley.

The wreck was finally cleared away by 1843. The consumption of gunpowder during the operations was 52,963 lbs. There were recovered no less than 581 cwt. 2 qrs. 14 lbs. of various metals (exclusive of eighty-six guns) and 59,000 cubic feet of timber. It may be remarked, as somewhat curious, that of all the money which must have been on board at the time of the catastrophe (when 1200 persons went down) only two guineas were found. But perhaps the most singular incident is, that an actual fight took place below water between two divers for the possession of some portion of the wreck claimed by both; in the scuffle the glasses of one of the helmets were broken, and the diver nearly drowned before he could be rescued.

The operations on the wreck of the *Royal George* gave a great impetus to diving, and many eminent scientific men turned their attention to improving the apparatus then in use.

Dr. Payerne, a French savant, invented a diving machine that was very successfully tried at the Polytechnic Institution, and afterwards at Spithead. He employed compressed air which was conveyed down with the bell in cylinders in place of being pumped from above. It was used by the French government at the building of the fortifications at Cherbourg, but has since given place to the more compact and practical helmet diving apparatus. That formerly manufactured by the late Mr. W. Heinke, and now by Messrs. Heinke and Davis, of 2, Brabant Court, Philpot Lane, is universally acknowledged to take a front rank among machines of this kind. We shall therefore proceed to describe it, and to shew the manner in which it is used.

The helmet, which is made of tinned copper, consists of two parts, the head piece and the breast plate. These are joined together by a segmental bayonet joint, which enables the head piece to be firmly screwed on the breast plate in one-eighth of a turn.

In the head piece are three eye glasses in brass frames for the diver to see through. The glass is very strong, being three-quarters of an inch thick, and will resist a violent blow. At the back of the head piece is a nozzle to which the hose is fastened, the hose in turn is attached to the air-pump. In front of the breast plate is the main valve for regulating the supply of air. A patent has been

taken out for this which is the great feature of the apparatus we are now describing. By it the diver himself can, whilst under water, regulate his supply of air, so that he is perfectly comfortable when working. To obtain this desideratum has been the great aim of all previous apparatus. There is also a supplementary valve that can be opened or closed at will under water, to assist the main valve. The most valuable property of the main valve is the security it affords from danger. Should the diver tear his dress or break a glass of his helmet, by turning off his valve, he prevents the water entering his dress and drowning him. He can also rise to the surface of the water with all his gear (weighing upwards of 200 lbs.) and sink again at pleasure merely by turning the valve off and on. By closing his valve he is also safe if any accident should happen to his air hose, as by that means he keeps sufficient air in his dress to last him five or ten minutes, thus giving time to ascend.

The diving dress is made of strong tanned twill with a thickness of India-rubber between the cloth. It is all in one piece, and is provided with vulcanized cuffs and a vulcanized band or collar to fasten on the helmet, with metal bands and fly nuts, thus forming a perfectly water-tight joint. The diver wears a suit of flannels under this dress, and a woollen cap on the head. On his chest and between his shoulders are weights of lead each weighing fifty-six pounds. Besides these he has boots with leaden soles each weighing sixteen pounds. A belt supporting a knife is buckled round his waist, and under his arms is the life or signal line, by which he makes known his wants to his attendant by so many pulls.

The air pump made by Messrs. Heinke and Davis, is of peculiar and improved construction. It will supply the diver with air at depths varying from ten to one hundred and fifty feet. By means of a recent improvement it can be also used as a fire engine and will throw a stream of water about forty feet high. This renders it well fitted for use on board ship. It also forms a water pump, an exhaust pump, and a force pump. It is fitted with a guage which shews the depth the diver is working at, and also the pressure of air.

The use and value of diving apparatus is becoming more known every day. For building foundations of bridges, harbours, breakwaters, etc., it is invaluable, and without it the recovery of sunken treasures and cargoes would be impossible. It is extensively used for pearl, coral, and sponge diving, repairing lock-gates and walls, laying and removing mooring stones, etc. Also for repairing and examining leaks in vessels whilst at sea, cleaning

the sides from barnacles, freeing the rudder and screw propeller from weeds; in fact the uses it can be put to are almost innumerable. It would also prove a formidable means of offence in laying torpedoes, and of defence in seeking for them.

In connection with this subject we may here draw the attention of our readers to a new submarine electric lamp, invented by Messrs. Heinke and Davis, and which gives a most brilliant light under water, possessing an illuminating power equal to 15,000 or 20,000 candles. It burns without air, thus saving the necessity of an additional air pump, and the light is produced by a battery of forty Bunsen elements. It was exhibited at the Polytechnic Institution, Regent Street, and the following extract from the *Times* of October 3rd, 1871, will explain its construction:—"Messrs. Heinke and Davis, of Brabant Court, Philpot Lane, have added another item to the list of attempts to solve the problem of submarine illumination, and we believe are entitled to the credit of having gone beyond preceding experimentalists. The means by which they have obtained this consummation may be briefly described. The lamp employed consists of a system of electro-magnets, and carefully adjusted levers. The action of the electric current attracts an armature of soft iron, which in its turn sets the levers in motion, and gently moves the carbon points towards each other as they burn away. The action of the levers on the current is made and broken by a small induction coil. The whole lamp is contained in an air and water-tight glass cylinder, an arrangement being made for exhausting the same, thus enabling the light to burn in vacuo.

"When the lamp is under water there is no communication between the interior and the air above, the light is entirely independent of oxygen for its illuminating power. The effect of the exhibition is certainly pretty, especially if viewed after dark."

There is no doubt that this light will be of immense service in submarine engineering. It will greatly facilitate the operations of the diver engaged in removing wrecks from the way of navigation, and will be invaluable to him among the dark holes and corners of a ship, when his object is to recover articles of value. Again, for laying foundations for lighthouses, breakwaters, etc., the use of this lamp cannot be too highly estimated.

STORY OF A HAUNTED SHIP.

Some years ago, having suffered in health from a too close attention to business, in one of our inland towns, I was advised by my medical attendant to visit the sea-side village of Tynemouth. I spent the first week of my sojourn at the sea-side very agreeably, rambling along the sands, admiring the beautiful sea, and occasionally chatting with the rough north country boatmen. Very interesting it was to while away the summer days amongst the ruins of the old abbey, reading the quaint inscriptions on the tombstones which nestle in the shadow of the old walls. It is not very easy for a person accustomed to an active life to subside at once into idleness, and I soon began to tire of Tynemouth, beautiful though it is. I began to extend my rambles to North Shields, and spent many hours on the bank of the river, near the lighthouse, watching the ships passing into and out of the harbour; sometimes as many as a hundred sail would pass out to sea in an hour or two; many of them bound to far away regions. Doubtless some of them would never return, but would leave their timbers to bleach on the shores of distant lands; or perhaps founder in the deep sea, far from the shore, and become coffins for their crews.

I think that the principal events in the lives of seafaring men must be meetings and partings. The good man comes home off a long voyage, enjoys a pleasant meeting with his wife and family, and a few short weeks of domestic happiness, and then takes his departure to sea again. Or it may be, instead of a joyful meeting, which he has been looking forward to on his return, he finds that death has knocked at his door, and taken away some of his loved ones, and that there is nothing left to him in this world but one or two green hillocks in the graveyard.

As I was resting on a seat in front of the lighthouse on a fine afternoon, musing on the uncertainty of a sailor's life, my attention was called to a group of elderly seafaring men who were discussing the relative merits of two ships which were just then passing down the river to sea. A bluff looking stout old gentleman appeared to be the "Sir Oracle" of the party, his opinion being received with deference by the others. He wore a broad brimmed hat, a dress coat buttoned tightly across the chest, and a pair of grey trousers. His face was weather-bitten and bronzed by exposure, but the merry twinkle of his clear blue eye, and the smile upon his good-humoured face showed that the hardships of a sea life had not

made much impression upon him. His appearance interested me so much that I enquired his name of one standing near, with whom I had a slight acquaintance. He told me that Captain Treenail was the name of the old gentleman, and that he was the best hand at "spinning a yarn" in the north. At my request I was introduced to Captain Treenail, and he and I soon became very friendly. I had the pleasure of listening to many a thrilling story of the sea from his lips; and I will endeavour to repeat one of them as near as possible in his own words.

During the height of the Australian gold fever I was appointed to the command of the *Lord Clive*, a ship of a thousand tons, which was then loading in the London Docks, and bound for Sydney. She was a bluff-bowed bruiser of the old school, built of teak at Bombay, with high poop and topgallant forecastle, and had been employed for many years in the country trade between Bombay and China. During one of her voyages to the East her crew of Malays mutinied, with the intention of murdering the captain and officers, and running away with the ship to one of the solitary islands in the Sulu Sea. The mutineers were, however, overpowered; nine of them were shot down in the fight, and the ringleader was hanged at the fore yardarm, as a warning to the rest. When I went on board to see the ship her appearance was certainly not prepossessing; her cabins were gloomy and dark, overrun with rats and cockroaches, and everything about them dirty and neglected. Sailors are usually not very particular about the appearance of their ships while in dock, as it is impossible to keep a ship tidy and clean while the labour of loading or discharging cargo is going on; but the *Lord Clive* was certainly the ugliest and dirtiest ship that I had seen; had it not been for the thought that there were six little Treenails at home all looking to me for their support, I would certainly have resigned my command, and sought employment elsewhere; but when a man is hard up, he must do many things that he would never think of doing when he has a good balance at his bankers; and so I resolved to make the best of it, and to do what many people do when they are desperate, —trust to Providence.

As soon as the loading of the ship was finished I set about shipping a crew. A placard was put up in the shipping office, setting forth that Captain Treenail of the *Lord Clive* would be at that place at noon of the next day to ship a crew of twenty-five seamen, with the usual proportion of officers. Next day, on calling at the office, I was surprised to find that not a man had come forward to ship, although there were plenty of men knocking about.

I accosted a smart sailor-like man, and asked him to go as boatswain, "What ship, sir?" said he, "The *Lord Clive*," "No, sir," he replied, "I would not go in the hanging *Lord Clive* if you would give her to me at the end of the voyage." I managed at last to pick up a crew, but they were a very indifferent lot. The only man I could trust was Tom Brown, my chief mate, who had sailed with me for many years, he was a thorough sailor, true as steel, but rather superstitious withal, and a firm believer in sailors' yarns, such as the "Flying Dutchman," and the "Phantom Ship." Down on a lee shore, or in a squall with the ship on her beam ends, Tom had nerves of iron, but where anything supernatural was concerned he was no better than a sucking baby. I was very glad when I got the ship fairly out of the Channel into sea-room; for knocking about in narrow navigation is always an anxious time for a shipmaster who values his reputation. Shortly after clearing Scilly we encountered a very heavy gale of wind, and, in consequence of the incompetency of my second mate, I was a great deal on deck. One night, in the middle watch, we were hove to under a close reefed main topsail, I was walking the deck, smoking my pipe, and looking out to windward for homeward bounders; it was the mate's watch below, and he had turned in for more than an hour, when I was surprised to see him come up the poop ladder, his face pale as a sheet, and trembling like an aspen. Before I could question him as to what had happened, he exclaimed, "Lord a' mercy, there's something wrong with this ship." He then told me that he had been awoke out of a sound sleep by hearing deep groans in the cabin, and on opening his eyes had seen a black figure fly past his cabin door, and vanish out of the stern windows. "Tut, Mr. Brown," said I, "you know that there never was a ghost seen on board ship in more than seven fathoms water," alluding to a well known notion amongst sailors, that ghosts invariably leave a ship far from land. Tom however sturdily refused to go below again, and walked the deck with me till four o'clock. At eight bells I went below and turned in, and was soon asleep; I was, however, aroused by a heavy sea striking the ship, and falling with a loud thud on the poop deck, over my head. I lay awake for some time listening to the swash of the water against the sides, to the creaking of the bulkheads, and to the loud shrieking of the wind through the blocks and cordage. Suddenly I heard a deep groan close at my elbow, and felt distinctly on my cheek a cold air, as if given off from the agitation of a fan. To say that I was not startled in that dark cabin all alone by myself would not be true, but my self-possession soon returned. As my cot

swung over to leeward with the rolling of the ship it brought my right arm within reach of a stand of cutlasses. Laying hold of one of these I resolved to punish the joker, whoever he was, that dared to play pranks with the commander of the *Lord Clive*, but I watched and listened in vain, for I was not again disturbed during my watch below. Next day the mates and steward stealthily conveyed their beds out of the cuddy into the carpenter's berth, and in future slept there. The crew were now fairly scared, the sole topic of conversation amongst them being the Malay's ghost. Accidents were continually happening aloft. The jib had burst adrift during the night and blown away, although it had been secured with double gaskets. The boatswain reported the head of the foremast sprung, and the two foremast shrouds chafed through. One man declared that while he was assisting to furl the fore topsail he saw the Malay in the lee fore-rigging with a rope round his neck, and his eyes like St. Anthony's fire. I was annoyed at hearing these foolish stories, and felt pretty sure that some person on board was trying to play tricks on the afterguard; and I resolved to keep a sharp look out, and detect and punish him.

We made sail during the day, but in the first watch of the night it came on to blow harder than before, and at eleven p.m. all hands were turned up to shorten sail, and the main topsail was close reefed, and the fore topsail was clued up and being furled. While the men were furling the sail I was surprised to see some of them descending the rigging in great confusion, leaving the bunt of the sail unfastened; I sent the mate forward to know what they meant by this lubberly action; he came back and told me that a black man had been seen on the yard arm along with the men, and that they refused to go aloft again. I ordered them aft to "splice the mainbrace," and after the steward had served out the grog, I told them how foolish it was to believe in such stories, and pointed out to them that the safety of the ship depended upon their obedience to orders. They were persuaded to go aloft again and furl the sail, though with great reluctance. When all had been made snug and the watch had gone below, I took the opportunity of lecturing Mr. Brown on his credulity; he maintained that he could not be mistaken about seeing the Malay; and told me that he had misgivings about the ship ever since the day before the gale, when he saw, amongst a flock of stormy petrels that hovered under the stern, his old messmate Jack Stevens, who was drowned in the *Lord Nelson*, when that ship foundered off the Cape and drowned all hands. "But how could you recognise your friend's likeness in a petrel," I said. He gave me no answer, but seizing my arm

in his powerful grasp, he pointed towards the lee fore topsail yard arm. The night had been pitch dark, but just then a rift in the clouds had allowed a few stars to peep out, and by their light I could plainly see the figure of a black man hanging by the neck at the extreme end of the yard arm, his body swinging to and fro with every roll of the ship. The sight was so horrible that Tom Brown fainted away at my feet, and I myself had to lean against the bulwarks for support. Breathing a silent prayer, I dashed some water out of a bucket over his face, and he begun slowly to recover consciousness. I again raised my eyes to the yard arm, but the figure was gone. Was it possible that the disembodied spirit of the dead mutineer would be permitted by a wise Providence to prowl about in bodily shape? Do the shades of murdered men, or men who have met violent deaths, haunt the scenes where they acted when alive? No, it could not be; there must be some villainous deception; and yet I saw the figure so distinctly that there could be no mistake. These and a hundred other thoughts akin to them flashed through my mind, while I felt as if I had woke up from some frightful nightmare. It was hardly possible for any person to go up or down the rigging without being seen, but I ran aloft thinking that some one might be concealed in the top; I even lay out on the yard arm and examined it, but without discovering the slightest clue to the mystery.

Affairs on board now began to look serious: the crew were as nervous as children, and I could not explain away the apparition of the yard arm. I suspected some trick, and searched the ship from cabin to forecastle. There was nothing found to lead one on the right track, but I resolved to watch closely. I slept with a loaded pistol under my pillow, determined that anyone disturbing me, whether ghost or not, should have a taste of its contents. One evening the steward had accidentally spilt some flour on the cuddy deck. In the morning I noticed unmistakeable marks of a naked foot on the floor, I knew that none of the crew went barefooted, the weather was too cold. Whose then was the footprint? It was small enough for a lady's; and no ghost left footprints behind, as far as I had ever heard or read. A light was now beginning to break on my mind; and I made my arrangements to sleep mostly in the day time and watch at night.

One night I heard the gun-room hatch creak on its hinges. There was no lamp in the cabin, but the moonlight streamed down through the skylight. By and bye I saw a black head appear above the hatchway; I covered it with the muzzle of my pistol, and with my finger upon the trigger was about to fire, but my better

reason came to my aid, and I was prevented doing an act that I might have regretted all my life. The Malay peered cautiously round, and seeing no one, made for the store-room; while I followed him on tiptoe, and seizing him from behind, while he was in the act of helping himself to some biscuit, "You scamp," I said, "how dare you play tricks on board this ship?" He was completely taken aback, and cowered at my feet with fright. I carried him to the deck, where Tom Brown seemed to be as much frightened as he was on the night when the rascal hung from the yard arm. It was amusing to watch the looks of the men, as they seemed to be uncertain whether he was really a man or a ghost. The Malay confessed that he had been one of the crew who brought the ship to London, and being of an indolent disposition, like most of his countrymen, had stowed himself away on board in order to get a free passage out. He had hidden himself amongst the bales and boxes of the cargo, taking care to keep open a communication through a bulkhead into the gun-room, thence into the cabin where he managed to pick up supplies of food which were not missed. He had however tired of his seclusion, and on dark nights had gone on deck, and even aloft. He had overheard some of the crew talking about the ghost which was supposed to haunt the ship, and knowing the history of the mutiny, he played off the trick of hanging to the yard arm by the Flemish foot rope. I sent him to assist the cook in the galley; but Tom Brown never could bear the sight of him, and he was sent adrift at Sydney.

Whenever I allude to the ghost story, honest Tom does not say much, but tells me, "if it turned out not to be a ghost, it might have been one," and, "that he has made up his mind not to sail another voyage in the hanging *Lord Clive*."

SAILS.

THE origin of the sail is hidden amongst a variety of legends and suppositions. Of these the commonest are the fable of Daedalus inventing wings by which he and his son Icarus, imprisoned in the labyrinth of Crete, flew across the Ægean Sea, and the idea that the first rude sail was copied from the nautilus navigating the Pacific by means of its two sail-like membranous tentacles. But it

is most probable that necessity suggested the thing itself to the intelligent Egyptians and Phœnicians, who are said, prior to the dawn of Grecian greatness, to have been the first to discover a method of propelling their boats by the aid of wind. There are sundry other minor fables and traditions connected with this subject. We have the tale of the Cretan prisoner's ingenious construction of sails and masts, since the sail naturally called for a pole to which it might be fastened; and thus in our constellations we have such designations as Argo and Pegasus and Perseus's whale, all names of early ships, which in honour of their inventors were transcribed to the heavens, and are shining records of vessels reputed to have been built over three thousand years ago; since Argo, the famous ship in which Jason sailed with the Argonautic expedition to Colchis in quest of the Golden Fleece, dates back thirteen centuries before the time of Christ.

The first sail, we are told, was hoisted on the sacred Nile, and was shaped out of the rind of the papyrus plant, being secured to a mast of Acantha, a species of thorny wood, which likewise supplied the planks of which the boat or bark itself was made. This primitive sail was only substituted for human labour when the wind was favourable to the course proposed, the bark being towed up the river by persons on shore. "On returning with the current," says Mr. Steinitz, "they fastened a hurdle of tamarisk across the prow of the vessel, which being let down into the water and steadied by ropes of twisted cane caused it to move forwards with greater velocity, for the reason that the stream acted with greater force on the surface of the wide-spreading hurdle, extending beyond the sides, than it could have done on the vessel itself." There are pictures of early Nile boats to be seen in the tombs at Thebes wherein they are represented as flat bottomed and having very little keel, a construction that was given them in order that they might avoid the sand-banks; these had seats for rowers and a single rudder put through the keel.

The ancients divided their vessels into three classes:

1. Vessels of war, almost destitute of sails.
2. Of burden, commonly governed by sails.
3. Of passage, towed with cords.

The Greeks at first employed only one sail, afterwards they had a top-sail, great sails, the trinket or small sail in the fore deck—not to be assimilated to the small sails of our present sail system—and the mizen sail. To these sails were attached ropes, or rather cords, fastened at the corners, by which they were contracted, dilated, or changed from one side to another, the cords being mere

leathern thongs. The crews of early Greek ships were composed of men who were generally notorious malefactors, "wicked, profligate fellows without any sense of humanity or religion," it being the practice to condemn criminals to the oar, such work being held to be the lowest drudgery and most degrading. It can readily be imagined that the wages of sin were hard enough to the crews of these Greek vessels, for the men had no place, in the brief interval allowed them from the toil of rowing, in which to rest their tired limbs, except the benches whereon they had laboured all the day.

In the time of Pliny, sails were set one above another perpendicularly; subsequently, they were placed at the prow and at the stern. From a very remote date it seems to have been the custom to dye the sails, when formed of linen, with various colours, and to decorate them with quaint effigies, or to embroider them with the name of the emperor, or the commander of the vessel. Alexander and Cleopatra were fond of costly decorations in their fleets, the former sending his ships upon the ocean with a glitter of gorgeous hues, some of his sails being, we are told, like sheets of flame; and the latter employing the regal purple dye, for such were the sails of the sumptuous Egyptian Queen at Actium.

Pirates stained their sail-cloth sea-green, probably from the fact that the colour guarded them from detection. Early Egyptian sails were renowned for the beauty of their embroidery, being painted or woven with pictures of the fabulous Phœnix, the bird whose existence is said have extended over six hundred years, and which is found inseparably associated with everything Egyptian; sculptures and temples, paintings, cornices, friezes, and at the bases of columns, an emblem of national undying greatness, an ornament to be carried on the sails of ships, typical of the country, to distant shores.

The war-galleys of the Nile reefed the sail, at the signal being given to clear for action, by means of four ropes, which were fastened to the yard dividing the sail into five folds, the ends of the ropes being attached to the mast. In Nile boats as soon as the sail, which had a yard at the top and bottom, was furled the upper yard was lowered and remained in this position until it was time to depart. To loosen the sail from the yard must have been a tedious operation, as it was bound to it with many lacings. Yards themselves in olden vessels were of immense size, almost as large as the ships which carried them, of two separate pieces, crossed and joined together in the middle, and so firmly secured that the men could stand or sit upon them whilst arranging the sail. This method of

binding the sail to the mast is not dissimilar to that used in the famous Chinese junk, the *Keying*, in which the sails, formed of stout matting ribbed at intervals of three feet by strong bamboos, were hoisted to the mast by a single rope made of plaited rattan, and of great size. This junk, the first that has ever reached Europe, or ever rounded the Cape, carried a mainmast ninety feet long and about ten feet in girth at its juncture with the deck, and a mainsail of great weight which engaged the crew two hours to hoist it.

With respect to the material from which sails have been made at different times, we have already mentioned the papyrus, from which, according to the authority of Pliny, were formed curtains, matting, ropes, and even cloth, and of which we are told was shaped that first, ancestral sail of navigation, sketched by Mr. Steinitz, as borne by the rude boat of burden on the Nile. Monsieur Jall, the historian of the French Marine, discredits the statement that the Egyptians hoisted a sail of papyrus, arguing from the fact that they were renowned throughout the world, or the known world of that period, for the excellence of their linen manufacture, and that a people who exported sail-cloth to Phœnicia could scarcely have contented themselves with a substitute so imperfect as the rind of a plant. Again, the words of Ezekiel, in the lamentation for the fall of Tyre, "Fine linen with broidered work from Egypt was that which thou spreadest forth to be thy sail," give some reason for doubt as regards the papyrus sail. In the literature of the subject we find records of one of twisted cane, which folded, like the bamboo sails of China in use at the present day; this again, gave way to one of hemp-thread joined with small twisted strips of oxen skin, and this in due time became developed into the "fine linen with broidered work," recorded in the prophet's lamentation—though for the accuracy of the descent we cannot vouch, information that stretches back to an era so remote, being necessarily more or less obscure and unreliable. In Homer's time linen was the common material borne by the Grecian vessels, though previous to his age it is probable that his countrymen put to sea under leathern sails, or sails formed of hides. The story of Hercules sailing with the back of a lion seems to corroborate this theory, he having possibly hung up his garment, which was a lion's skin, to aid the progress of his boat. The sails of British ships about the period of the Roman invasion were of tanned leather cut very thin, and so they are described in the pages of Cæsar; though the real progress of navigation by means of sails can scarcely be said to have an earlier date than the beginning of the

fourteenth century, an age that marks an epoch in the history of naval architecture and navigation.

The shapes of sails require but few words, having varied little even from the traces of their earliest forms. Ancient boats invariably carried a square sail with a yard above and below; gradually, this was more generally replaced by the triangular, which in modern Egyptian boats is of immense size, to catch the wind when the Nile is low. The Portuguese in the East Indies use circular sails, and Chinese junks in light weather carry a topsail of canvas or cotton, which they stretch to only about half the actual height that it may bulge and receive fuller wind pressure, since it has been ascertained that a *curved* surface holds more wind than a *flat* one of the same perpendicular height.

The age which has shewn to the world the gigantic power of steam, which has annihilated distance by means of electric communication, which has divided two continents and given a new passage to India, and cut a tunnel through the Alps, will in all probability, witness the last days of sail-supremacy, as it is witnessing the decay of the famous "wooden walls" which have for centuries so faithfully maintained England's renown, and it is not unlikely that the change from a sailing fleet to one of mere mechanical propulsion will be gradually effected in all the great navies of the world. One thing is certain, relative to the change, that a totally different system of training will be necessary to secure to our navy of the future, that prestige which belonged indisputably to the navy of the past, for vessels built on scientific principles will require the guidance of men who have been scientifically trained. In steam ships sails will be less essential than engines, sailors less required than engineers, for vessels fitted with engines cannot stand up under the same amount of canvas that was carried by, and necessary to, the older type of war ship, to which it was eminently a *sailor's* duty to attend, a duty for which he was qualified by the whole system of nautical training and naval warfare.

MAR TRAVERS.

[In the above paper, as will be perceived, no attempt has been made to treat the subject of sails in connection with their most recent application and development. The object has been merely to touch upon the associations which have come down with them from time immemorial, and this, we believe, will have an interest for many of our readers.—ED. *N.M.*]

TYPHOON AT JAPAN.

EXTRACT from a letter from an officer of H.M. ship *Barrosa*.*

"You will probably like to hear some account of a typhoon in which we were caught on a lee shore, and of our narrow escape (how narrow nobody knows), and as I know you take an interest in such phenomena I will endeavour to give you some idea of it, for it is a subject of great importance to every seaman, and only to be obtained by a careful comparison of observations made by intelligent men of the various phenomena attendant upon such storms, and of the ship's position not only with regard to latitude and longitude, but also with reference to the centre of the storm.

"The mail steamer *Ottawa* was in the same storm and bearing S.E. by E., about ninety miles from the *Barrosa* at noon on the 5th, she being then near the centre of the storm, as was evinced by the rapid shifting of the wind and the extremely low barometer (27·70). We were a long way from the centre but not by any means removed from the full force of the storm, so that it probably extended over a diameter of one hundred and fifty or two hundred miles.

"At noon on the 4th July we were near Chimney Rock, south of Udsi-sima, the centre of the storm then bearing about S.S.E. from us, probably about 300 miles, and advancing in a N.N.E. direction, and travelling, as was afterwards ascertained by comparing notes from the places it visited, at a considerable speed.

"The weather during the day was peculiar, the sky was trying, as it were, to clear (it had been very thick in the morning), but as fast as it cleared squalls kept coming up against the wind, or, the wind being northerly, from S.S.W., and passing away to the north eastward. No doubt there was an upper current of air driven at a long distance before the storm, which clashed with the then prevailing wind and fell in rain; this and similar phenomena attentively observed and recorded may enable the mariner to

* The account of this storm may seem imperfect for any practical results to be drawn from it, but we do not apologise to our readers for inserting it, as in these days of clamour for the higher education of the officers in the navy, it may serve as an exemplification that at least some young officers are observing as well as intelligent. The letter was accompanied by a lucid diagram, but for want of corresponding observations from the other ship, it will at once be seen that the vortex of the storm could not be satisfactorily traced, and thus it was not necessary to reproduce the diagram.—ED. *N.M.*

detect the approach of a cyclone, and a series of them would prove of great value.

"During the night the wind was pretty steady from E. by N. inclined to freshen a little, with a falling barometer, the rain squalls continuing to come up with great regularity until about 2.30 a.m., when the wind freshened rapidly to a gale ahead (easterly). At this time we were about ten miles eastward of Cape Chichakoff, the southern point of Kiusiu, and it was then probably that we first felt the influence of the circular storm, it being to the southward of us, and ourselves on the extreme verge of the circle. The wind was not steady but kept shifting about until ten a.m., when it suddenly went to the N.E. and stopped there, the barometer falling more rapidly than before.

"It was evident that we were now fairly in the storm, and in the north-west quarter of it, the centre bearing about S.E., consequently we were in no anxiety as to the vortex knowing that the storms in this latitude always travel in a north-easterly direction. In this position it was of course advisable to put the ship on the starboard tack so as to steer away from the storm, but this we were unable to do on account of the proximity of the land, Tagena Sima being under our lee, and which we deemed to be so close that the mere fact of wearing ship might just have made the difference as to going on shore or not, we were thus obliged to keep on the port tack which prevented us getting out of the storm as we should have done.

"At one p.m. the wind was N. by E. and at three it was N. by W., thus showing that the centre of the storm was passing away to the northward and eastward, the vortex at the times stated being E. by S. and E. by N. respectively. By four p.m. the wind was N.N.W. and shifting more rapidly, with a rising barometer, subsiding at about 4.45 at W.N.W., showing the centre of the storm to be then bearing N.E.

"On the 6th the storm caused the immense amount of damage at Kobe in the inland sea, of which you will have heard; the force of the wind together with the partial vacuum in the vortex causing the sea to rise above its proper level, piling steamers and junks in amongst the ruins of the houses.

"The *Ottawa* first felt the force of the storm at four a.m. on the 5th with the wind from S.E., she lost four boats and shipped some heavy seas. At one time, as I before remarked, she must have been very near the centre of the storm, as they observed the partial clearing which is said to take place in the centre, the sun being visible for some time."

YACHTING.

THANKS to Mr. Ashbury and the New York Club, the waning season is not likely to die out without a few faint flickers of excitement. Not that the world cares much for what are grandiloquently termed International matches. There was a time, perhaps, when the merest hint of an approaching contest between the champion skittle players, or the champion knurr and spell artists of this country and any other, would have roused one's feelings of nationality to fever heat. That time however, has gone by, never to return, we were about to add, but nobody knows. Our American cousins (and for the sake of adding to the breadth of the phrase, we may likewise say our Canadian cousins) have been our chief opponents in these international—but not altogether bloodless—contests. If the subject were not tabooed in decent society, a reference to the gallant struggle between Sayers and Heenan would come in here. But no: prize fighting is dead of inanition, sharp animadversions on that base Briton who cut the ropes at Farnborough have lost their sting. Then Mr. Ten Broeck crossed the Atlantic with a stud of horses for the express purpose of sweeping all before him. He won some races, history tells us—prizes worth the winning, but he did not sweep all before him. About three years since he returned to the land of his birth, and it was not requisite, strange as the statement may appear, to charter more than half a dozen "carrying" merchantmen of extensive tonnage, in order to convey the dollars he had won on the turf back to his native land. Possibly he converted the pecuniary results of his career on the English turf into greenbacks. By and bye, the rowing men tried their hands. It was given out that such a man as James Hammill (otherwise, and more familiarly, "Little Jimmy of Pittsburgh"), never did exist since sculling in outriggers came into fashion. Hammill, precious careful beforehand to provide against the sinister influences of Thames steamers, "came" to the Tyne, "saw" Kelly row away from him, and returned to Pittsburgh considerably "beaten." Prior to the Pittsburgh sculler's trip across the Atlantic, he laboured under the impression, that if a man could handle a pair of heavy dumb-bells as easily—and gracefully—as a Spanish damsel manipulates her castanettes, he was bound to beat the champion sculler of England. After the Newcastle races he lost a good deal of faith in dumb-bell theory. After Hammill we had Walter Brown, "a lesser light" in the

American sculling world (although he did not appear to think so), who was matched with a Thames "second-rater," but so unimportant was the contest considered, that to this day a waterman of either Tyne or Thames would have to overhaul his memory to furnish a tolerably correct account of the race. Mr. Ashbury is taking care that the international spirit shall not die out. He incurred the steady dislike of the Yankees (including of course that courteous person "Devoted Yachtsman") when he beat the *Dauntless*, in that memorable Atlantic race. They can never forgive that. Then he had the hardihood to challenge for the cup won by the *America* in 1851, and what was worse, to dictate conditions. How he wrote letters leagues long; how the New York Yacht Club replied; how "Devoted Yatchsman" tore his hair; and how, eventually, owing to Mr. Schuyler's old fashioned respect for fair-play, Mr. Ashbury got his way—is it not written in the sporting chronicles of the time? That Mr. Ashbury has plenty of pluck may be admitted. It is a pity he is so fond of after-dinner vapouring, otherwise one might almost make a hero of him—a sort of modern viking. He is now in America, sailing his "mistake," the *Livonia*, against the chosen of the New York Club for the much-coveted cup. The agreement come to, was that seven races should be sailed by the *Livonia* and the American yachts.

On Monday, the 16th, the first of the matches was sailed in smooth water, and with light winds. The *Columbia*, a fast new centre-board schooner, won the race; but the *Livonia* gained on her whenever the wind freshened. The race was over the New York Yacht Club course of forty miles, and the *Columbia* won by twenty-seven minutes, or about three miles. On Wednesday, in the second race, the *Livonia* was again beaten by the *Columbia* in a race of twenty miles to the windward of the Sandyhook Lightship and back. The race occupied three hours, and the yachts had a moderate breeze. The *Columbia* won by five minutes, or ten with time allowance. On Thursday, the *Livonia* won the third race, beating the *Columbia* by eleven minutes over the club course. Strong winds prevailed.

Referential to these meagre and doubtless somewhat misleading telegrams the "Times" published the following paragraph:—

"Mr. H. Liggins, of 3, Ladbroke-square, in the absence of his friend, Mr. Ashbury, who is now in his yacht *Livonia*, sailing the series of matches against the New York Yacht Club, desires to correct some statements made in New York on the subject of these races. In the 'Times' it was stated that 'Monday's race for the Queen's Cup was run in smooth water and light winds,' etc. Now,

Mr. Liggins thinks it is of interest to all classes that they should know that this contest is not for the purpose of regaining the Queen's Cup, which was won in 1851 at Cowes by the yacht *Bacchante*, but that the cup won by the *America* was the ordinary Royal Yacht Squadron Cup, valued at one hundred guineas, which has for many years been offered by them to 'all royal yacht clubs and the New York Yacht Club.' So little, says Mr. Liggins, have the Americans valued it that none of their yachts, when over here, since 1851, have considered it of sufficient importance to accept the challenge and try to possess it. The same liberal offer has for years past been made by the Royal Thames Yacht Club; but no persuasion could ever induce an American yacht to risk the chance of defeat. The telegram states that the winning vessel, the *Columbia*, 'is a new centre-board schooner, remarkably fast.' Mr. Liggins thinks 'many of our non-nautical readers may be glad to know that vessels of this form of build are not permitted to sail in matches in England, for this reason—that they in no way promote the improvement of naval architecture, and are termed mere 'racing machines.' No country but the United States continues their use, and here they are and always have been considered as pretty toys, not vessels, ever since their invention in this country in 1790, by Captain Shank, R.N."

So much for Mr. Ashbury, who may be dismissed until next month, when, with fuller accounts of the international matches before us, we shall be better able to weigh the respective merits of the competing vessels.

The third match of the Junior Thames Yacht Club was sailed on the 23rd of September, for a prize presented by Joseph Mabey, Esq., one of the members of the club. There were five entries but two only appeared at the start, the *Marguerite*, 6 tons, Mr. F. Brown, and the *Invicta*, 7 tons, Mr. G. Haines. A flying start was made and the *Marguerite* won a match that presented no features of interest.

A new iron screw steamer yacht, named the *Mona*, has been built for Lord Howe by Messrs. Day, Summers, and Co., of the Northam Ironworks, at Southampton, and tried at the measured mile in Stokes Bay with the following results: First run, 65 lb. steam, 89 revolutions, 5 min., equal to 12 knots per hour; second run, 65 lb. steam, 88 revolutions, 5 min. 14 sec. or 11·46 knots; the mean speed being 11·73 knots, or 13½ statute miles per hour. This rate of speed is the more satisfactory, as it has been proved that the *Mona* is able to keep it up at sea. She has steamed round the Isle of Wight, a distance of 60 miles, in 4 hours and 40 min., and

on her late cruises to the Channel Islands, Cherbourg, Dieppe, Plymouth, and other places, she made on an average between 11 and 12 knots per hour. The *Mona* is a very handsome yacht, with two masts, and is rigged as a fore and aft schooner; length between perpendiculars, 140 feet; beam, 20 feet; depth from base line to under side of deck, 13 ft. 9 in.; tonnage, builders' measurement, 272. She has a very spacious saloon, with a clear head room of 7 ft., and the sleeping cabins are provided with baths sunk in the floor, which are filled direct from the sea, and emptied into the bilge. The yacht is fitted with Day, Summers, and Co's., compound engines of 60-horse power, nominal; diameter of high pressure cylinder, 20 in.; low pressure ditto, 40 in., with a 2ft. stroke. The steam is expanded about eight times, and the results are extremely favourable in economy of fuel. The *Mona* is found to steam 250 miles per twenty-four hours, with a consumption of four tons of coals. The application of the compound engine to yachts will effect a complete revolution in the yachting world. Hitherto the great drawback to the use of steam power in a yacht was the large quantity of coal consumed by the old class of engine, and consequently the frequent necessity of putting into port for fresh supplies of fuel, with its attendant inconveniences. But the improvements carried out in the *Mona's* engines will enable a yacht of her size to carry sufficient coal for a voyage to New York, steaming all the way.

Mr. J. C. Wilcocks, contributes to the *Field* some highly seasonable, and we think, useful suggestions as to the best mode of laying up a yacht. He says:—"There is a great difference of opinion as to which is the preferable course to adopt in laying up yachts, particularly small vessels. Large vessels are ordinarily laid up in the saltwater mud of some spacious harbour or creek; but if it is desired to leave them accessible at all times of tide, they are moored in a deep harbour, like Dartmouth, or placed in the most retired portion of a floating dock. A vessel, if coppered, will do very well afloat; but if not, should have a coating of some reliable composition to protect the bottom from worms and shell fish. It is best to take the ballast out of a vessel as often as every other year, in order that the mud which inevitably accumulates should be removed. Having then been thoroughly cleansed, the framework and planking should be well-coated with a mixture of two-thirds Stockholm to one-third of coal tar, and if boiled together it will dry and harden the sooner. Coal tar alone ought not to be used, as a very pungent odour exhales from it, which many persons cannot endure. The smell of Stockholm tar is, on the contrary,

rather pleasant, and is known to be wholesome. The proportion of two-thirds Stockholm to one of coal tar will quite overcome any unpleasant odour from the latter, whilst the latter will cause the mixture to set harder than if all Stockholm were used. If any troublesome insects should have found admission on board, procure a gallon or two of gas water, and squirt it with a powerful syringe into such holes or corners as cannot be reached by washing in an ordinary manner. This will destroy everything objectionable in the shape of insect life. The ballast should be thoroughly washed and broomed, after which it should be well lime-washed before being restowed on board. Close to the stem and sternposts there are angular cavities, which collect dirt, in every vessel, and which from their limited space are difficult to be, and consequently are not often cleaned. It is a good plan to put plenty of tar into these places, and then fill them with a mixture of Portland cement, gravel, and sand, to the level of the timbers and dead wood. These angular spaces once filled up, no dirt can find admission. Not a few yachts have no lining to their coal-holes; the consequence is, that any water which may find its way into the bottom of the vessel cannot flow back into the pnmp, but remains in front of the the coals, becomes putrid, and when the vessel is at all lively in a sea it exhales a bad odour. A notch is cut in the under side of the floor timbers of every vessel, before her skeleton is placed *in situ*, to allow any water to escape aft; but, if there be no lining over the keel, this channel as a matter of necessity must be choked by the coals or coke. This can easily be prevented by a single lining board, which should be accurately fitted above the keel about three inches, by chamfering the edges of the board away until it fits the garboard strake or lowest plank. A small chain has been recommended to be kept stretched through the 'limbers,' as the notches in the under sides of the timbers are termed; this, by being drawn to and fro, will clear away any obstruction if it arises. The difference of draught in salt and fresh water in the case of a 14-ton yacht will probably not amount to more than two or three inches."

New Docks for Brindisi.—We learn that it has been proposed to the Minister of Public Works to construct some new docks at Brindisi. This is what has long been desired by merchants trading with the port, and others interested in its welfare, and will help very much to develop the harbour and increase its usefulness.

LIFE SAVING HAMMOCKS.

To the Editor of the Nautical Magazine—

DEAR EDITOR:—In alluding to the very interesting paper* by Admiral Ryder regarding the utility of the naval hammock, as a means for saving life in the now too common event of the sudden loss of a ship by collision, capsizing, or blowing up by torpedoes, I propose to make use of some of Admiral Ryder's facts and arguments, and offer such suggestions of my own, as may lead to a thorough ventilation of the subject.

I have long persisted that men-of-war should be furnished with life-boats, and every convenient and practicable form of life preserver; there is no valid reason that fighting men who ship to be killed and drowned, should not be furnished at the cost of the government they serve with means for rescuing them from sudden death when such accidents occur as we have lately witnessed, in the cases of the *Captain;* the *Amazon;* a Russian frigate, sunk at midday, by accidentally ramming another vessel; a British man-of-war, the *Bombay*, lost off the English Bank, Rio de la Plata; our own Steamer *Oneida*, on the coast of Japan, and many others, fresh in the memory of my readers. The paper alluded to relates principally to the value of the hammock as a safe, handy, and cheap life preserver, I shall therefore confine my suggestions mostly to this article of furniture.

Commander Bridge, of the *Caledonia*, at Malta, September, 1870, reports to Admiral Ryder the result of experiments, thus:—"A well lashed hammock containing only a bed and blanket, supported for a few minutes seven naked men; for a considerable time four men, and would I believe have continued to do so for nearly an hour. The officers who witnessed the experiment were, with myself, astonished at the floating power of the hammock. The hammock was a new one, and consequently less pervious to water than an old one would have been."

Captain Wilmshurst, of the *Valiant*, made further experiments, by order of Admiral Ryder. He estimates the buoyant properties of a hammock, thus:—

"Weight of water displaced by a well lashed hammock	138·24 lbs.
Weight of same with bed and blanket, when dry ..	24·5
Buoyancy of dry hammock	113·74

* Published in our September number.—ED. *N.M.*

"Length, 55½ inches; Diameter, rolled up, 9¼ inches; Volume, 2·16 cubic feet.

"A weight of six pounds attached to one end of this hammock sank it in five minutes. If the same weight were attached to the middle it would float much longer: or, by actual experiment, nine minutes.

"By simply oiling the bed-ticking the hammock floated two and a half hours, and would, no doubt, have supported a man for that time."

Captain Wilmshurst says that the horsehair bed supplied to the seamen of the Royal Navy is *charged to them at* 10*s.* 6*d.*, that beds stuffed with *cork shavings* can be supplied by wholesale at 5*s.*, and with cocoanut fibre, 7*s.* 6*d.*, the latter would be less buoyant but more comfortable. He states that a bed 6 feet long, 4 feet wide, and 4 inches thick, stuffed with cork shavings, weighs 20 lbs. This will support 80 lbs. of dead weight. A mattress stuffed with cork shavings costs in England less than half the cost of hair.

In conclusion the Admiral writes: "I have been told by an officer of rank, who was on board the *Bombay* when she was burned off Monte Video, that if it had occurred to them to stand by hammocks, before the men jumped overboard, all hands might have been saved. Many of the men were drowned while the overladen boats near by could contain no more; the boom (or stowed boat,) could not be got out, because the falls were burned, and there was not time to make a raft, as all hands were employed in attempts to subdue the fire until they were ordered to leave the ship."

Without stopping to comment on this large loss of life, from a first-class man-of-war, in smooth water, let us discuss, carefully, the value of the hammock.

The British hammock, with horsehair bed and pillow will sustain a man who has his wits about him "*a considerable time*,"—long enough to save him if there be vessels near by. This bed costs Jack ten shillings.

A hammock with mattress of cork shavings, 6 feet by 4 and 4 inches thick, would sustain two or three men indefinitely, *at half the cost.*

Nothing but red tape, after this, ought to prevent a sale of all the hair beds in the Navy, and substituting cork shavings. But it may be said, and said truly, that the comfort and health of the men constantly is of more importance than saving a few when rare accidents occur, therefore, stick to hair.—And hammocks stowed in

the nettings, (if such things have not become obsolete, since iron-clads came into fashion,) filled with hair beds and blankets, keep out grape and musket balls, therefore, stick to hair.

Perhaps cork shavings may answer this purpose even better than hair. For my part I cannot see that the health of the men could be impaired by sleeping on cork shavings, *in a hammock*. A thin cork bed put *on deck* would be hard, and perhaps impair health in the long run. I would inquire why hair mattresses cannot be entirely dispensed with in men-of-war for the men?

Conceding that hammock nettings, grape-shot, and musket balls are out of date, and that iron-clads may carry all their hammocks in lockers on deck, ready for capsizing and sinking gracefully in the day time, or suddenly at night; I would suggest that instead of a common hammock and hair bed costing poor Jack altogether a pound sterling, at the least, the Government should supply, as part of the outfit, an *air hammock* for every man, or a common hammock, supplied with a mattress of vulcanized ticking 5 feet by 3, and 3 inches thick when inflated; to be divided in the middle, so as to have a pliable joint, and two valves, and leave a hole in the centre large enough to admit a man's head; this would give ample support to a man or two, and when put on like a poncho would serve to protect the body from blows by coming in contact with wreck stuff, or the shore.

Such a hammock, necessarily inflated when in use, would be ready for any emergency, and would be very healthy and comfortable, and when rolled up, lashed, and stowed away, a very small portion of the air left in it, would leave it still very compact and amply sufficient in buoyancy to float a man, who, if worth saving, would easily unpack his hammock in the water, inflate it and take his ease.

Of course all this is supposing the weather to be suitable, or not cold enough to chill a man through in a short time; this is a contingency difficult to guard against by any floating power where the body is to be exposed to cold. Of course there will be plenty of men to argue, that any floating power dependent on air chambers and valves is not to be trusted,—that badly made rubber goods become soft and sticky in hot weather, especially in monitors and iron-clads, or cold and stiff in cold weather. There is something in this—not much. I have to-day in use an India-rubber bag, into which I have blown air between the tick lining and the outside for near twenty years, in hot and in cold climates; it is still serviceable, and cost originally about five

dollars. I can trust it to-day to pack a week's clothes in, and by its buoyancy in that condition I can cross a river—dress dry on the other side.

Why then cannot air "Poncho Mattresses" be supplied to the Navies of the whole world at a cost of five or six dollars. It must be remembered that a machine of this kind used every day by men dependent on it for safety would be very durable, it would have constant care, and careful inspection.

Something cheaper still may be devised in the shape of an air pillow, to be kept in the hammock and never allowed to collapse entirely: this would sustain a man easily, and as to mattress, I hold that a good blanket under, and another to cover, is all a seaman wants in his hammock to be healthy and comfortable.

All I ask is that the mattress and pillow, whether of hair, cork shavings, cork dust, or air reservoir shall be well made, and furnished by the country, and its condition well inspected, occasionally the hammocks should be piped up and every man made to go overboard, unpack and inflate them; in this way a raft could be made capable of transporting stores and all hands.

R. B. FORBES.

P.S. Since the above was written I have become satisfied that the Poncho mattress will be too expensive except for Admirals and Commodores, and it is questionable whether they ought to be saved. The flap hammock and the air pillow can be furnished cheap and will be sufficiently buoyant.

R. B. F.

Boston, October 4th, 1871.

We are very pleased to observe that this important matter is attracting attention on the other side of the Atlantic, and we gladly publish Captain Forbes' letter with the object, as he says, of thoroughly ventilating the subject. Admiral Ryder in a letter to a daily contemporary, has recently stated that, "The mattresses now under trial, at my suggestion, on board Her Majesty's ships are stuffed with granulated cork, and are ribbed. I can vouch for their being comfortable, having slept on one for several nights. I look forward with hope to their being adopted throughout the naval services of all countries."

THE LOSS OF THE *MEGÆRA*.

If the circumstances attending the disaster of H.M.S. *Megæra*, as described in the following official despatches, reveal a most serious and lamentable culpability on the part of some person or persons to whom it has yet to be brought home, it must at the same time be confessed that they shew up the conduct of the captain, officers, and crew in a very admirable light. We are not disposed to go into ecstacies over the behaviour of those concerned, for after all it was only what should be expected of Englishmen; but we cannot help feeling to some extent re-assured at the coolness and judgment displayed in this emergency, and that the fearful mistake of sending out the rotten ship was not supplemented by any further negligence or ignorance. It is needless now to discuss the question as to the vessel's unfitness, that is sufficiently clear; it only remains now for the Admiralty to make a searching investigation into the matter, and to fix the blame somewhere.

The story of the landing and settling down of the five hundred human beings on the uninhabited island, brings with it remembrances of Robinson Crusoe, and certainly the particulars are most interesting, especially when we know that no real danger now exists, so far as regards the safety of the officers and crew.

Reporting Her Majesty's Ship Megæra at St. Paul's Island.

"H.M.S. *Megæra*, at St. Paul's Island, June 17th.

"Sir,—At midnight on the 8th instant, in lat. 39° 40′ S., long. 44° 22′ E., the chief engineer having reported to me that the ship leaked considerably, I manned the pumps by employing part of the watch, who contrived to get the water under. On the 12th the water from the leak gained, and then I employed men in addition to bale her out, and used the donkey pumps. On the 13th it was reported that the leak was caused by the loss of a rivet in the ship's botton, under port bunker, nearly abreast of the mainmast (which was afterwards found to be incorrect, as a plate was discovered to have been considerably worn away, and the edges of the hole so thin that they could be easily bent with two fingers). We continued using the hand-pumps and donkey engines, at the same time baling out, until the 15th, when, finding the water gaining on us so considerably, I was obliged to get up steam to enable me to use the bilge pumps, at the same time shaping my course for the

island of St. Paul's to enable me to send the divers below (we fortunately having demanded, before leaving England, a diving apparatus), and examine the state of the ship's bottom.

"If by putting a plate on from the outside with a spindle, and lined with 'fearnought' supplied for that purpose, and another plate inside screwed to the outside one, the poop awning thrummed, doubled, and placed over that part of the ship, then carefully frapped round with ropes to keep it in its place, I trust that the ship may be made sufficiently seaworthy to continue our voyage to some part of Australia; should, however, our ship not have arrived soon after you receive this letter, we have found the ship too bad to proceed, and are waiting at St. Paul's for a ship to convey us on.

"In making this report, I have taken the opinion of the officers whom I ordered to survey the ship, and give me their opinions as to the ship being sufficiently seaworthy to proceed on our voyage.

"I have to add that on the 14th a plate lined with India-rubber was put on from the inside being gently pressed, but would not stop the leak.

"On the night of the 16th, being about twenty miles from St. Paul's, rounded the ship to until daylight, it was blowing a very heavy gale, the ship being under fore staysail, gaff foresail, with head not set, and the same with storm main trysail, using steam to keep the ship free of water. The ship behaved beautifully, riding quite easily, notwithstanding the very heavy sea running. After an anxious night, just at daylight the clouds lifted for a short time, and we made out the island of St. Paul's about nine miles nearly astern, ran in under steam with four boilers, at nine a.m., anchored with S.B. anchor in 14 fathoms, veered to 3½ shackles. 11.40, the ship dragging, weighed, and found the crown and both flukes of anchor gone; steamed in again, anchored with B.B. in 12½ fathoms, veered to 5 shackles, sent the diver down to examine the ship's bottom, sent a boat away to sound and ascertain if the ship was anchored on a sandy bottom or rock. Mr. Lloyd, navigating lieutenant, reported the bottom to be black sand; steaming during the continued heavy squalls to ease the cable.

"In the afternoon the diver discovered the leak; but it was too late to put a plate on that evening, housed topgallant masts, kept yards pointed to the wind, men working continually at the pumps. I ordered the two chief engineers, Mr. Mills, of the *Megæra*, and Mr. Brown, of the *Blanche*, also Mr. Richards, engineer of the *Rosario*, to send me in reports as to the capabilities of the ship (copies of which I enclose). They reported that, even in the event of the present leak being thoroughly stopped, the plate is so honeycombed

from corrosion—which they attribute to age and wear,—that they consider it most unsafe to proceed on the present voyage unless a thorough examination of the ship's bottom could take place, removing the cement, and putting new plates on, which, under the present circumstances, is utter impossible. Notwithstanding this report, I still anticipated being able to proceed when the leak was stopped. Sunday, June 11th.—At daylight the ship dragged again; weighed, and found cable had parted close to the anchor. 8.30 a.m.—Anchored again with port sheet anchor in 13 fathoms; veered to 5 shackles; it was not possible to veer more cable as the wind shifted so suddenly in squalls that the ship would have grounded with more cable; neither would it have been safe to let go two anchors with the chance of drifting, and not having time to weigh both.

"The diver reported the ship's bottom was generally clean, but there were several rusty spots; the leak he discovered by placing his hand over each until he felt the suction of the leak through the hole. He could not say whether the other rusty spots were nearly leaks or not, but the corners of two overlapping plates were eaten away near the bad plate to the extent of 4in. by 1½ in. He could easily have picked through the rusty iron left with his knife, but thought it would not be right to do so. Besides these rusty spots, damaged corner-plates, and the leak itself, the diver reported five or six plates, from the keel upwards, looked very rusty under the stokehole. Between eight and nine a.m. on that Sunday, the 18th of June, Messrs. Mills and Brown reported again to me that, upon a further examination when the ship was pumped out drier, we found many of the girders eaten through at the bottom, and others nearly so, one of those quite through ran across the plate through which the leak had taken place.

"The bilge pumps were constantly being choked, and on the doors of the valve boxes being taken off to clean them, also the lid of the non-return valve, pieces of iron were taken out about a quarter of an inch thick and an inch and a half in diameter, evidently having been washed from the bottom, for some of them had remains of cement on them. On receiving this second report, and also that of the diver, I came to the conclusion that, evidently breaking up as the ship was, the girders separating from the bottom, that bottom leaky in one place and very thin in many more, the pumps continually being choked with pieces of iron and those thick pieces—that in the face of those reports from men who knew the nature and endurance of iron better than myself or any other officer of the ship, I could not longer persist in proceeding on our voyage with so

many lives at stake, we being 1,800 miles from the nearest part of Australia; so at 9.15 a.m. I turned the hands up, read prayers, and then informed the ship's company that the ship was not fit to proceed on her voyage, and ordered provisions and stores to be at once landed.

"At about noon the diver succeeded in putting a plate on, and nearly stopped the leak. I then got a Frenchman living here to pick out a nearer berth for the ship to the shore, where the whalers generally anchor, and the anchor might not get foul of the rocks; we shifted into 8½ fathoms, sandy bottom, with good shelter from the Ninepin Rock.

"We landed most of our provisions the first day, and employed the men at night filling coal bags ready to be landed in the morning. We also kept men at work clearing the store-rooms and troop-decks, and everything we could from the lower part of the ship, keeping the pumps going at the same time. Monday, June 19th.—Steaming up to anchor, very heavy squalls, ship's quarter close to rocks. 7.30.—Dragging, weighed anchor, found one fluke gone, remained then under weigh, steaming in and landing boats with coals, wind increasing, no use anchoring, signalled to boats inside to remain, hoisted up those alongside; twice the ship's head paid off in shore, though steaming with four boilers, and we were only just saved by steaming full speed astern. 1.30 p.m.—Blowing very heavily in squalls, ship only just able with four boilers to remain near the land; deemed it advisable to beach, the ship having only one anchor left, three having parted since anchoring at 9 a.m. on the 17th, and the impossibility of the remaining one holding, or of our steaming all right, clear, and close to the land. 1.40.—Steamed for the bar. 1.52.—Took the ground, 10ft. forward, 13ft. gangway, 18ft. under the stern.

"Marks.—Points, S., 20° E.; gap, N., 5° W., ship's head west about 30 zoros from inside of bar; ship bumped heavily at first; water soon rose in the holds; let go remaining sheet anchor from the bows to prevent the ship slipping off shore, and steamed full speed ahead to keep the ship in position, until the water rose, and extinguished the fires; ship settled down and remained perfectly stationary and upright; a shore was put over to keep the ship upright, but snapped immediately; a raft had been constructed to land stores upon, but with the assistance of four boats belonging to the island we did not use it. Hoisted out three tanks to use as boilers for condensing; charts reported no water on the island. 10 p.m.—Up boats, bar being unsafe in the dark at low water. Midnight, water in fore compartment 7½ feet, engine room 12½ feet,

aft 14 feet. At daylight on Tuesday, the 20th June, lowered boats and went on landing stores all day; during the night we had been hoisting all we could above the water. Many casks of lime, paint, oil, are under water, some shell and powder. The sails were all saved and most of the slops and bales; some are wet and damaged. I hope to get up many things yet by using the diver. Though wine and beer stores of all sorts were landed together, I have not heard of anything being missing or any drunkenness, the officers and men both working willingly. Some officers were filling coal bags, working under the main deck, where we had opened it to get out coal for condensing.

"There are several sheds and houses on shore that, with tents, have enabled us to get many stores under cover. Two shore boats were manned, loaded, and discharged by some of the officers entirely.

"We have about 13,000 lbs. of bread and about six weeks' flour. So the men are on one-third allowance of these provisions, or, using one bag per diem, they will last 130 days. We have found 3,000 lbs. of rice on the island besides. Of rum and other provisions we have more than four months'. Any quantity of fish. Cray fish can be caught, and water, our chief difficulty, has been found in abundance. Twenty men can fetch for every one in two hours. This is rain water, but it rains frequently during the next four months.

"June 24. The draught of water, 12ft. 9in. forward, 15ft. engine-room, 17ft. 8in. aft. Punished Jethro Spear, ordinary second class (second class for conduct) with forty-eight lashes for refusing to work. This is the only case of insubordination that has occurred.

"The condensing arrangements are now complete. Three hundred gallons with coal, 150 gallons with turf can be made daily; but as long as a supply can be obtained from the wells by means of hoses, we do not intend to use any coals; the turf cut and dried we find answers for fuel, using a little wood as well.

"This afternoon all the men, with their bags and hammocks, are under tents and well protected from the weather, though about 40 men and 13 officers are still living on board. As soon as sufficient tents and houses are erected all will be landed. They are quite able at present to live on board, but the smell of bilge water is increasing. I therefore propose in a few days to land every one.

"Sunday, June 25. Read prayers on board. The wind very light I consider to be the cause of heavy rollers coming in, there being no lee side to the island unless a strong westerly wind is blowing. The First Lieutenant read prayers on shore. During the afternoon

the weather was better for landing. No work was carried on, the day being Sunday.

"Monday, 26th. Sent a party of 100 men to finish hoisting up a studding sail boom for a flag-staff; signalmen and a party of marines, to carry water from the water-pools to the starting hose at the top of the cliff, 860ft. above the ship, are quartered there under canvas, with turf sides to their tents.

"We have completed the length of hose the whole distance, 860ft., to the camp this day, and the water runs down freely in about ten minutes, being a great saving of sending men all the way to the top with barricoes.

"It is estimated that there are about a hundred wild goats on the island, a large quantity of mushrooms, some few cabbages and potatoes. There are hot fresh water springs, strongly impregnated with sulphur, and not healthy to drink, but very well suited for washing, with a clay close to it that lathers well and makes excellent soap. This spring is within a quarter of a mile of the encampment.

"There are only five men at present on the sick list, with sores and wounds. The climate, as far as we can judge at present, is very healthy; great care has been taken that any men getting wet are shifted immediately.

"One red light has been seen at night, and two ships passed the island on Friday, the 23rd inst. We fired guns and sent a boat out, but they passed too far off to recall them. A "sea message" has been prepared, and we trust to send it adrift shortly, as well as using two life buoys for the same purpose.

"June 29th. Commenced building large barracks; abandoned ship; all hands encamped on shore.—I have, etc.,

"ARTHUR THRUPP, Captain.

"P.S. July 9th, 1871.—Encamped at St. Paul's. The divers have been at work ever since the 27th of June; they could not get into the magazine, but have recovered from the forepart of the ship a great quantity of the cargo. In one day they got up three coils of rope, four wooden casks, twelve bales, two rolls of lead, two tubes, fourteen casks of oil, eleven casks of tar. This was the most recovered in any one day. Some of the wet bales contained hammocks, others canvas, flags, stockings, serge, and duck; these are all being opened, dried, and sewn up in canvas. Nearly all the marine clothing packed in casks could not be got at before the ship grounded; they are nearly all wet, and not fit for issue. Cases of mess traps have been opened, oiled, and repacked, more or less damaged. The new sails for the *Clio*, *Blanche*, and *Rosario*, I had hoped to save from being used at all; but the weather is so cold,

the *Megæra's* sails so thin and worn, the men getting wet at night, that I reluctantly gave permission for these new sails to be used to cover stores and tents, with orders not to cut any of them; but I am afraid they will get very much damaged from exposure to the weather. It is a question of health or saving of sails; I think the former most important. Every bit of canvas, except new in bolts, has been used to shelter men and officers. Probably they will be here for many months. The thermometer is below 48° at night, and the weather wet and stormy. A leading stoker got wet in his tent last night, and is suffering accutely from rheumatism; others have had diarrhœa, and some slight attacks of dysentery among the officers; but there are only eight on the sick list at present, owing to the great care of the medical men, attending, inspecting, and seeing tents are kept clean and dry.

"On Thursday, the 6th of July, a large old building, containing stores and candles, was blown down by the violence of the wind. The men inside escaped without injury, crawling out from among ruins; it was built of loose stones.

"The same day I had to recall the working party from the ship because the bar was so bad. Many of the roads have been re-paved, and pieces of ground levelled ready for building. One or two small houses of stone erected, as well as those for the officers. Parties of men and officers are fishing in boats, and fish caught are served out by the ship's steward, 1 lb. to each man as far as they will go. From 100 lbs. to 150 lbs. are caught by this means every day. Still, having been here now three weeks, and not having been able to send word of our want of provisions, I have thought it advisable to reduce the allowance of provisions. The men have now only 4 oz. of biscuit, ½ lb. of salt or preserved meat, half an allowance of tea every other day, quarter allowance only of sugar. Limejuice without sugar is served out every other day. No flour issued at all; but, having plenty of cocoa, they have that instead of their tea every other night.

"The men's clothes suffer very much from the hard work they have had, carrying water barricoes, digging, cutting turf, rolling casks, working in mud over their boots or shoes. I have ordered canvas leggings to be made to save their trousers. The boats require constant repair; one cutter, a very old boat, is so damaged that she cannot be repaired. A great number of bottles, weighted with lead, with a tin flag above the cork, containing an account of our position, have been thrown overboard from our lifeboat some miles out to sea, as well as one life-buoy and a barricoe; more bottles are ready, and will be sent from time to time.

"I have ordered Acting-Lieutenant Lewis T. Jones to hold himself ready to leave at a minute's notice, should any chance occur from sighting a vessel. I have ordered Assistant-Paymaster Cummins, who is sick, also Navigating Sub-Lieutenants Roxby and Hazlewood, both for surveying duties in Australia, to be ready as well, and will send Mr. Farie, midshipman, a ship's corporal, and thirty supernumerary boys, if any vessel will take them.

"A second tank has been strengthened to use as a boiler, another sunk below high-water mark for condensing, and an additional quantity of piping laid down by the engineers. Their men are also employed in cutting, drying, and stacking turf.

"The blacksmiths are constantly employed repairing spades; nearly all we had have been broken. Our work is much delayed by the few picks and spades we have.

"Parties have been sent out to collect different grasses, with herbs, dandelions, and other substitutes for ordinary vegetables that can be found, to prevent the men from suffering from scurvy, as there is very little limejuice left. They have succeeded in cooking some tolerable vegetables. The weather has been very cold indeed—below 42°, with snow lying on the ground at the signal station; continual hail in squalls for nearly a week, accompanied by wild, stormy weather. During the bad weather very few fish have been caught.

"ARTHUR T. THRUPP, Captain.

"The Secretary to the Admiralty."

(Enclosure No. 1.)

"Her Majesty's ship *Megæra*,

"St. Paul's Island, June 17th, 1871.

"Sir,—In answer to your memorandum of the 17th instant, calling upon me to state my opinion of the capability of the ship, I respectfully beg to state that, after a careful examination of the leak through the plate and of the plate itself (as far as I could see and reach), I am of opinion that, even in the event of the present leak being temporarily stopped, the plate is so honeycombed from corrosion, which I attribute to age and wear, I consider it most unsafe to proceed on the present voyage unless a thorough examination of her bottom could take place, which, under the present circumstances, is utterly impossible.—I have, etc.,

"GEORGE MILLS, Chief Engineer.

"To Captain Thrupp."

(Enclosure No. 2.)

"Her Majesty's ship *Megæra*,

"Island of St. Paul's, June 17th, 1871.

"Sir,—In compliance with your memorandum of this day's date, calling upon me for my opinion as to the capabilities of the ship, I beg to state I have carefully examined the plate in which the leak has broken out, and find it is gradual decay of the iron, and that the plate for some distance round the hole is much corroded, and large rust holes found in the plates, and the place where the leak is broken through is not more than 1-16th of an inch thick. This fact I ascertained by placing my finger through the holes (from the inside), and taking the state of the plate and the age of the ship (upwards of 22 years) into consideration, in my opinion, as an engineer, the ship is absolutely unsafe to continue her voyage to Australia without being placed in dry dock in order to remove the coating of cement on the bottom so as thoroughly to examine it.—I have, etc.,

"Ed. Brown, Chief Engineer."

(Enclosure No. 3.)

"Her Majesty's ship *Megæra*,

"Isle of St. Paul's, June 17th, 1871.

"Sir,—In compliance with your memorandum of this day, calling upon me for my opinion as to the seaworthiness of this ship, I beg to state that, considering the age of the ship, and that one of her bottom plates has given way and caused a leak that scarcely the pumps could keep under, in all probability other plates are in as bad a condition, and therefore we might expect other casualties, I consider her unsafe to proceed on the voyage.—I am, Sir,

"J. E. Richards, Engineer.

"To Captain A. T. Thrupp,

"Her Majesty's ship *Megæra*."

(Sub-Enclosure of Nos. 1 and 2.)

"Her Majesty's Ship *Megæra*, June 18th, 1871.

"Sir—We, upon a further examination when the ship was pumped out drier, found that many of the girders were eaten through at the bottom, and others nearly so: one of those eaten quite through ran across the plate through which the leak had taken place.

"The bilge pumps were constantly being choked, and on the doors of the valve-boxes being taken off to clear them, also the lids of the non-return valves, pieces of iron were taken out a

quarter of an inch thick and an inch and a half in diameter, evidently having been washed from the bottom, for some of them had remains of cement on them.—We are, etc.,

"GEORGE MILLS,
"EDWARD BROWN, } Chief Engineers.

"To Captain T. Thrupp, Her Majesty's ship *Megæra*."

In addition to letter dated 19th of June, 1871.

"Her Majesty's ship *Megæra*, aground at
"St. Paul's Island, July 18th, 1871.

"Sir—I have the honour to inform you that on Sunday the 16th of July, in the afternoon, a vessel was reported in sight. Seeing our flag hoisted upside down on the hill as a signal of distress she shortened sail, and came close in under the land; the life-boat with Acting-Lieutenant Lewis T. Jones, got alongside of her with a few Admiralty returns and a remittance list. She proved to be the *Aurora*, a Dutch ship, from Amsterdam, bound for Batavia, in ballast, with a small general cargo. In a few minutes the life-boat came back, leaving Mr. Jones on board, sending a message that she could take twenty men, and would do anything I wished. She then filled, with the intention of getting closer to the shore; it was getting late, and she never came back, though her lights were reported in sight at four S.W. next morning, which could not have been correct, for at daylight, two hours afterwards, though fine and clear (the Island of Amsterdam, fifty miles off, in sight), nothing was seen of her.

"I very much regret that so good an opportunity of sending my despatches was lost; on all other occasions, when sighting a vessel, they have been sent out in the life-boat. Unfortunately, on this occasion, I was on the opposite side of the island, examining to find a new path up the crater, that we might more easily communicate with the south side of the island. On returning, I was going out in the life-boat to make arrangements with the Dutch captain, when the vessel made sail. We expected her all the next day, but she never came back.

"Knowing that water would be the chief difficulty, we have had prepared a number of casks that are filled with condensed water and water from the hills. By these means we could send on board any vessel three tons a day, and in a few days get sufficient to take a large number of our men to Australia.

"But in case of any ship being sent to take the men and stores, the vessel should have steam power at her command, especially at

this stormy season of the year, as the anchorage is unsafe, owing to the heavy squalls and rocky bottom.

"As soon as Lieutenant Jones reaches Batavia he has orders to communicate with the senior officer at Singapore, as well as to telegraph to England and Australia if possible.

"I have ordered a duplicate of all these letters to be forwarded direct to England, so that no time may be lost in acquainting their lordships of our present position. I have done this in case the ship should not be proceeding direct to Sydney or Australia at all.—I am, etc.,

"ARTHUR T. THRUPP, Captain.

"To the Secretary to the Admiralty."

AN OPEN POLAR SEA.

ON the 10th April, 1865, a paper was read before the Royal Geographical Society by the Secretary, Mr. Clements Markham, on "The best route for North Polar Exploration," but on the 27th February previously, a letter had been read from Dr. Petermann, strongly advocating an exploration to the North Pole by the route called the Spitzbergen route, that by the open sea between Spitzbergen and Nova Zembla, and at that meeting Captain Sherard Osborn strongly advocated the route by way of Smith Sound. At the reading of Mr. Markham's paper, the subject was fully discussed and the advocates of the two routes gave their opinions and their reasons for them.

The open Polar Sea of *Kane* remains still to be confirmed, and even if confirmed, its extent would be extremely problematical. As to the existence of a Polynia or open sea immediately around the pole, it is simply visionary, and the assertion of the discovery of an open Polar Sea, simply from the fact of a vessel having found open water in the 79th degree of latitude is, we think, rather premature; but it is not detrimental to the efforts of the gallant men who ventured so far north in an unprotected vessel to say so.

Dr. Petermann has communicated to us the fact that Lieutenant Payer, a former assistant of Captain Koldeway's, with Lieutenant Weyprecht, had arrived at Tromsö, having, in a hired Norwegian ship, attained a latitude of 79° North on the meridian of 43° East, with favourable conditions of ice northward. It is also stated that there was open water between the meridians of 42° and 60° East.

The telegram from which this information was derived gave no particulars, and we have yet to learn the details of this bold attempt. At present, we can only say that the attempt confirms the argument of the advocates of the Spitzbergen route, that were a ship boldly to take the pack that travels south, and persevere to pass through it, an open sea would be found, but how far that open sea would extend towards the pole is of course unknown.

We can scarcely complain that Lieutenants Payer and Weyprecht did not take advantage of the open sea and prosecute their voyage towards the pole, but it seems a pity with such advantages, which may not occur again for many years, that the voyage north was not persevered in.

This reported open sea is moreover said to "swarm with whales," and we may hope that the adventurous men who navigate the Peterhead ships will not be long before they penetrate into this region, and bring us some further particulars. We trust also that England will send her representatives to endeavour to solve the question as to this open sea. The subject is of the highest importance, and should not be lightly disregarded by a nation which has hitherto furnished the most daring and successful Arctic explorers.

NOTICES OF BOOKS.

The Bahamas—A Sketch. By Surgeon Major Bacot: London, Longmans. 1869.

We have seldom read a more interesting and pleasant little book than this of Dr. Bacot's. Too often the narratives of travellers and sojourners who relate their experiences of foreign climes are tedious and dry, being filled with a quantity of unimportant details which have little interest for the reader in search of instruction or entertainment. But we do not think this can be said of the work before us. The author seems to have a comprehensive mind, and having determined upon his subject he has dealt with it in a masterly manner. He modestly entitles it a sketch, but his sketch is very much more filled up with agreeable lights and shadows than many a more pretentious work.

The Bahama or Lucaya Islands present many very interesting features. Their extent is considerable and the absence of any detailed survey of them gives an additional value to any descriptive particulars concerning them. A very large proportion of the group

are nothing more than mere rocks and cays, amongst which the navigation is intricate and dangerous. The principal island is New Providence, lying in lat. 25° 29′ N., and long. 76° 34′ W., and Dr. Bacot tells us it "extends twenty-one miles from east to west, and measures seven in breadth from north to south. The harbour is formed by a long, low islet, which stretches some three miles along the face of the northern shore, leaving a strip of water from half a mile to three-quarters of a mile in breadth, with an opening at each end, which admits of the entrance of vessels with a light draught of water. In the olden time the enormous advantage of being able to sail out at one end, while a Government cruiser entered at the other, made the harbour of New Providence a very favourite spot with captains of all vessels objecting to the right of search, and probably determined the choice of its shore for the site of the capital, Nassau."

The description of the appearance of the town of Nassau is given in a very lively style. In a chapter headed "The Aborigines," the author tells briefly the tale of the discovery of the islands by Columbus, and the gradual expulsion of the original inhabitants by the Spaniards. The story of the sufferings of the simple and tender-hearted Lucayans does not give a favourable impression of the Spaniards in the days of Columbus. For some time the islands seem to have been the resort of pirates, who carried on fearful depredations and lived in a most brutal manner. The following description of one of these ruffians will no doubt be interesting to our readers.

"Blackbeard, as the one particular villain, who made his name a household word at New Providence, deserves a more particular notice. The real name of this desperado was either Edward or John Teach, he is said to be a Welshman by birth, and he gathered under his black flag a desperate gang of ruffians, styling himself their commodore, and assuming the authority of a legitimate chief. In look and manner he was well calculated to rule over the lawless wretches who followed him. His countenance, always ferocious, was rendered still more frightful by his enormous beard, which he wore twisted and plaited into tails. Reckless and passionate at all times, his appearance in action, mad with excitement, must have been diabolical. In private life his acquaintance must have been most undesirable. He is said to have owned fourteen wives, whom he ill-used shamefully; his conduct towards one, indeed, being so inhuman, that drunkenness and insanity combined, could hardly account for it. In his lighter hours, when grimly facetious, he amused himself at the expense of his most favoured companions.

On one occasion he determined to convince his followers, that so far as it was possible to imitate hell upon earth, he was most qualified to play the ruling devil. He collected, therefore, a quantity of sulphur and combustible material in the ship's hold, and fastening the hatches down on himself and the crew, lit the bonfire, and involved himself with them, literally in fire and brimstone. With oaths and frantic gestures, he acted the part of the devil, as little affected apparently by the smoke, as though he had been born in the infernal regions, until his companions, nearly suffocated and fainting, compelled him to release them." But the ruffian at last met with a richly deserved fate. "He was lurking in a small sloop of light draught of water among the creeks and shallows of an inlet near Cape Hatteras, in North Carolina, when Lieutenant Maynard, in command of two hired sloops, manned from the *Pearl* and *Lime* frigates, surprised him. Blackbeard determined to die hard—he posted a trusty follower with a lighted match over the powder magazine, to blow up the vessel if he should be overpowered. This plan, however, was upset by his own violence. Believing Maynard's decks to have been cleared by the fire, Blackbeard, followed by twelve of his men, boarded and rushed upon the lieutenant, whose crew, hitherto concealed, hastened to meet the pirates. A desperate fight ensued; and Blackbeard, after receiving repeated wounds, fainted with loss of blood while cocking a pistol, and died upon the spot. Many of his followers perished with him, and the prisoners expiated their crimes upon the gallows.

"What became of Blackbeard's treasure was never known. An affectionate friend, fearful perhaps that he might die with a weight of treasure upon his mind, asked him if any of his wives knew anything about it? but Blackbeard said, nobody knew but he and the devil, and the longest lived of the two might take all. The devil is supposed to have a good share of it still."

Eventually however the islands appear to have become more respectable, and sundry colonists settled there. They brought with them the civilizing influences of Christianity, trade was encouraged, slavery was abolished, and during the American war the blockade runners finding special advantages in the quiet harbour of Nassau, gave an immense impetus to the commercial activity of New Providence.

As to the climate of these islands, Dr. Bacot tells us that "there is no doubt, whatever, that the climate is during the winter months simply delightful; the rain-fall is then very moderate, and the porous soil so rapidly absorbs the surface water, that there is scarcely a day on which the new comer cannot take his walk or

drive, or enjoy a sail upon the quiet waters of the harbour, with a summer breeze to fan, and a blue sky to smile on him, and yet he is but four days distant by steamer from New York, where at this very time, the snow is falling, the day is dark and gloomy, and the only air to be breathed, is the stove-heated atmosphere, within the fast closed doors." Although he says further on, speaking of New Providence, that "during the summer months the climate is by no means agreeable, and at times it has been very unhealthy, particularly in parts of the island, and perhaps even in parts of the town, when compared with others. The interior of the island is marsh and swamp, the dry ground being covered with pine trees. Most of the marshes lie to the southward and south-westward of the town; the city, however, is shut in and sheltered from the south and south-west winds, which blow across the marshes, by a ridge of high ground, which slopes downwards to the water's edge, leaving free exposure to the northern and north-eastern breezes."

He also gives some useful particulars taken from Governor Rawson's reports as to the winds, etc., prevalent at the Bahamas. "The highest winds usually prevail in November and January, and the average from October to March, inclusive, considerably exceeds the average of the remaining six months. North-easterly and easterly winds are most prevalent from September to February, during which months they blow during one-half or two-thirds of the whole time. Northerly winds seldom blow except during those months, and then only for three days in a month. In June to August the average is less than a day. Easterly and south-easterly winds prevail chiefly from March to August. South-westers are most prevalent in February and March, to the extent of two to three days in a month; westerly winds from February to April, to the extent only of one to one-and-a-half days in a month, and during the rest of the year of less than a day monthly; from November to March, about two days in a month. The relative frequency throughout the year is shown in the following statement of the percentage proportion of days in a year during which they prevailed at nine a.m.

North	7·2	per cent.
North-east	26·2	,,
East	24·4	,,
South-east	18·6	,,
South	11·0	,,
South-west	5·0	,,
West	2·3	,,
North-west	5·3	,,
	100·0	,,

"The density of clouds does not vary much throughout the year, but is rather greater from May to October than during the other six months. In the autumn, fogs in the mornings and evenings are common."

The concluding chapter on the census is full of interesting details concerning the inhabitants past and present. There are some sad revelations of the evil practice of wrecking which is carried on by certain of the dwellers in these islands who look to the sea to supply many of their wants.

"A very large trade passes through or near the Bahamas. The winds are strong, and the currents are dangerous, and accidents will happen, even to the most careful. There is many a quiet spot, too, offering what the poor ignorant enthusiast is said to have prayed for, the blessed virtues of solitude and temptation; and scandal has it, that many a wreck which takes place at the Bahamas, has been arranged at the port of departure of the gallant vessel. It is only to be expected, that with such chance of prizes, many should take shares in so gambling a transaction of wrecking. A day's luck may prevent all necessity for further labour for a year; and a lucky season enrich a man for life. Not only the seamen and the fishermen, but the agriculturists keep boats, and are ready to play their parts, in the oft-repeated melo-drama, 'The Wreck Ashore.'"

It is to be hoped that the establishment of a more efficient police will check this frightful evil; it is satisfactory to observe that among certain people on the islands "it has been considered an evil means of getting money," and is therefore now almost given up.

We cannot part from this book without expressing our appreciation of the very pleasant and intelligent manner in which the author has performed the work he set himself. He evidently has a warm interest in the associations of the islands, and we venture to think his good impressions of these little known parts of the world, are due in no small measure to his own personal geniality which shews itself throughout his book. We heartily wish all travellers would make their recitals as agreeably instructive as Dr. Bacot has made his Sketch of the Bahamas.

We have to acknowledge the receipt of the *Quarterly Weather Report* from the Meteorological Office; the first number of the *Jahrbucher fur die Deutsche Armee und Marine*, and the *Geographie und Enforschung der Polar Regionem*, Nos. 48 and 50, from Dr. Petermann's Geogr. Mittheilungen.

MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
74	Oregon—Yaquina Bay.	Establishment of a Light.
	California—Pigeon Point.	Establishment of Fog Signal.
75	Sumatra—West Coast—Benkoelen.	Establishment of Harbour Lights.
76	Mediterranean—Sicily—Trapani.	New Light on Extremity of Mole.
	" " France—Port Frioul	Alteration in Light.
77	England—East Coast—Cromer to Lowestoft.	Alteration in Buoyage, etc.
78	Baltic—Sweden—Ystad Harbour.	Eastern Mole Light Discontinued.
	" Gulf of Bothnia—Geffle Bay—Skutkärs.	Exhibition of a Light.
	North Sea—Norway—West Coast—Fæö Island.	Establishment of a Light.
	" Netherlands—Texel—Schulpe Gat.	Establishment of Lights near entrance.
79	England—West Coast—Liverpool Bay.	Alteration in Buoyage, etc.
80	England—South Coast—Downs.	Alteration in position of N.W. Goodwin Buoy.
81	West Indies—Jamaica—Port Morant.	Establishment of Buoys.
82	United States—Maine—Little River Lighthouse.	Establishment of a Fog Signal.
	" " Manheigan Island.	Establishment of a Fog Signal.
	" " Penobscot Bay.	Establishment of a Bell Boat Buoy.
	Nova Scotia—Sambro Island.	Discontinuance of Fog Trumpet.
	" Cranberry Island.	Alteration in Fog Signal.

NAUTICAL NOTICES.

(All Bearings are Magnetic.)

74. *Oregon—Yaquina Bay.*—A *fixed white* light of the fifth order, elevated 160 feet above the sea, has been established on the north front of the entrance, in lat. 44° 36½′ N., long. 124° 4′ W.

California—Pigeon Point.—A steam fog whistle, which in thick and foggy weather will sound in blasts of *four seconds* duration, at alternate intervals of *seven seconds* and *forty-five seconds*, has been established on this point in lat. 37° 11′ N., long. 122° 22½′ W.

75. *Sumatra—Benkoelen.*—Two harbour lights of the sixth order have been established—

1. A *fixed white* light on Poeloe Tikoes, elevated 39 feet, should be seen 8 miles.

2. A *fixed red* light on Point Tapu Padrie, visible between the bearings South to E. by N., elevated 59 feet; should be seen 3 miles.

76. *Mediterranean — Sicily — Trapani.*—An ordinary *red* light which should be seen 4 miles, is exhibited from the extremity of the mole, on the quarantine building.

Mediterranean—France—Port Frioul.—A *fixed red* light will on the 15th November, replace the white light at the extremity of the mole. The new light is elevated 35 feet, and should be seen 5 miles.

77. *England—East Coast—Cromer to Lowestoft.*—The following alteration in the buoyage and the position of the light-vessels have been made, viz.:—

COVEHITHE CHANNEL.—*S.W. Barnard.*—A new *can* buoy, *chequered black and white* has been placed on the east side of this channel in 13 feet water with the following marks and bearings. Lowestoft Mill, its width westward of Kirkley High Mill, N.N.E. ¼ E. Covehithe church in line with the north end of Covehithe Cliff, W. by N. Covehithe Buoy, N.N.E. ¼ E., distant half a mile.

STANFORD CHANNEL. — *East Middle Newcombe* and *N.E. Newcombe* Buoys are altered to *conical* buoys.

CORTON GATWAY.—*Middle Corton Spit* Buoy has been moved S.W. a quarter of a cable.

South Corton Spit Buoy has been moved S.S.E. ½ E. 2¼ cables.

South Corton Buoy has been discontinued.

North Holm Buoy has been moved S.W. by S. 2 cables, so as to mark the end of the Spit.

HEWETT'S CHANNEL.—*Corton Light-Vessel* has been moved E.N.E. half a mile.

St. Nicholas Light-Vessel has been moved W.N.W. one cable. In order to give a more distinguishing character to the lights exhibited by this vessel, the low fixed red light will, on or about the 15th November, be changed to a *quick flashing* light.

S.E. Corton buoy has been moved N. by E. half a mile.

N.E. Corton buoy has been moved north 3 cables.

SCROBY SAND.—*South Scroby* buoy has been moved N.W. by N. 4 cables.

South Scroby Spit buoy has been moved N. ½ W. 4 cables.

S.W. Scroby buoy has been moved S. ¼ W. 4 cables.

Scroby Fork buoy has been discontinued.

CROSS SAND.—*S.W. Cross Sand.*—A new *conical black* buoy has been placed to the southward of the sand in 8 fathoms with the following marks and bearings. The northernmost black mill at Yarmouth, its full length northward of the Britannia Pierhead N.W. by N. Corton mill

just on with the south end of a wood W.S.W. N.E. Corton buoy S.W. ¾ W. 1½ mile.

South Cross Sand buoy has been moved N.E. ½ N. half a mile.

HAISBORO' SAND.—*S. W. Haisboro'* buoy.—A new *can* buoy *chequered black and white*, has been placed on the south-west side of the sand in 11 fathoms with the following marks and bearings. Haisboro' low light-house twice its length open southward of East Runton mill W. ½ N. Waxham Church tower its length northward of Hickling Church, W. by S. ¼ S. South Haisboro' buoy, S.E. by E. 1 1/10 mile.

East Haisboro'.—A new monster *conical black* buoy *with staff and globe* has been placed on the east side of the sand in 15 fathoms, with the following marks and bearings. South Repps Church in line with a mill northward of Maudsley W. by N. Bacton Church tower twice its width southward of Edinthorpe Church W. ¼ S. Hickling and Palling Churches in line S.W. ¾ W.

78.—BALTIC.—*Sweden-Ystad.*—The green light on the eastern mole is discontinued.

Gulf of Bothnia.—Gefle Bay.—Skutkärs Harbour.—A *fixed red* light visible 4 miles, established on the N.W. extremity of Malu Island in lat 60° 39′ N., long. 17° 25′ E.

North Sea.—Norway—Fæö.—A *fixed white* light of the fifth order, has been established on Fæö Island in lat. 59° 23′ N., long. 5° 11′ E.

North Sea,—Netherlands,—Texel.—Schulpe Gat.—Two lights will shortly be exhibited in the immediate neighbourhood of the two beacons on Zanddijk, near the entrance of Schulpe Gat. The outer buoy of the Gat will be in the line of the two lights.

79.—ENGLAND.—*Liverpool Bay.*—The following alterations have been made in the buoyage and in the position of the light-vessels in Liverpool Bay.

Queen Channel.—In consequence of the north-westward extension of Little Burbo bank, and of the Spit of Jordan flats, the guides to the navigation of this channel will be re-arranged, so that the Formby and Crosby light-vessels brought in one shall mark the mid-channel fairway course over the bar, corresponding changes being made in the buoyage, as follows:—

Formby Light-Vessel will be moved W.N.W. 320 fathoms.

Queen Channel Fairway bell beacon will be moved N. by E. ¼ E. half a mile.

Q 1 *Black Nun* buoy will be moved N.E. ¾ E. 3 cables.

Q 2 *Black Nun* buoy will be moved N.W. by W. ⅓ W. 90 fathoms.

Q 2 *Red Can* buoy with staff and ball. An additional buoy will be placed on the south side of the bar marking the point of the N.W. Spit of Little Burbo bank, in 9 feet at low water, with the following marks and bearings:—

Q 1 Red Can buoy ..	N.W. by W. ¾ W. 3 cables.
Formby light-vessel and Crosby lighthouse in one	S.E. by E. ¾ E., distant from the former 1⅕ mile.
Q 3 Red Can buoy ..	S.E. ¼ E. three-quarters of a mile.

Q 3 *Red Can* buoy will be placed 200 fathoms S. by E. ¾ E. from the present position of Q 2.

Q 4 *Red Can* buoy will occupy the station now numbered as Q 3, the staff and ball being removed.

Q 3 *Black Nun* buoy will be moved W. by N. ¾ N. 150 fathoms, lying on the margin of the Spit of Jordan Flats in 18 feet at low water.

CROSBY CHANNEL.—In consequence of the extension into the channel of the N.E. Elbow of Great Burbo bank, the buoy C 3 red can, with staff and ball, will be removed north (nearly) 125 fathoms, and the red can buoys C 1 and C 2 will be shifted to form a line from Q 4 to C 3 red can buoys; the red can buoys C 4, 5, and 6 being also shifted to maintain the line of bearing as at present from the new position of C 3 red can, with staff and ball, to Rock lighthouse. Also the buoys C 1, 2, 3, Black Nun, will be shifted to the margin of Taylor's bank, dividing in equal spaces the distance from Q 3 Black Nun to C 3 black Nun.

VICTORIA CHANNEL.—In consequence of the closing up of this channel the whole of its buoyage will be removed, except the Fairway buoy, which will be designated "Victoria," the name to be painted thereon in white letters, and will retain its position and other characteristics as at present. The north-west light-vessel bearing from it W. by N. ¼ N., 3⅖ miles. Queen Channel Fairway bell beacon, N. ¾ E., 1½ mile.

FORMBY CHANNEL AND ZEBRA FLATS.—F 3 *Red Can* buoy, with staff and ball, will be moved N.E. by E. ⅛ E., 2 cables.

Zebra Buoy will be shifted N. ¾ E. a quarter of a mile, to form a line as at present with the Queen Channel Fairway bell beacon, and the Formby buoy, F. N.W. buoy, bearing from them N.E. by E., ¾ E., and S.W. by W. ¾ W., nearly 1½ mile from each.

Directions.—Queen Channel.—Under the new arrangements the bearing of the bell buoy from the north-west light-vessel being E. by N., allowance must be made in the course according to whether flood or ebb-tide be making.

The Formby and Crosby light-vessels in line will lead over the bar in 9 feet at low water spring tides, midway between the buoys Q 1 red can and Q 1 black nun. Hitherto the duty of the inward-bound vessels to meet the outward with port helm has placed them in some difficulty when navigating between the Formby light-vessel and the bar, from uncertainty as to when they could afford to alter course so as to bring the Formby light-vessel on their port bow. By the new position of the buoy Q 3 red can to the southward of the former position of Q 2, some additional space is gained, and the new position of Q 2 red can, with staff and ball, on the N.W. spit of Little Burbo, will indicate the point whence advantage may

be taken of this gain by altering course to pass to the southward of Formby light-vessel. To sailing vessels working down, this part of the Channel remains the most difficult point, and in case of missing stays near the buoy Q 3 black nun, great care must be used to prevent fouling the Formby light-vessel.

Crosby Channel.—The change in buoyage does not make any perceptible change in the courses to be steered in this channel. The depth of water on the lump marked by the buoys C 4, 5, and 6 red can at its shoalest part is now only 9 feet instead of 10 feet as formerly; this spot lies S.W. about 100 fathoms off the buoy C 5 red can, and the new arrangement of these buoys leads on the slope of the shoal in 11 or 12 feet instead of on its shoalest part as formerly.

80. *England—South Coast—Downs—Goodwin N.W. Buoy.*—Has been moved W.S.W. 4 cables, and now lies in 13 fathoms at low water spring tides.

81. *West Indies—Jamaica—Port Morant.*—Five buoys have been moved at this port, viz.:—Two buoys at the entrance,—

East Buoy, red with *staff and cross vane*, in 4½ fathoms, with the following bearings; Pero Point, N. ½ E. (Easterly), 7 cables; Leith Hall Pier, N.N.W. ½ W.

West Buoy, red and white stripes with *staff and cross pieces*, in 4¾ fathoms, with the following marks and bearings: Middle of Red Cliff on with the centre house on the hill N. ¼ E., Battery N.W. by W. ½ W., nearly half a mile.

Three buoys in the harbour—

Harbour Shoal Buoy, lead colour, on the N.E. edge of the harbour shoal in 2¾ fathoms; Leith Hall pier bearing N.W. nearly 7 cables.

Cotton Tree Spit Buoy, white, on the western edge of the Cotton Tree bank in 3 fathoms, from it Pero Point bears S. by E., 3½ cables.

Leith Hall Shoal Buoy, lead colour, on the extreme of Leith Hall shoal, from it Leith Hall pier bears W. by N. ⅜ N., 4¼ cables.

82. *United States—Maine—Little River Lighthouse.*—A fog bell, struck by machinery, has been established, and in thick or foggy weather will receive *two blows every minute.*

United States—Maine—Manheigan Island Lighthouse.—A steam fog whistle has replaced the fog trumpet hitherto used. In thick or foggy weather the whistle will give *two blasts every minute*, with an interval of *eight seconds* between each blast.

United States—Maine—Penobscot Bay.—An iron bell boat has been moored in 10 fathoms, half a cable S.W. of the point of the shoal of South Breaker.

Nova Scotia—Sambro Island.—The fog trumpet hitherto used has been discontinued. In thick or foggy weather the signal guns of a ship or the

sound of a steamer's whistle, will be answered by *two* guns fired in quick succession.

Nova Scotia—Cape Canso—Cranberry Island.—A steam fog whistle has been substituted for the fog trumpet hitherto used. In thick or foggy weather the whistle will be sounded *eight seconds* in *each minute*, with an interval of *fifty-two seconds* between each blast.

New Lights.—Norway.

The following copy of a translation of a Notice to Mariners, received from her Majesty's Consul-General at Christiania, has been received by the Board of Trade:—

[Translation.]

NOTICE TO MARINERS.

On Tuesday, October 17th, the following new lights will appear:

(1.) Smorhavn, fast light of the fifth order, S.W. point of Fiskholmen, lights from N.W. $\frac{3}{4}$ W., through W., S. and E. to E. by N., shows a red light from the first mentioned compass point to N.W. by W. $\frac{1}{2}$ W., otherwise white. This light shows the sailing course to Troisoen as well as to the entrance of Smorhavn and Kalvaag. In order to make Smorhavn, Fiskholm must be kept on starboard side, after which steer N.E. along the Island of Rota until the narrow entrance to the harbour is passed through, when anchorage is found in six to eight fathoms water. To make Kalvaag, keep to the northward until the angle of the right light is seen, then starboard the helm, and bring the light right astern. By keeping within the angle of the red light, the Holmes and shoals lying on both sides are cleared, and anchorage is found after passing Flathholmen. Variation is allowed for the above-mentioned points of the compass. The light will burn annually from the 1st of August to the following 15th of May; lat. 61° 45′ 45″ N., long. 4° 56′ 3″ E.; height above the sea, 91 feet (100 English). Light seen at a distance of $2\frac{1}{2}$ to 3 miles (10 to 12 English).

(2.) Bjornsund, a fast white light of the fifth order, on the eastern part of Mooen Light, from W. by S. through W., N. and E. till S.E. by S. $\frac{3}{4}$ S. by compass. The light is a guide to the entrance from Hustadvigen to Leden, to the east and west of the Bjornsund Islands, and into Bjornsund Harbour. The harbour is not a good one, and is difficult to make without the assistance of a pilot or local knowledge. Pilots can be had at the Bjornsund Islands. At Harrosund, one mile (four English) S.E. by E. of the light, there is a good harbour. This light burns annually from August 1st to May 15th following; lat. 62° 53′ 52″ N., long. 6° 49′ 26″ E.; height

above the sea 86 feet (93 English). Light can be seen at a distance of two and a half to three miles (10 to 12 English).

The following alterations in the existing lights will be made after October 17th:—

(1.) Sandvig point Light (at the entrance leading to Arendal), which hitherto has shown a white light all through, will show a red light to the east of a line drawn from about one and a half cable's length west of Kaken Shoal. This line (comp. var. south) falls clear west of Mardo Point and about one and a half cables length east of Little Thoningen clear water will be found by keeping within the boundary line of the red and white lights. As soon as Little Thoningen is passed, keep well in the white light before making for the light.

(2.) Skongshas, which hitherto has shown a fast light seawards, will, in the channel between Kraakefluen and Milfluen, show a revolving light with a flash and an eclipse alternately of two or three seconds' duration. Otherwise it shows a fast light as formerly. In foggy and thick weather a signal is given every five minutes with a bell, nine strokes with an interval of one second.

Navigation of the Humber.

The Trinity House, Hull, give notice that the Skitter Sand, between buoys Nos. 8 and 9, has recently laid up to the north-eastward, extending itself towards the main channel of the Humber: and the Sand now dries in places which, until lately, were covered with from ten to twelve feet water at low water of ordinary spring tides.

In navigating in this locality care should be taken to use the lead, and not to approach too near the Sand. Paull Clough Lights being kept in one will lead vessels clear of the shoal in a depth of not less than 30 feet.

HYDROGRAPHIC.

Magellan Strait.—Smyth Channel.

The following information relative to sunken rocks in Goods Bay and Molyneux Sound has been received from Commander Herbert P. Knevitt, of H.M.S. *Fawn*, 1871.

Goods Bay.—A reef, 1¼ cables in length, extends N.W. ½ N., from the northern point of the largest of three islands lying off the eastern point of entrance of Goods bay; it dries at low water springs, and has 5 fathoms just outside, with 4, 7, and 3 towards the point.

The reef at certain times of the tide is well marked with kelp, but this marking must not always be depended upon, as at the time of the *Fawn's* striking the kelp was not visible.

Molyneux Sound.—A rock with 9 feet water on which the *Fawn* struck, lies W.N.W., distant about 1½ miles from the northern point of entrance to Molyneux Sound, the south entrance point bearing S.E. by S. The rock is about 50 feet long south-east and north-west, and is steep to, having 2¼ to 28 fathoms within a cable on its northern side, and from 2½ to 20 fathoms at about 50 yards from its southern side; in a north-west direction from the rock, for a distance of 3 cables, the bottom is level with 20 and 21 fathoms.

The rock is marked by kelp, but the prevailing strong current prevents the weed from showing itself until it is twenty yards distant from the position of the danger.

During the twelve hours the *Fawn* remained at Molyneux Sound, both ebb and flood set over the rock to the north-west, running from two to three hours before low water, with a velocity of 2½ knots.

Strait of Jubal.

The following information relative to the position of a sunken rock in the anchorage bay on the south-west side of Shadwan island, is from the survey now in progress by Captain G. S. Nares, R.N., of H.M. Surveying-vessel *Shearwater*, 1871.

The small sunken rock, described in page 113 of the Sailing Directions for the Red Sea, to be nearly in the middle of the bay, recommended as an excellent anchorage during north-west winds, on the south-west side of Shadwan island; is situated much nearer the shore and the anchorage limits than is shewn by the detached danger on chart No. 2838.

It lies about 5½ cables from the shore, with the extreme of the low sandy point forming the western side of bay bearing N.W. by W. ¾ W., distant 8½ cables, and is thus nearly in the middle of the anchorage bay.

This rock can be seen with a proper look-out, having only 2 or 3 feet on it, or nearly awash. Five fathoms were found inshore of the rock, and 6 and 7 fathoms on its southern side.

GENERAL.

THE LATE SIR RODERICK MURCHISON.—We have to record the death of this most distinguished man of science, a man who has transmitted his name to posterity as one of the great benefactors to mankind. Human knowledge is all the richer for his existence, and though his body may not be amongst us, yet the results of his life will never die. As is pretty generally known, his great *forte* was geology. This study he pursued with remarkable energy and perseverance, travelling about here, there, and everywhere to verify, by constant experiments, his inductive researches. It is hardly within the province of the *Nautical Magazine* to discuss the details of Sir Roderick's geological investigations, we can only express our high appreciation of his devoted labours in that branch of science. As a geographer, however, we have more sympathy with his work. His geological knowledge enabled him to predict the discovery of gold in Australia, and the probable formation of the table land of Central Africa (which subsequent explorations have verified).

His energy and zeal as President of the Royal Geographical Society, of which he was one of the founders, are probably well known to most of our readers: he, himself, contributed numerous valuable papers to the Society, and in the Presidential chair he listened with close attention to the numerous papers which were read before him, and generally had some intelligent and pointed observations to offer upon each. His merits have been recognised by most of the learned Societies of the Continent, and his name is given to mountains and rivers in various parts of the world. All these honours he had earned by real work, and untiring energy. He was the friend of Livingstone, and each Monday evening at the Geographical Society, the public eagerly looked for intelligence from him concerning the lost explorer. In his private life he was loved and esteemed by all who knew him, he was kind hearted and enthusiastic, and gained many dear friends by his hearty self-devotion to good causes.

His fame is spread abroad; his name is honoured and revered in Great Britain;—and he has left the world at the ripe age of seventy-eight covered with honours, and, we doubt not, with a satisfied conscience that his life had not been altogether wasted.

ROYAL NATIONAL LIFE-BOAT INSTITUTION.—A Meeting of this

Institution was held at its house, John Street, Adelphi, on Thursday, 5th October. Rewards, amounting to £201, were voted to the crews of various life-boats for services rendered during recent storms. The Rye life-boat had gone off twice to the stranded brigantine *Cyrus*, of that port, and had happily been the means on the second occasion, under circumstances of great peril, of saving the crew of nine men, who, when the life-boat approached them, were enabled to drop into it one by one from the bowsprit of the vessel, the seas being so heavy that the boat dared not go right alongside. The *Licensed Victualler* life-boat, at Hunstanton, Norfolk, had been instrumental in saving the crew of four persons from the schooner *Major*, of Lynn, which had gone ashore at Holme. The Cullercoats life-boat, *Palmerston*, had proceeded to the assistance of three fishing cobles, which were unable to cross the bar owing to the very heavy sea running at the time. Nerved, however, by the presence of the life-boat, the fishermen were enabled to reach the shore in their boats in safety. The Caistor (Norfolk) large life-boat went to the help of the schooner *Angora*, of Bangor, which was in a very leaky state, and, after freeing her from water, she and her crew were, with the aid of a steamer, taken into Lowestoft harbour. While on their way with this vessel, another small one, the sloop *Trafalgar*, of Cley, was seen to have distress signals flying. Promptly the life-boat proceeded to her, and found she was in the greatest peril; but she also was got into Lowestoft. The crew of two men of this vessel, which is a very old craft, were very thankful to the crew of the life-boat for the ready assistance thus rendered to them. The Peterhead life-boat went off to the fishing boat *George and Ann*, of Cairnbulg, and found the boat in a perilous situation, and the crew in a most exhausted state. Encouraged, however, by the thought that the life-boat was at hand to assist them in the event of anything happening, sail was made, and the fishermen got safe to land. A few days later the schooner *Courier*, of Lerwick, showed signals of distress, and a large pilot boat failing to effect a communication with her, on account of the heavy sea, the Peterhead life-boat went out and placed some men on board the vessel, which was then brought into harbour with the loss of part of her sails. The Skegness life-boat did good service in saving seven men from the brig *Regina*, of London, and seven men from the brig *Orb*, of Whitby, besides taking the last-named vessel into Boston Deeps. The Donna Nook life-boat gallantly saved the master, mate, and four of the crew, from the rigging of the wrecked Italian barque *Three Sisters*; but the pilot and eight others of the crew of the

vessel had unhappily perished from cold and exposure, they having been some hours in the rigging during the night, and nothing being known of the wreck until daybreak. The Whitby life-boat, *Robert Whitworth*, succeeded on a recent occasion in bringing to shore the crew of three men belonging to the schooner *Dispatch*, of that port. Altogether it is gratifying to know that during the past twenty-one months the National Life-boat Institution has been instrumental by its life-boats and other means, in saving 1224 lives from different wrecks, besides aiding to rescue forty vessels from destruction.

The silver medal of the institution, and a copy of the vote inscribed on vellum, were granted to Miss Jane Campbell, of Drogheda, Ireland, in acknowledgment of her brave conduct during a strong easterly gale, in wading into a heavy surf and saving one of the crew of the brig *Manly*, of Whitehaven, which had been wrecked near Drogheda Bar. The poor man was in a very exhausted state when rescued, as he had been a long time in the water, and had floated some distance with the aid of a life-buoy, and he would inevitably have perished had it not been for the noble conduct of Miss Campbell in rushing at great peril to his rescue, and then using proper means to restore him to consciousness. The thanks of the institution inscribed on vellum were also presented to Mrs. Fox, of Kells, near Drogheda, in testimony of her most valuable services in aiding and encouraging Miss Campbell to accomplish her mission of mercy. The institution decided to station an additional life-boat near Drogheda on the south side of the mouth of the Boyne.

Payments amounting to £3500 were ordered to be made on various life-boat establishments. A. H. Coates, Esq., of Belfast, had, in conjunction with other friends, recently collected £48 17s. 6d. in annual subscriptions in aid of the funds of the institution; and £28 15s. 5d. had just been raised for it in the shipping offices at the Minories, and in Bristol, under the auspices of Captains Watson and Brooks. Sundry other liberal contributions were announced, as was also the establishment of a new life-boat at North Berwick.

A Universal Telegraphic System.—The globe will shortly be encircled with a telegraphic belt. We learn from the *Shipping and Mercantile Gazette*, that the missing link in the chain is about to be supplied by Mr. Cyrus Field, who has projected a line from Victoria, the Capital of Vancouver's Island, to Hakodadi in Japan, and from thence to the Russian Naval Station on the coast of Asia, whence

across the Steppes of Siberia it will penetrate to St. Petersburg, and there be connected with the great European system. This new line, the estimated length of which is 4370 nautical miles, will touch at Atcha, one of the Aleutian Islands. Two other routes are proposed, one starting from San Francisco, touching at Honolulu in the Sandwich Islands, and Yokohama in Japan, joining the main land at Shanghae.

We may confidently look forward to the still further development and application of the telegraphic system. Already it has made very rapid and astonishing strides since the electric fluid was first brought under control, and who knows but that as knowledge advances and teaches us how to bring the subtle spirit still more within our power, the telegraphic system may in the distant future successfully rival the present cumbrous mode of conveying the thoughts and sentiments of mankind all over the world.

THE CONTAGIOUS DISEASES ACT.—We are very glad to see that the Commission which has recently concluded its labours, have not yielded to the absurd clamours of those who would have this Act repealed on the ground of a misplaced and unpractical sentimentality. It is impossible to over-rate the usefulness of the provisions of this Act in our seaport and garrison towns. A number of self-satisfied moralists, who in their comfortable homes are quite out of the reach of the temptations which beset the sailor and the soldier, have set themselves to preach and weep over the sin of fornication, and to shrink with virtuous indignation against any legislation which, while recognising the existence of the evil, seeks to render its effects less dangerous to society. We have nothing to say about their preaching, but we have very strong objections to their establishing an organised opposition to such legislation. The question is one of political economy. Disease amongst our soldiers and sailors, means impaired efficiency and greater expense to the country, and the Executive is bound to take such steps as will prevent or mitigate these evils. Moreover, the evidence given before the Commissioners shews unmistakeably that the operation of the Act has already produced a very great decrease of prostitution in our seaport towns, and that, in our opinion, is quite sufficient to justify the legislative action already taken. We earnestly hope that the Act will continue in operation and be still further extended. The result will be, as far as our army and navies are concerned, that we shall have stronger and healthier soldiers and sailors, and a less expense and trouble in keeping our services efficient and reliable in time of need.

A Discovery in Navigation.—While nearly half-a-dozen different expeditions are competing with each other for the honour of discovering the North-West Passage, an important discovery of another kind has been made in the Arctic Ocean. It has been found that the Kara Sea, which lies between Nova Zembla and the north of Siberia, is (contrary to the belief hitherto prevailing) perfectly navigable. Some Norwegian vessels have made their way thither without serious difficulty, though they had to round Nova Zembla, and to sail as high as the seventy-fifth parallel of north latitude. This discovery has greatly stimulated the long existing desire to explore the great Siberian rivers Obe and Yenisei, which have hitherto been deemed inaccessible, by reason of the fact that they discharged their streams into the frozen waters of the Kara Sea. The Russian government has already taken the matter in hand, and is organising exploring expeditions, at the same time inviting the assistance of the commercial world. A wealthy proprietor in Siberia has offered to build, at his own expense, a vessel for the exploration of the Obe, on which river the Siberian capital, Tobolsk, is situated. If these rivers should prove navigable throughout, it is expected that the trade of western Siberia will be greatly developed. Tobolsk is the city through which the Chinese caravans pass, and to which are brought all the Siberian furs intended for Russia.

The Nausismograph.—Amongst the articles exhibited in Naples at the last Maritime International Exhibition was the Nausismograph of Signor Ferdinand Exposito Faraone, Engineer of the Royal Italian Navy. The name itself, given by the inventor to his apparatus, indicates that it is destined to replace the log of vessels, that is to say, to write at given intervals all details relating to the course, the speed, the winds, the sea, the working of the engine; in fact to register all those informations which are used as records in judging of the exactitude and necessity of the manœuvres executed. The Nausismograph for steamers is essentially constructed in two distinct parts, which can be placed in any relative position the one to the other, and the only condition required by the instrument is that of being placed in the longitudinal plane, and in a place where it can receive movement from the engine; it is composed principally of a compass which records the course; of a suspended regulator moved by centrifugal power, which registers the velocity of the engine; and of two pendulums noting the rolling and the pitching of the vessel. All these indications are given automatically, by the different parts of the apparatus, upon slips of

paper moved by clock-work, and are denoted by curves and diagrams. This apparatus placed in the captain's cabin tells the captain at every moment, if the ship is keeping its course, if any movements take place around the vertical axis—that is to say, any approach to evolution; how many turns are made by the engine, and if it is working at full speed, or any proportion thereof. The Nausismograph for sailing vessels is constructed on the same system as that for steamers, and differs only in some small modifications for its special use. The Nausismograph was tried on board of the *Calatifimi*, in fine weather and in storms, and gave very satisfactory results.

THE GOLIATH.—It is with much pleasure that we observe from the following account of a recent visit of inspection to the *Goliath*, an old 84-gun ship, which about a year ago was organized as a School and Training Establishment, under the auspices of the Poor Law Authorities at the East of London, that the Institution is likely to prove a great success. We cannot too strongly urge upon the charitably-disposed the deserving claims of such an establishment as this, and we rejoice that its first year of existence has borne such good fruit.

"The visitors were received at the head of the companion-ladder by Captain Bourchier, R.N., and other officers of the *Goliath*, and, after lunch, at which Mr. Thomas Brushfield, of Spitalfields, presided, Mr. Collins, of Poplar, made a short official statement concerning the ship and its inmates. From this it appeared that 449 boys in all had been received on board since the *Goliath* took up her station; sixteen of these have already gone into the Royal Navy, and in a few weeks forty others will be ready to follow their example. Thirteen have gone to sea in merchant ships, and more berths are promised very shortly. For two boys situations have been found on shore, and twenty-five others have either passed to Unions not connected with the training ship or been discharged to their friends. The number of boys on board at the present moment is 393, the limit for which accommodation can be afforded being 500. Mr. Collins entered into details as to the instruction given on board, and mentioned that of the total number of boys no less than 115 were under musical instruction as bandsmen, in addition to the ordinary teaching in seamanship which all the boys alike receive. There are four bands on board, first, second, and third, in addition to a drum and fife band; and the lads, according to their capabilities, pass from one into the other. There are also on board 160 treble and second singers regularly trained, and for

the gratification of the company as they sat at lunch, a species of concert, vocal and instrumental, was given by the young performers, who could not be seen, for they were screened from sight by a drapery of flags, but whose performances were very creditable. For young musicians there is, it seems, a demand in the army, and it was stated that a list of thirty-nine adepts had been forwarded to the Horse Guards within the last few days. The new swimming bath reached the *Goliath* in June; there were then only twenty-nine boys who could swim, now there are 185. After a few words from the Chairman, visitors were invited to go on deck and see the boys assembled.

"Through the exertions of Captain Bourchier and the Ship Committee a respectable sum had been raised by private subscription for the purpose of presenting prizes to the most deserving boys, as the rates, of course, could not be drawn upon for such a purpose; and the ship's company now formed up in hollow square, surrounding the table on which the books, medals, etc., were piled.

"The prizes, of which about one hundred were given away—and Captain Bourchier said he wished heartily that he had a prize for every boy, for "there was not one black sheep among them"—were awarded according to a system calculated to stimulate the better feelings as well as the intelligence of the boys. Thus, while there were prizes for seamanship, for smartness aloft, for the best sail-makers, best coxswain of boats, best tailors, shoemakers, carpenters, painters, buglers, etc., there were also prizes for the best swimmers, best captains of messes, for the boys who kept their clothes or band instruments in the best order, one for the boy who had attended most carefully to the sick, and two for the most popular boys in the ship. It was impossible not to remark what a difference existed between recent arrivals in the school and those who had been a few months or even a few weeks on board the *Goliath*. The school records show that, though commonly feeble and stunted in growth when they embark, numbers of them have since grown two and three inches in height, and as much as two inches round the chest. The boys make everything for themselves. Even the neat Hussar uniform in which band No. 1 plays on the quarter-deck has been cut out and made on board. The form of punishment held in most awe is to be forbidden to row in the boats. This effort to improve the condition of the London Street Arabs is stated on the whole to have been so successful, that it is by no means improbable that several more of our old wooden men-of-war may be utilized in a similar manner at other places."

FOUNDERING AT SEA.—A correspondent calls our attention to the following account of the decayed state in which a vessel must have been sent to sea. We gladly give publicity to the disgraceful act of sending out a vessel in such a condition as she appears to have been in, and we think the circumstances of the foundering fully justify some official enquiry.

A telegram received by Mr. Reuter, from Plymouth, gives the following history of a voyage which terminated a week ago in the foundering of a large ship: "Plymouth, Oct. 5th.—The barque *Balaclava*, of Liverpool, 621 tons register, from London, with part cargo of cement for Miramichi, foundered on Sept. 29th in 49° N., 29° W. Her crew, sixteen in all, were rescued by the Spanish barque Rio de la Plata, from Havannah, with sugar and tobacco, for Antwerp, and landed by a pilot cutter to-day at Plymouth. The *Balaclava* left London some four months ago, and when in the Downs part of the crew refused duty, and were sent to prison. She proceeded as far as Portsmouth, and there was docked and repaired. She then went on to Plymouth, arriving on September 6th in a very leaky condition. There her then captain (Lelean) and the whole of the crew left her. Another captain and crew were engaged, and the leak stopped. On September 26th she proceeded on her voyage, and shortly after getting to sea she sprang a leak again, and three days after sailing from Plymouth foundered."

PAPERMAKING IN JAPAN.—An interesting blue-book has just been published, comprising the reports of our consuls in the East upon the manufacture of paper in Japan, addressed, through Sir Harry Parkes, to Lord Granville. They will serve to show that, whether or no there is any real ground for fearing that the supply of rags for the papermakers here may fail, at all events in the far East there are resources which might easily be utilised and imported into the West. Messrs. Lowder, Annesley, and Emslie, each preface their reports by some remarks on what may be termed the antiquarianism of the subject, showing that the manufacture of substances for the purpose of writing in Japan dates from the early part of the seventh century of the Christian era. Consul Lowder devotes his report mainly to an account of the cultivation of the paper-mulberry *(Broussonetia papyrifera)*, its planting, cutting, preparation, etc., including the various processes of steaming, stripping, drying, washing, removing the inner fibre, squeezing out the sap, boiling and pounding the fibre, making the "Hanshi," drying, cutting it into sizes, and packing it. He adds a brief account of the treatment of the "tororo," a plant of the bean kind,

which is also used for the manufacture of paper. Mr. Annesley gives a similar account of the processes employed in making paper out of the Japanese shrub "kiji," which, as he tells us, grows all over Japan, and is cultivated much in the same manner as the tea plant and mulberry tree. He says, that there is no reason why this "kiji" plant should not flourish in England, especially in places where the soil is damp. He adds a formal opinion to the effect, that as the paper could no doubt be manufactured from this bark at a cheaper rate than it can be made from rags, and as it possesses considerable strength, and is applicable to an almost infinite variety of purposes, the cultivation of the plant in England is well worthy of a trial. Mr. Emslie devotes his report to a similar account of the planting, cultivation, and manipulation of the makoso or paper plant, which appears to be equally suited to our manufacturing requirements. It should be added, that Consul Lowder's report is illustrated throughout with most curiously coloured Japanese pictures, descriptive of every process of the manufacture in succession, from the planting of the shrub down to the final process of packing it for export in a prepared state. Each of the three consuls also subjoins to his report a formidable list of the purposes to which the Japanese apply the paper which they manufacture, including not only writing, drawing, and letter paper, paper for walls, for making notes, for wrapping parcels, for government despatches, etc., but also for pocket handkerchiefs, for umbrella coverings, for hair ornaments, for purses, for pocket-books, for tobacco-pouches, for fans, and finally for raincoats, like our macintoshes. It appears from the correspondence prefixed to the volume, that the reports were originally prepared at the suggestion of Lord Clarendon, while he was in office, and that various specimens of paper manufacture mentioned by the consuls in their reports have been sent home to be deposited in the South Kensington Museum.

THE TRADE OF THE PERSIAN GULF.—In a return recently presented to Parliament a most interesting report, made by Colonel Pelly to the Indian Government, on the Trade of the Persian Gulf, is published. The report is supplemented by various statistical statements relative to the trade between Calcutta, Bombay, the Province of Sind, and the Ports in the Persian Gulf. These statements shew that the trade has been steadily increasing since 1845; indeed, it appears that between the years 1845 and 1866, the trade quintupled itself. In a further report Colonel Pelly observes that, "The fact seems to be that the Gulf Trade is capable of indefinite

development, provided freights be sufficiently low to admit of produce competing with that of other countries in foreign markets; in other words, the Gulf being the only ocean basin for a vast range of territories, the resources of those territories will increasingly seek the ports of the Gulf, provided they can be exported at a profit."

With reference to the steamers which have recently engaged in the trade, we learn that they all appear to have found full cargoes at rates which, although lower than those which obtained in former years, still pay. Several energetic mercantile houses are endeavouring to open up trade with the interior of Arabia and Persia, and there is great reason to suppose that its further development would be very successful to those engaged in it. We learn that a line of steamers has recently commenced to run between Constantinople and the Gulf; that two Persian Companies are running under the British flag, between the Gulf and British India, which route will also be probably adopted by the British India Steam Navigation Company for a weekly steamer; and further that a line of steamers is organized to run between London and the Gulf viâ the Suez Canal.

Apprentices to the Sea Service.—The following Circular has been issued by the Board of Trade:—

"The Board of Trade have from time to time proceeded against persons in London and elsewhere who have been in the habit, although unauthorised by law to do so, of advertising employment for boys and Officers for the Sea Service. They regret to find that, in spite of the warning conveyed by these proceedings, and notwithstanding the penalties to which they render themselves liable, Owners and Masters of ships, as well as parents and guardians of boys, are often still so unguarded and ill-informed as to employ these unauthorised and unqualified advertising Agents instead of the Officers duly appointed by law to enrol Apprentices, and to facilitate their employment in British ships.

"The Board of Trade, therefore, think it right to point out to the friends and relatives of boys and persons seeking employment at sea, as well as to the Owners and Agents of ships, that by the 141st section of 'The Merchant Shipping Act, 1854,' all Superintendents of Mercantile Marine Offices are required to give to 'persons desirous of apprenticing boys to the Sea Service, and to Masters and Owners of ships requiring Apprentices, such assistance as is in their power for facilitating the making of such apprenticeships.' The Board of Trade regard this as one of the most im-

portant duties thrown by the Legislature on Superintendents; and, in order to carry the intention of the Statute into effect, each Superintendent is directed to keep two registers—one containing a clear and methodical record of the names, ages, addresses, and other particulars received by them with respect to boys seeking employment at sea, the other containing the names of Owners who are desirous of obtaining boys for their ships.

"It is important that Owners and Agents should be aware of this arrangement, so that when they require the services of boys or youths, they may apply directly to a Superintendent of a Mercantile Marine Office, instead of a slop-seller or other person not authorised by law to procure employment for Seamen.

"To widows (who appear to be frequently deceived by persons styling themselves Shipping Agents or Agents for supplying Seamen, but who in reality gain their livelihood by plundering the unwary or ill-informed), and to all other persons having the charge of boys and wishing to apprentice them to the Sea Service, the Board of Trade would point out that the authorised Superintendents at the Government Mercantile Marine Offices (there is one at every port), who will register the boys' names as applying for employment, have more facilities for finding employment at sea for a boy than any other person, and are, besides, the only persons who can legally receive any remuneration for doing so. The fee for each apprenticeship effected with the Superintendent's assistance is limited to 5s. Those of the public who continue, in the face of the caution issued by the Board of Trade, to employ and pay persons by law unauthorised to procure employment on board ship for boys, are not only wasting their money and incurring a penalty in each case of £20, but are absolutely encouraging the breaking of the law, as well as aiding the crimp and slop-seller in setting aside those Officers whose duty, under the law, is to enrol apprentices.

"The Merchant Shipping Act, Section 147, provides that—

"'1. If any unauthorized person engages or supplies any Mate, Seaman, Midshipman, or Apprentice to be entered on board any ship in the United Kingdom, he will be liable to be prosecuted, and, if convicted, to a penalty of £20 for each offence.

"'2. If any person employs any unauthorised person, he will be liable to be prosecuted, and, if convicted, to a penalty of £20 for each offence.

"'3. If any person knowingly receives or accepts to be entered on board any ship any Mate, Seaman, Midshipman, or Apprentice illegally engaged or supplied, he will be liable to a prosecution, and, if convicted, to a penalty of £20 for each offence.'

"And by the 148th Section,—

"'Any person, other than the Superintendent of a Government Mercantile Marine Office, who demands or receives, directly or indirectly, any remuneration whatever from any Mate, Seaman, Midshipman, or Apprentice, for obtaining them employment, will be liable to a prosecution, and, if convicted, to a penalty of £5 for each offence.'

"Any parent, guardian, Officer, Seaman, or Apprentice who has paid to any agent, slop-seller, crimp, or other unauthorised person, any sum for obtaining employment on any British ship in the United Kingdom, should at once communicate full particulars in writing (giving the names of the parties and of witnesses), to the Registrar General of Seamen, 6, Adelaide-place, London Bridge, E.C., from whom may be obtained, free of charge, a printed list of persons authorised to engage or supply Mates, Midshipmen, Apprentices, Boys, and Seamen for the Merchant Service, together with a list of the names of some unauthorised persons who have been convicted, but who still advertise in their own or in other names.

"The Board of Trade trust that Shipowners, Shipmasters, and Officers, parents and guardians of boys, and Superintendents of Mercantile Offices, will co-operate with them in opposing to the utmost and in bringing to justice any person who may hereafter unlawfully receive money for obtaining employment for Seamen and Apprentices.

"THOMAS GRAY."

HER MAJESTY'S SHIP HECATE.—Another addition to the Royal Navy has just been made in the launch of the twin screw armour-clad turret-ship *Hecate*, four guns. This vessel, built by Messrs. J. and W. Dudgeon, is one of four vessels called the *Cyclops* class of *Monitor* turret-ships, ordered by the Government about twelve months ago. Two were ordered from shipbuilders on the Thames, the third on the Clyde, and the fourth on the Tyne. The *Hecate* is the second launched. These vessels are intended for the defence of our coasts and channel seas, and it is confidently expected that they will prove themselves good seaboats. Two vessels constructed on a similar principle have made excellent passages—one to Melbourne, the *Abyssinia*, built by Messrs. Dudgeon, and another, made for the protection of our Indian possessions, to Bombay. There are no masts, the constructors trusting entirely to what Admiral Rous calls the "tea-kettle" for the means of driving the ship. She will be propelled by two four-bladed screws, worked

by two pairs of engines of 250 nominal horse power, made by Messrs. Miller and Ravenhill on the Thames. The ship will be completed in the Millwall Docks, and will afterwards be sent to Devonport. One of the speakers at the ceremony of launching the vessel said that, since this ship would be only four feet out of water it might be apprehended that there was danger of her capsizing, but it must be remembered that the vessel was designed for service near the shores of Great Britain, and he was convinced that she was capable of safely conducting the duties of coast defence. If it was necessary to send her to the other side of the world the erection of temporary iron cabins on her deck would enable her to weather the heaviest ocean storms.

THE ECLIPSE EXPEDITION.—Once more an English expedition, under the charge of Mr. Lockyer, has set forth to view the phenomenon of a total eclipse. Six weeks and a half hence, if all go well, those observers who have sailed in the *Mirzapore* will be anxiously waiting, at various stations in the north of Ceylon the approach of those two minutes and a half of total obscuration on which so much will depend that is interesting to men of science.

Observing parties will be stationed in India, Java, and Northern Australia—and the task set before them, is altogether more difficult than any which has hitherto been attempted. It would not be difficult to repeat the observations made during the American eclipse of 1869, and during the Mediterranean eclipse of 1870; but to do this would be to do nothing. Something new must be learned, or the expedition might as well not have sailed. Our expeditionists have set forth with this purpose, and the fault will not be theirs if they are unsuccessful. To encourage them to strenuous exertion they have this to consider, that if they fail, many months must pass before astronomers have another opportunity to institute such researches as they now propose to make. Not until April 16th, 1874, will there be another eclipse worth an eclipse expedition; and in these days of rapid scientific progress an interval of twenty-eight months seems like an age. Our observers then in India and Ceylon, as well as the continental astronomers in Java, and colonial astronomers in North Australia, are bound to exert themselves most diligently, so that astronomers may not want eclipse *pabulum* during that long interval.

As far as instruments are concerned, the observations ought to be of the greatest value and importance. The experience of former expeditions has added very greatly in bringing the instruments to perfection, and with advantageous weather, it is to be hoped that

the Corona will at last be hunted down. The photographers, whose efforts were much hindered at the last Eclipse by obscuring clouds, are prepared with improved apparatus to make the very most of whatever opportunities they may have on this occasion.

The telescopists and spectroscopists, draughtsmen and general observers, will watch the phenomenon with anxious interest, and if the results obtained are at all proportioned to the genuine zeal and energy which actuate the scientific men who have gone out with the expedition, we may fairly hope that they will be of the greatest value. Our hearty wishes for their success go with them, and we trust no obscuring clouds or other interposing accidents will prevent their being as successful in their observations as they deserve to be.

The Eclipse Committee of the British Association, consists of the following gentlemen :—Sir William Thomson, LL.D., F.R.S., President, Professor J. C. Adams, D.C.L., F.R.S., G. B. Airy, F.R.S., Astronomer Royal, Professor Clifton, F.R.S., Warren de la Rue, D.C.L., F.R.S., Dr. Frankland, F.R.S., Captain Douglas Galton, C.B., F.R.S., George Griffith, M.A., J. R. Hind, F.R.S., W. Lassell, F.R.S., President R.A.S., Lord Lindsay, J. Norman Lockyer, F.R.S., General Sir Edward Sabine, K.C.B., President R.S., General Strachey, F.R.S., W. Spottiswoode, LL.D., F.R.S., Colonel Strange, F.R.S., Professor Stokes, D.C.L., F.R.S., and Dr. Thomas Thompson, F.R.S., have had very hard work to get the arrangements completed, in which they have been most zealously assisted by the Government, and by the Peninsular and Oriental Steamboat Company. Lord Lindsay placed at the disposal of the Expedition the whole of his valuable instruments, and has sent a photographic observer at his own expense. Several members of the Expedition have voluntarily given up a month of their time before starting, to perfect themselves in spectroscopic and other observations at the Royal College of Chemistry, a most commendable example to others in similar situations.

Experiments with Gunboats.—Captain Boys, commanding the *Excellent* gunnery establishment at Portsmouth, has recently been engaged in making some experiments with the *Comet* and *Blazer* class of twin-screw gunboats, to ascertain the comparative amount of roll the little vessels would have when steaming through a beam sea with their 18-ton gun raised on its platform, and with the gun and its platform lowered into the recess built to receive it in the vessel's hold. With the gun and platform raised for action the roll on the vessels was found to be long and deep. With the gun and

its platform lowered into the vessel's hold, the roll was found to be short and quick. The colour adopted for painting these gun-vessels is a French gray. Of 245 tons only, and with twin-screw engines of twenty-eight (relative) horse-power, the strong argument in favour of this tiny flotilla is the 18-ton rifled gun each of them carries, and the handiness under steam given them by the reversible action of their screws. On the other hand, a strong argument against any great increase upon the present number of such vessels may be founded upon the fact that a 12-pounder shell from any ordinary steam-cutter or launch striking their hulls, and bursting in board, must inevitably sink them, big gun and all.

TO CORRESPONDENTS.

In reply to the enquiry of "Engineer," we can only state what must be obvious to any nautical man, that in a ship describing a circle going ahead or astern, and with the rudder hard over, the stem and the sternpost are equi-distant from the centre of the circle.

We have received the first number of the new publication "Jahrbucher fur die Deutsche Armee und Marine" (Annals for the German Army and Navy), and hope to notice it in our next.

We have to thank Captain Toynbee for his obliging communication concerning the recent West Indian Hurricane; it reached us too late for insertion in this number but it shall appear in December.

Errata.—We have to call attention to a misprint in our October number. In the notice of "Meteorology of Cape Horn and the West Coast of South America," the word "Africa" is erroneously substituted at page 738.

Also on page 741, line 1, *eastern* side should be substituted for *western* side.

Charts, etc., published by the Hydrographic Office, Admiralty, in October, 1871.

Sold by J. D. Potter, 31, *Poultry, E.C.*

2429	m =	1·0 / 2·5	Dardanelles with plan of Narrows.
107	m =	3·6	Matoya Harbour, Nipon, Japan.
1198	m =	2·0	The Bosphorus, with plans of the Golden Horn, Beikos, Umur, and Buyukdéré Bays.
120	m =	1·0	Schelde River entrances.
1703	m =	1·0	Wilson Promontory, with Corner Inlet and Port Albert.

THE

NAUTICAL MAGAZINE.

NEW SERIES.

DECEMBER, 1871.

NAVIGATING OFFICERS.

Much has been said, and more written, lately, on the vexed question concerning the navigating class of the Royal Navy, as to whether it would be an advantage to the Service to retain it as a separate class for the purpose of navigating and piloting Her Majesty's ships, or to abolish the class and leave the duties to be performed by the other branch of the executive; so that a captain of a Man-of-war would also be the navigator and pilot, having an aid in one of the lieutenants who would be set apart for that duty. Not only has this been the constant theme of the naval papers, but the daily press has taken the matter up so warmly, that we are safe in saying that it has created a greater display of feeling and comment than any one subject of the internal policy of the Navy for a very long time.

That the present state of things is unsatisfactory, and that some change must be made is generally admitted; for the reason, on one side, that the present divided responsibility is not conducive to the safety of the ship, and on the other, that it is unwise, and, indeed, almost impossible to retain a class of officers, such as the navigating class has now become, in the inferior position they at present hold. They are deprived of all positive rank, and debarred from the possibility of attaining the higher rewards and honours accorded to their brethren of the other executive class, and were their class abolished, the very qualifications which now tend to keep them in a subordinate position would be the means of raising the other, as the best navigators would naturally be considered the best commanders.

Considerable ignorance has been displayed by civilian, and much contrariety of opinion among professional writers on the subject; the former have made a strange jumble, apparently assuming that seamanship, navigation, and pilotage were one and the same thing, and that because a man possessed a knowledge on one of these points, it was quite a natural thing for him to take up the others, and, therefore, that no necessity exists for retaining a special class as at present. The latter are divided in opinion, some truly acknowledging the class to be too valuable to be done away with, while some consider them unnecessary, and that the duties could be transferred without detriment to the service; one officer even goes so far as to call the class *useless, nonentities*, and *nurses for incompetent captains*. Those composing the navigating class are by no means unanimous in opinion as to the advisability of the class being abolished, and we even venture to say that if the disabilities under which they labour were removed, the majority would prefer remaining as a separate class, and also believe that in doing so it would be for the best interests of the service to which they belong.

In this state of things the question arises, who are the best judges of what is best to be done? and without offence, we would first say who we believe are *not* the best judges, and these may be classed as the very old officers and the very young ones. The elders, old admirals, in considering the subject, do so from the point of view of their time, when the masters were a rough and ready set of men, greatly to be respected for their thorough knowledge of seamanship, hard work, navigation, and pilotage, under all difficulties, who were in their place, simply as Masters, and as they were very generally taken from the Merchant Navy, were content with the lowly station they were placed in. To speak plainly, they were not considered—and were not—highly educated men, and were more useful than ornamental. Those who have a personal knowledge of the men of the present day, will at once perceive that, imbued with these views, the old officers are not the best judges.

The younger ones would naturally be opposed to a change that would bring a class of officers they have always looked upon as inferiors, not only to be their equals, but to rise above them; these officers, not having experienced the responsibility of charge, cannot know the feelings of, or be able to judge as those that have, and many are opposed to a change by reason of the influx of a large body into their already overcrowded lists.

Of the opinions of the navigating class itself, we would say the same; the elders may be influenced in their opinion, by personal

motives and by the remembrance of their own experiences, while the young by their want of experience and natural ebullition of youth are incapable of giving a sound opinion.

We would therefore, to arrive at a just conclusion, prefer consulting a number of captains and commanders who have been in command of *bona fide* Men-of-war, and also a number of staff commanders and navigating lieutenants now serving; the former could well judge of the qualifications of the men of the present day, and of their own ability or inability to undertake the duties and responsibilities in addition to those they at present have, and also in regard to a change in position in respect to rank, should they deem it advisable to retain the navigating class.

The opinion of the navigating officers would elicit "where the shoe pinches," and although they may, in the interest of their class, suggest measures that would require modification, still much truthful and useful information would be obtained that could not fail to be of great value in determining the *vexato questio*.

We throw out these preliminary remarks by way of warning to our readers not to be misled by the conflicting views expressed on this important subject. In considering the matter, we propose to be guided by our own knowledge of the subject, and to criticise, as impartially as we are able, the various opinions that are afloat in relation to it.

Admiral Ryder, in a letter to the *Army and Navy Gazette*, has well put the question:—"How can Her Majesty's ships be navigated and piloted with the greatest boldness consistent with the greatest security?" and he adds, "If we agree to this as a starting point, and that all other questions be held subsidiary, the ground will be cleared of a great deal of extraneous matter;" and yet it seems to us that the gallant Admiral, in the course of his argument, diverged widely from the axiom he himself laid down; still there was so much bearing on the subject, although not altogether void of class feeling, that it is entitled to respect. Admiral Ryder avoids the main question, for although advocating the retention of the class, he does not advocate an alteration in their position or eligibility for advancement from the subordinate rank they fill, and we hold that the one question is inseparable from the other.

We do not see that there can be any reason whatever why an officer, as a lieutenant, could not become as expert a navigator and pilot as any in the navigating class. Educated as they are, in precisely the same way, and to the same extent, it is ridiculous to assert that the one class possesses special advantages over the other,

or has special abilities for their vocation; the difference arises simply from the direction of the mind for the purpose intended, and we can well believe that many a lieutenant and commander would make better pilots than some of their brethren of the navigating class, if a necessity arose for exercising their talents in that way. Nothing can be in worse taste, or worse for an argument in this case, than attempting to elevate the abilities of one class at the expense of the other.

Referring to the question as put by Admiral Ryder, we at once give in our opinion that it would be conducive to the safety, and the greatest boldness of navigation and pilotage, consistent with the greatest security, to retain *a* class for the special purpose—but not *the* class of navigating officers as at present constituted; and this opinion is founded on the following reasons.

The great strides that have been made of late years, both in the construction and armament of war ships, have greatly increased the responsibility of their commanders. Gunnery has become a science requiring much study as well as practice, and even the mode of governing a crew requires much more consideration than formerly. Even seamanship, although from the use of steam, on the decline, has to be considered in another light than formerly, on account of the great increase of top weight with which a ship of the present day is lumbered. Those who know the numerous duties attached to a captain of a ship, would not consider it desirable to add to them, and any assertion to the effect that *because* a captain, by the Queen's instructions, is responsible for the safe navigation of his ship, there would be no addition to his duties, is simply a legal fiction, as in fact is his being so responsible. True he is made to suffer if an accident happens to his ship, but in most cases it is unjust that it should be so, the more especially in pilot waters, when the ship is virtually in charge of the navigating officer, in the same way as if a licensed pilot were on board.

That every officer should be able to navigate his ship, and know the principles of the art in all that relates to prevalent winds, currents, great circle sailing, etc., or the way to make the shortest passage, is fully admitted and should be insisted on, and this a lieutenant could do as well as a navigating one if detailed for that duty. It is a matter that requires but little study and attention, and is not dependent on constant practice; but it is not so with pilotage, that requires experience, and the greater the experience the better the pilot, as experience gives confidence. It has been asked, What experience has a navigating lieutenant had on his first appointment? We admit, none, and it is with fear and trembling

he first pilots a ship; but that very act begets confidence, which increases as he proceeds, because he is kept to the work and makes it his study; whereas, if the duty were entrusted to a lieutenant temporarily detailed for the purpose, he would not naturally give the same undivided attention, or if he did, he would no sooner become a good pilot than he would have to give it up, for it would be absolutely necessary for every lieutenant to become a good pilot, that he might be able to bear the responsibility as a commander and captain, and this we maintain is impossible, simply from the number of lieutenants and consequent want of experience.

It is very clear that although there may be a dozen navigators to a ship there can be but one pilot, and the latter duty divided among the lieutenants would not make an experienced pilot; if the duty were confined to one, there would then be lieutenants promoted to the rank of commander, and onward to captain with no more knowledge of pilotage than at present. We therefore unhesitatingly say that for the sake of this very experience which at special times becomes so valuable, it is worth while retaining a class for navigation and pilotage, and that this could be done without keeping it in the subservient and anomalous position of the present class. We also believe that the result would be that in a very few years the ill feeling that at present exists between the two executive classes would be a thing of the past, and to commence this we would propose that the classes should not, as at present, begin with a separate existence but should start from one stem, and the stem should have good growth before the shoots should be allowed to diverge.

To state this matter plainly we would suggest that the executive class should enter simply as cadets, and be educated as at present, and that as midshipmen their studies should be directed to the bias they form to the one class or the other, and that on the completion of their time, the examinations should decide their future course in the service, the one passing for a higher class of gunnery and any other subject that may be considered necessary, the other passing for pilotage, surveying, mechanics, mathematics, construction of lighthouses, canal cutting, submarine blasting, formation of docks, etc., or in other words, as we have in a previous number described it,* to be fitted to be to the navy, what the engineers are to the army, viz., a practical scientific corps, which might well be called, as at present, the "staff corps." It is certainly not creditable to the navy that soldiers should be employed to construct docks for their ships, or blast rocks for them to go over.

* See page 528.

The staff class would be the future navigating officers having their duties defined, and holding for all purposes, except command on board a fighting ship, relative rank according to seniority, and would be for all purposes connected with the safety of the ship, the advisers of the captain. As staff sub-lieutenants they should if possible always have experience in gunboats or small vessels, whereby to gain practice and confidence in pilotage, in order to render them more fitted than at present to undertake the charge as pilot of the larger ship when promoted to the rank of staff lieutenant.

One thing is very clear and admitted as essential, and no scheme could be admitted without it, viz., that the captain is supreme in his command; but for purposes of navigation and pilotage the present law or regulation that requires the officer of the watch to obtain the captain's order for the alteration of the course of the ship, or to alter sail or steam in such manner as the navigating officer may think desirable in pilot waters, is simply absurd, and has been, and ever will be, the cause of many accidents. With the captain on deck it is another thing, and the navigating officer should therefore be as personally responsible for the safety of the ship when in pilot charge, and the captain as exempt, as if a licensed pilot were on board.

Whatever duties it may be considered advisable to allot to the staff class in addition to navigation and pilotage, they should be defined and distinct, and not, as at present, undefined, so that the navigating officers would not be liable to be called on for any ordinary duty such as keeping watch, answering signals, etc., which we have known them to be obliged to do under circumstances that could be avoided; this would at once have the effect of raising the class.

We have already said that they should rank with the executive class according to seniority; but it is evident that were the command of the ship to devolve on them by reason of that seniority, it would be most inconvenient for themselves and also the other executive branch; and as the navigating officer is not so proficient in gunnery, and perhaps some of the minor details of a lieutenant's duty, he should therefore always be subordinate to the senior lieutenant on board, who would virtually be the captain for the time being, as commanding officer.

To the staff class, the surveys and command of surveying vessels should be entrusted, they should also fill the posts in the Hydrographic department of the Admiralty, as staff commanders and staff captains, they might command troop and store ships and

yachts, in fact all vessels not fitted especially as combatants, and while in such independent commands they should be *bona fide*, the same in point of rank as others. As staff captains they may fill, as at present, the positions of masters' attendants, and as staff admirals they would be the most fitted for the posts of admiral's superintendent, and one at the Board of Admiralty for the control and supervision of the dockyards would ensure a head thoroughly acquainted with the business.

We can well imagine the laugh of derision with which these views will be received by many, and that they will be called Utopian, visionary, and ridiculous; but no great changes have ever been first broached or effected, without having a class of opponents and mockers, but the changes have nevertheless come to pass. We may instance the disestablishment of the Irish Church in support of this, it was at first ridiculed, it could not be, it would be confiscation, robbery, in fact impossible, and yet it came to pass.

Some will say that to raise the navigating class in that way would be subversive of good to the service; but we may ask in reply if the Royal Engineers are a detriment to the army in general? and with regard to raising the present navigating class it would be but for a time, and arrangements could be made for changing from one class to the other according to fitness; in a very few years the classes would be so mixed, yet so defined, that all the feelings of envy and class feeling would be abolished, an end, by whatever means effected, most devoutly to be wished.

We are not vain enough to suppose we could fill in the details of the outline we have sketched, but we believe that in thus abolishing the navigating class and raising another, a most valuable and much needed class of officers would be created, on whose shoulders would rest grave responsibilities, practical and personal, while others, already overburdened, would be relieved, and not have to suffer for the acts of others. At all events it is with no wish or intention to raise one class above another, or to elevate one at the expense of the other, that we have taken up this subject, but simply and truly from an earnest desire to suggest some method to allay the ill feeling and jealousies that at present exist, and to point out how it may be done without injury to any, and to the benefit of the glorious service of which the navigating class are by no means the least worthy.

HURRICANE IN THE WEST INDIES.

With respect to the hurricane of 21st August, some few details of which were published in our October number, we are now enabled, through the kindness of Captain Toynbee, of the Meteorological Office, to give our readers some further interesting and useful particulars. The very careful observations of Captain Dix, of the *Mersey*, are rendered still more valuable by the corroborative testimony of Captain Houston, of the *Florence*, and the track of the hurricane, and its speed, may be considered to be pretty accurately shewn. Such records as these are reliable data for determining the laws which regulate cyclonic visitations, and all nautical men who take note of the phenomena attending them and forward the descriptive particulars to the Meteorological Office, or elsewhere, in order that they may be published for the general information of mariners, are adding their part to the knowledge of the world; and not only that, but are doing good work in the cause of humanity at large by making known what indications exist of the approach or vicinity of a hurricane, so that mariners may be warned in time, and have a chance of avoiding the disastrous consequences which too often follow from complete ignorance on the subject.

To the Editor of the Nautical Magazine.

Meteorological Office, 116, Victoria Street,
London, S.W., October 23rd, 1871.

Dear Sir,—With this I send you an interesting letter and careful observations from Captain Dix, of the R.M.S. *Mersey*, respecting the hurricane which passed over St. Thomas on August 21st of this year. If his example were followed by other captains and observers at the various stations over which they pass, we should soon know more about them. Yours faithfully, Henry Toynbee.

Royal Mail Steamer *Mersey*,
St. Thomas, September 28th, 1871.

Sir,—Some time ago I sent you an account of a hurricane that the R.M.S. *Seine* passed through, on a voyage from Southampton to this port; you then asked me to furnish you with particulars of any other hurricanes, etc., I might happen to encounter. As you are doubtless aware, a very severe hurricane passed over St. Thomas, on August 21st, of this year. I was then lying here in command of this ship, and the following are observations taken by me during the hurricane. I may mention that at 0.30 p.m.,

when we were just entering the hurricane, I placed an officer by the barometer, and he noted the height of it carefully during the time the hurricane lasted.

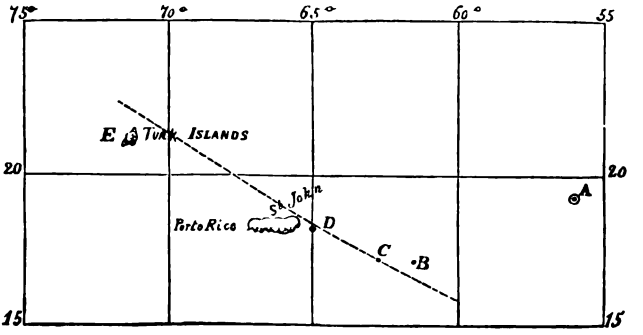
Sunday, August 20th,—The wind was puffy from N.E. to N.N.E., barometer standing at its normal height, and the usual barometrical tide ebbed and flowed morning and evening,—bar. ranging from 30·00 in. to 30·07 in. After 10 p.m., August 20th, the bar. fell in the usual way, but it continued falling longer, and fell lower than it ought to have done, and at 3 a.m., August 21st, stood at 29·90, the wind was puffy, but the weather fine all night; I now watched for the rise of the mercury, as, if the weather was going to be fine, the barometer should have shown symptoms of rising before 6 a.m.; however, at 6 a.m. it was still 29·90, the mercury rather concave, and the puffs, wind N.E. to N.N.E., rather stronger. I now felt quite sure that bad weather was approaching, and gave orders to get steam up, etc., etc. Our engines were in pieces, and the boilers under repair; however, we managed to get steam before the worst of the hurricane came on. The weather remained the same, only perhaps a little more squally, and the barometer remained stationary till 9.45 a.m., and then began to go down; 10 a.m., bar. 29·88, noon, bar. 29·82, squalls getting heavier; 1 p.m., bar. 29·78, wind N.N.E., squalls very heavy. We were now I consider just entering the hurricane; 2 p.m., bar. 29·50, N.N.E., very heavy gusts of wind; we now saw roofs of houses, shingles, etc., etc., blown about on shore and whirling about in the air; leaves of trees had been flying over our heads for some time. About this time the English barque "*Duke of Wellington*," which was lying outside the harbour, parted her cables, and went on shore, and was totally lost; crew saved: 3.30 p.m., bar. 29·38, terrific gusts of wind. About this time the wind veered to N., the hurricane, which had hitherto been travelling about W.N.W., having apparently changed its course when it got among the Virgin Islands to about W. or W. by N., no doubt being influenced by the high land of Tortola and St. John's. From this time (3.30 p.m.) till 5 p.m., when the calm began to pass over us, the gusts were terrific, the wind coming down between the hills in regular whirlwinds, sometimes from N.N.E., sometimes from N.N.W., the true wind being about N., or a little to the eastward of N.; the direction of the heavy gusts was caused by the formation of the land. The force of the wind was now terrific, and it was during this last hour and a half of the northern gale that most of the damage was done on shore. The bar. was falling rapidly all this time, and at 5 p.m., when the calm commenced it stood at 28·74. The calm lasted from

5 p.m. till 5.35 p.m., during which time there was perfect stillness, and I believe a candle would have burnt in the open air. At 5.25 p.m. the bar. reached its lowest point 28·62. At 5.35 p.m., as I saw the ripple of the southerly gale coming along the water, the officer stationed by the bar. called out, "The barometer is rising, Sir;" and directly the wind struck us it began to rise fast, being at 5.40, 28·71, at 6 p.m. 28·93, and at 7 p.m. 29·60. At 5.35 p.m. the second part of the hurricane commenced, wind S. by W., very heavy indeed, but, there being no high land to the southward, the wind was steady, and there were none of those terrific gusts and whirlwinds as during the northern gale, so that comparatively very little damage was done by the southern gale. It blew very hard till 8 p.m., and then the wind moderated to a fresh gale, strong breeze and squally at midnight. The weather was very unsettled for two days, heavy rain, thunder and lightning, etc., the atmosphere being disturbed for a much longer period after the hurricane than it was before it came on. The barometer did not recover its normal height, nor its daily ebb and flow until three days after the hurricane.

I enclose a rough track of the hurricane as far as I have been able to trace it, with its estimated rate of progress from place to place, diameter of calm centre, etc., etc.

Trusting that these remarks, of which you can make any use you please, will be of some service to you, and the office of which you are director, I remain, Sir, your obedient servant,

(Signed) STEPHEN DIX,
Commander R.M.S. *Mersey*.



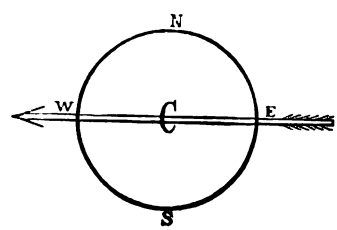
N.B.—The dotted line represents the path of the hurricane; it appears to have turned more N. after passing Porto Rico, as it passed to northward of Turk Islands.

A is the position of the German brig *Emma Crag*, at noon August 20th, wind E.N.E. to E., bar. 29·56, and falling. This shows the hurricane was somewhere to the southward of this position.

B. (Antigua).—About 6 a.m., August 21st, the centre passed to the southward of Antigua, the wind shifting suddenly from N.N.E. to E., and E.S.E., etc., showing that the centre passed just to the S. of Antigua.

C. (St. Kitts).—At 8.50 a.m., August 21st, the calm centre began to pass over Basseterre, St. Kitts, the calm lasted twenty-two minutes, so that the centre of the calm passed over Basseterre at 9 a.m. From the way the wind veered at St. Kitts, and from the fact that the calm only lasted twenty-two minutes, I think that the southern part of the calm and not exactly the centre passed over Basseterre.

D. (St. Thomas).—As stated in my letter, the calm commenced here at 5 p.m., lasting thirty-five minutes, the middle of the calm passing over us at 5.17 p.m. The distance from St. Kitts to St. Thomas is 141 miles, which shows that the storm was travelling at the rate of 17 miles per hour, and therefore the diameter of the calm centre was about 10 miles; and I should think the diameter of the whole hurricane from 130 to 140 miles. Santa Cruz, which is 40 miles S. of St. Thomas, felt very little of the hurricane, being in about the position we were in at St. Thomas at 1.30 p.m., as regards the distance from the centre of the storm, when the centre was nearest to them; and as the wind at Santa Cruz came straight from the sea, and was not influenced by high land, there were no heavy gusts as at St. Thomas; and from what I have seen and read about hurricanes, I imagine that there is less wind at points at right angles to the path than there is at points the same distance from the centre, in the path of the hurricane. For instance, suppose the accompanying diagram represents a hurricane travelling W., there will always be more wind at the points W. and E. than there is at N. and S., though they are all equidistant from the centre C.



E. (Turk's Islands).—The hurricane passed just to the northward of Turk's Island about midnight of August 22nd. The observations taken at Turk's Island do not seem very trustworthy, but that is

the time the centre passed there according to the accounts received here. Turk's Island is 504 miles from St. Thomas, and supposing the centre passed there at midnight, August 22nd, the hurricane would have travelled about 16 miles per hour from St. Thomas to that place. I have not been able to trace this hurricane beyond Turk's Island.

P.S.—Another hurricane passed just to the northward of St. Thomas at 6 p.m., September 26th, I was at St. Juan's, Porto Rico, at the time, and remained there all night, and had no bad weather. The captain of an English brig which arrived here to-day informs me that on September 26th (noon), Sombrero bore from him S.S.W. 50 miles; strong gale from E.N.E. veering to E.S.E. and S.S.E., so that this hurricane must have passed close to Sombrero—the brig being N. of it, and St. Thomas S. of it, and will doubtless be heard of in the neighbourhood of Nassau (New Providence).

(Signed) S. Dix.

To the Editor of the Nautical Magazine.

Meteorological Office, 116, Victoria Street,
London, S.W., October 31st, 1871.

Dear Sir,—Since I sent you the letter and observations from Captain Dix, of the R.M.S. *Mersey*, respecting a hurricane which passed over the Island of St. Thomas at 5 p.m. of August 21st, 1871, I have received the accompanying extract from the log of the *Florence*, Captain Thomas Houston, which seems to show that the same hurricane was north of that ship about midnight of August 17th, 1871, she being in about 13·26 N., 37·57 W. Now supposing that its centre was about 60 miles to the north of her at midnight, and that it passed over the Island of St. Thomas at 5 p.m. of the 21st, we are able to calculate its course and speed per hour to have been about N. 82° W. 17·7 miles.

It will be seen that Captain Dix estimated its speed to have been 17 miles per hour, from the time which it took to travel from St. Kitts to St. Thomas.

If we are right in supposing these observations to refer to the same hurricane it is shown to have come from a spot nearly 1600 miles to the eastward of St. Thomas, where it was nearly four days before it reached that Island.

I remain, Sir, yours faithfully,

Henry Toynbee, *Marine Superintendent.*

Extract from Log of ship *Florence*, Captain Thomas Houston, 17th and 18th August, 1871.

Date, 1871.		Latitude.		Longitude.		Temperature of Sea Surface.	Ship's Head.	Winds.		Barometer.		Thermometer.		Clouds.		Weather.
Month.	Hours	Observed N.	D. R. N.	Observed W.	D. R. W.			Direction.	Force	Height.	Attached Ther.	Dry Bulb.	Damp Bulb.	Form or Character.	Amount 0—10.	
Aug. 17	4	...	...	...	...	80°	N.W.	N.N.E.	3	30·030	83°	80°	78°	Cum.	5	Cloudy.
„	8	...	...	...	...	81	N.W.	N.N.E.	4	30·034	83	80	78	Cum.-str.	7	Cloudy.
„	Noon	...	13° 10′	...	36° 58′	81	N.W.byW.	N. by E.	5	30·050	83	80	78	Cum.-str.	8	* Cloudy.
„	4	...	...	...	...	80	N.W.byW.	N. by E.	6	29·970	83	79	77	Nim.	8	Rain.
„	8	...	...	...	...	80	N.W.byW.	N. by E.	6	29·986	82	78	77	Nim.	10	† Heavy rain, lightning, and squalls.
„	Midt	...	...	...	...	79	S.W.	W.N.W.	8	29·870	80	75	75	Nim.	10	‡ Very Heavy rain, lightning, and squalls.
Aug. 18	2	...	...	...	...	...	... ...	... ...	10	29·680						
„	4	...	...	...	...	78	S.S.E.	S.W.	9	29·788	81	77	76	Nim.	10	§ Very Heavy rain, lightning, and squalls.
„	8	...	13° 32′	38° 48′	...	79	S.E.	S.S.W.	7	29·986	81	80	77	Cum.-str.	5	‖ Cloudy.
„	Noon	13° 41′	...	...	38° 56′	80	N.W. by N.	S.S.E.	5	30·026	83	80	77	Cum.	6	Cloudy.
„	4	...	...	...	...	80	N.W. ½ N.	S.S.E.	4	30·010	84	82	78	Cum.	6	Cloudy.
„	8	...	...	...	...	80	N.W. ½ N.	S.E.	3	30·050	84	79	77	Cum.-str.	5	Cloudy.
„	Midt	...	...	...	...	79	N.W. ½ N.	S.E.	3	30·088	83	79	77	Cir.-str.	4	Blue sky.

* Specific Gravity, 1·023.

† The gale increasing, lightning very vivid, raining in torrents.

‡ The gale increasing faster than the canvas can be secured making the vessel strain fearfully; the sea breaking on the starboard quarter.

§ About this time some fearful squalls almost hurricane-force. Water still very smooth, but lifting from the surface and keeping the decks full: wind veering all the time.

‖ A bank of stratus extending from south to east about 25° altitude, with an oily looking sky above it. Sea heaviest from the eastward. Specific Gravity, 1·023. Sea going down fast.

THE FRENCH AND GERMAN FLEETS IN THE LATE WAR.

THE first number of the new German publication entitled *Jahrbucher fur die Deutsche Armee und Marine*, the receipt of which we acknowledged last month, contains an article concerning the German fleet, regarded from an entirely German point of view. It is the only paper in the new journal bearing on maritime matters, by far the greater part of the publication being taken up with matters military. We can hardly be surprised at this, for the late successful war must obviously furnish the German people with endless topics for writing and talking about. It was the army which rendered such signal service to Germany in the late war, it was the army which crowned her with the laurels of success and effectually quieted a very troublesome neighbour; while the navy was doomed to a forced inactivity by reason of the overwhelming strength of the enemy.

The article is chiefly devoted to a review of three pamphlets which have recently appeared, one emanating from France and two from Germany. They are entitled respectively :—

1. La campagne de la mer du Nord et de la Baltique (8 articles du Moniteur Universel de Tours) par René de Pont-Jest.

2. Die Campagne von 1870 in der Nord und Ostsee (ans dem Franzosischen des René de Pont-Jest) Mit Berichtigungen and Zusatzen von einem Deutschen Seeofficier.

3. Unsere Flothe im Deutsch Franzosischen Kuege, von G. Livonius, Corvetten Capitain.

The first of these pamphlets appears to be an elaborate defence of the action of the French navy during the late campaign, and a sort of backhanded fling at the Germans for their want of courage in facing the French war-ships. The other two pamphlets retort that the cowardice was unmistakeably on the part of the French, and the writer in the *Jahrbucher* comments on the several statements and allegations in the three *brochures*.

It will be seen at once that the weight of the criticism is from the German side, and therefore the article is to a great extent *ex parte*. It may not, however, be uninteresting to our readers to learn what the Germans themselves thought of the comparative merits of the antagonistic naval forces and their doings, so we shall give a few extracts from the article in the *Jahrbucher*.

It seems that the *Moniteur Universel*, the organ of the French government, circulated the statement that the German fleet remained hidden high up the Jade, and that the French repeatedly, but in vain, challenged it to combat. With reference to this, the writer in the *Jahrbucher* hints that the object M. de Pont-Jest had in view in writing his pamphlet was simply that of apologising for the French fleet; and he goes on to say: "However strange it may appear, the second Maritime power in Europe displayed, for months, an utter absence of enterprize, and a complete want of military and naval tact, which astonished the world, and which induced it to shift the burden of its incapacity on to other shoulders, by colouring facts, and even intentionally misstating them. These are harsh words, but we advisedly bring these charges against the French navy, as it unscrupulously availed itself of every opportunity to accuse ours of *cowardice*."

"We read among the *remarks* of the second pamphlet that the German fleet did not hide itself high up the Jade, but remained at anchor in the outer estuary of that river.

"It would appear, therefore, that the French fleet had not even the courage of extending its reconnoitering far enough to ascertain the true position of ours."

"The author of the second pamphlet observes also very justly, 'What sense can there be in a challenge, offered by a force thrice as large as that which it calls to fight' (for that was about the relative strength of the two fleets). If an antagonist, so superior in strength, felt seriously disposed to fight, would he not forthwith throw himself upon his enemy and crush him? Our opponent, of whom England itself, not long since, went in fear, expected even that our small fleet would abandon its advantageously chosen position, and leave the choice of locality to him, the stronger of the two! Besides, it was an all-important duty of our fleet to protect the costly maritime establishment of Wilhelmshaven, works which had been fifteen years in construction, were yet unfinished, and would have been an easy prey to a few detached hostile ships, while their protectors were engaged outside in an unequal fight."

"When an insignificant fleet, like ours, compels a first-rate opponent, like the French fleet, to inactivity, and, by its well-chosen position, avoids an attack of a vastly superior force, it undoubtedly fully discharges its duty."

"It is further proved by the reports of the ships *Arminius* and *Kronprinz*, that the French absolutely shirked fighting, for they never thought of attacking the *Arminius*, although she was, on about forty occasions, within reach. We must also notice the affair before

Colberg. In article VII. we read, 'Had Admiral Bouet, when he appeared in sight of Colberg, been accompanied by the *Rochambeau*, he would, without fail, have made a serious demonstration against that town,' and, in the next page, we find, again with reference to Colberg, 'To hurl death into the midst of its defenceless population was not a feat suitable to the spirit of our brave sailors.' Admiral Bouet did, in fact, turn and sail away, thus giving M. Bismark a lesson in humanity, for which, later, he was to be rewarded by derision!"

"We now come to the third pamphlet, that of Captain Livonius, the publication of which is also due to the misrepresentations we have noticed, and also aims at the elucidation of facts in honest truthfulness."

"After having clearly proved that, on the part of the enemy, nothing whatever was undertaken against our positions, or even attempted, from which we might conclude that we were about to be attacked, Captain Livonius carefully compares the advantages and disadvantages of the respective fleets, and arrives, naturally, at the conclusion, 'that the French were in every respect immeasurably our superiors, but they did not know how to attack us.' He then depicts forcibly how this could effectually have been done, and puts the question, never answered yet by France, 'Why was nothing of the kind done? It is a fact,' says Captain Livonius, 'that, when an iron-clad frigate, accompanied by a swift corvette, ventured to within six or eight miles of Wangeroog, both ships were driven off and compelled to rejoin their fleet, by the *Kronprinz*, and again, when the *Arminius* attempted to come within range, they fled and were pursued by her as far as Heligoland'—Our admiral was forced to refrain from a general attack, by the consideration that, in case of defeat, our entire coast would be at the enemy's mercy, and our country exposed to incalculable injury."

"The pamphlet of Captain Livonius also contains a narrative of sundry fights, in which our navy displayed courage, endurance, and seamanship, which gave justifiable hope of future eminence."

These extracts we submit to our readers without comment. The article is spirited and well written, and shews that whatever may have been the facts of the case, the Germans know how to defend themselves against unpleasant accusations.

The new periodical seems likely to prove successful; it appears to be characterized by considerable vigour, and to be conducted by able and experienced hands.

THE MARINERS' COMPASS, AND BOARD OF TRADE EXAMINATIONS IN COMPASS DEVIATION.

THE origin of the mariners' compass is lost in obscurity; this much is certain, that it was either invented or very much improved by Flavio Gioja, of Naples, about the year 1302. It is however supposed that its use was known to the Chinese many centuries before that time, and that the famous traveller, Marco Polo, introduced it into Europe on his return from Carthage. Previous to the discovery of the properties of the magnet, mariners crept cautiously along shore, and dreaded to lose sight of land; but not long after it came into use they began to venture out to sea in search of new countries. In 1492, Columbus, directed by this infallible guide, found his way across an unknown ocean to the shores of the New World; while later on in 1498, the redoubtable Vasco de Gama weathered the "Cape of Storms," and opened out a new route to the golden coast of Malabar. Year after year, down to the time of Cook and Ross, new discoveries were made of unknown lands, until there was scarcely a square mile of sea that had not been sailed over by some adventurous navigator, in pursuit of science or of gain.

Up to the beginning of the present century, the compass needle was synonymous with faithfulness. Did a sighing lover wish to convey the idea of his constancy to his mistress, the needle and the pole were the images used. The sailor no more doubted his true friend the compass, than he did the usual rising and setting of the sun. In the darkest night and in the wildest storm, the needle pointed to the pole and directed the weary mariner to his desired haven. Captain Flinders, on his voyage to Australia in the year 1801, was the first to notice, intelligently, the deviation of the compass; but as its amount in wooden ships is usually very small, the subject, outside of scientific circles, attracted very little attention; but after the introduction of iron ship-building, it was found that the compass could no longer be relied upon. Instead of pointing to the north it sometimes pointed to the east, west, and south, and there was no certainty about its movements at all. It was bad enough in the northern hemisphere, but sailors who had crossed the equator declared that it was worse in the southern seas, as it sometimes remained for hours fixed at one point as if it had lost its mysterious power. One honest skipper—probably a better seaman than a navigator—sailing near the Cape of Good Hope, and pur-

suing the even tenor of his way with that implicit trust in the compass so characteristic of the British sailor, noticed that the sun appeared to be on the wrong side of the ship; to his amazement he found that instead of steering S.E. for Australia, his ship's head was looking to the west, in the direction of Cape Horn.

These vacillations of the compass were a serious check to iron ship-building. Underwriters were shy to insure iron ships except at enhanced premiums, consequently many attempts were made to discover some mode of correcting the compass. Barlow tried to do this by means of an iron plate placed near the compass, but it turned out a failure. At length the Astronomer Royal of England brought his great mathematical skill and practical sagacity to bear on the subject. After a great amount of time and labour devoted to the investigation, he discovered that the deviations of the compass, although most puzzling to the uninitiated, followed simple laws; and that by means of a system of compensation consisting of fixed magnets and soft iron, the compass in iron ships could be depended on as much as it is in wooden ones: but it was reserved for a sailor, the late Dr. Scoresby, to discover a beautiful law in connection with the magnetism of iron ships, which explains much that appeared to be obscure to the first investigators. This law is, that every iron ship is itself a magnet, and that the magnetic character of an iron vessel is impressed upon it by the inductive magnetism of the earth; the poles of the ship's magnetism depending upon the position of the building yard, and the direction of the keel while in course of construction. It would be out of place to detail all the advances that have been made in the knowledge of compass deviations; it will suffice to state that the theory is now so well known, and the practice has been so simplified by Mr. Towson, and by the Authors of the Admiralty Manual, that seamen of ordinary education and industry may easily acquire a sufficient knowledge so as to be able to compensate their own compasses. By means of a few algebraical co-efficients, an intelligent officer may not only record the performances of a compass, but he may also anticipate what changes are likely to occur by a change of latitude or position.

If we consider the immense amount of life and property now afloat on the seas in iron ships, we can appreciate the exertions the Board of Trade is making to establish examinations to test the knowledge of masters and mates in compass deviation. Last year voluntary examinations were established at Liverpool, and they were so successful that they have also been begun at the Tyne Ports. The Board of Trade have also directed that after the 1st of

January, 1872, all candidates presenting themselves for the grade of extra master, shall be examined in compass deviation. As a guarantee that the examinations will be properly conducted, the examiners themselves are first required to undergo a severe examination. The fee for the voluntary examination has been fixed at £2, but there is an impression amongst officers that many more candidates would be willing to present themselves for examination if the fee were less. The syllabus of the examination contains forty-seven questions, and a very slight inspection of these will be sufficient to show that candidates must have a good knowledge of magnetism to answer them satisfactorily. Although the questions in the syllabus are all of a practical nature, it is thought that a modified form of examination might be prepared for ordinary masters, such as the commanders and officers of coasting and short voyage steamers. Most of these men are thorough practical seamen, but many of them have had an indifferent education, and the arduous nature of their profession leaves but little time for self-improvement. It would be too much to expect that they could acquire the knowledge necessary to pass the extra master's examination, but they might be required to know as much of the subject as would enable them to guard against dangerous errors.

As regards compass adjusters, it is absolutely necessary that they should undergo an examination to test their competency. As a rule they are men who understand their work, but it is well known that there are some very incompetent men amongst them. It is impossible to overrate the importance of adjusters, and officers of iron ships possessing a sufficient knowledge of magnetism. It touches the interests of the underwriter, the shipowner, and the public. Every young officer who desires to rise in his profession should study the subject without delay, and he should not be satisfied by a mere superficial knowledge; in this as well as in all other subjects of study it is well to remember, that "a little learning is a dangerous thing." T. T.

[We were glad to notice, that at the last session of the Institution of Naval Architects, Mr. Thos. Brassey, M.P., read a paper on this subject, calling attention to the incompetency of many persons who profess to adjust ships' compasses, and strongly urging that the competency of persons undertaking this difficult and delicate work should be guaranteed by examinations conducted and certificates granted, by a council to be appointed for the purpose. We heartily coincide with our contributor, as to the desirability of masters and officers being required to shew that they are to some

extent acquainted with the theory and practice of compass deviation; it is a matter of the utmost importance. Ignorance on the subject has too often been productive of the most calamitous results, and when knowledge is really within easy reach of all who desire to become acquainted with the subject, it would seem as though it were almost a crime for those who have charge of ships to neglect this branch of nautical knowledge. The Board of Trade are doing good work in this direction, and we hope to see the requirements as to capacity in these and all other maritime qualifications enforced with judgment and firmness.—ED. *N.M.*]

THE WRECK REGISTER AND CHART FOR 1870.

In our issue for October we published a brief synopsis of the Wreck Register of the United Kingdom for the past year; but in now publishing the Wreck Chart for the same period we think the admirable remarks on the subject which recently appeared in the *Times* are very applicable, and we therefore take the liberty of reprinting them.

"The Wreck Register and Chart for 1870, reduce to figures and something like form the most precarious and uncertain part of our national heritage. We are a nation of sailors, living on dangerous shores, surrounded by stormy seas, and much at the mercy of winds and waves. How do we fare under these inevitable difficulties? One day with another there happen every twenty-four hours within ten miles of our own shores, in our narrow seas, our estuaries, and our shoal waters, a collision more or less serious, a total shipwreck, and two shipping disasters; altogether four serious casualties, involving, on the average, the daily loss of two lives. The average death of sailors is very much greater, for the above figures do not include those who are washed overboard, who fall from the rigging, are injured by falling spars, and the numerous other accidents of a perpetual war between man and the two elements least under human control. The daily average given above is considerably below the truth as regards shipwrecks and minor casualties according to the return for last year; and it so happens that the year 1870 was remarkably low compared with the average of the previous five years or the previous twenty years. There is a tide in the affairs of men, and the vicissitudes are fear-

fully striking and significant when we come to maritime affairs. The year 1870 was less disastrous than usual by a fourth. As, then, there certainly is such a thing as an average, and as we cannot flatter ourselves that so sudden an improvement was entirely or mainly owing to improved seamanship or shipbuilding, the inference is that the average has to be made up, that an excess this or the next year will make up for the deficiency of last. Again, there are days and weeks together when the winds are so light or so unchanging, the sky so clear, and the sea so slightly ruffled, that there ought to be no casualty at all, and, in fact, there seldom is. But all this time we are accumulating arrears which the sea will one day demand, and will pitilessly exact. The long score will be wiped off in a night, in an hour perhaps, by a sudden access of storm, or a sudden change in its direction. On an October night, such as that of 1859, you feel your strong built house staggering in the blast, and you tremble for windows, chimneys, and slates already rattling one on another. You listen for the crash of poplars or elm trees centuries old. You venture out, and as you feel your way you cannot see your outstretched hand. You are only conscious of waves of blacker darkness fast rolling overhead. You know, and cannot doubt, that at such a time the elements are doing three months' work all at once. No strength, no skill, no courage or hardihood, no tackle, no lighthouses, no life-boats, nothing that man can prepare or do, will avail to save the finest craft, be it powerful steamer or fine clipper ship, from total wreck if it be once near the shore or the bank and not under its shelter. Whole hecatombs of sailors, and passengers too, are swelling the reckoning. Such is the true meaning of four or five casualties, on the average, a day. We strike averages, but the sea observes no rule that man, at least, can divine. It refuses to be accountable. Its calms are proverbially treacherous, and an unwonted tenour of tranquillity ought to be more suggestive of alarm than one of seasonable tempests. One feels that we shall have to pay for the fact that in the two latter months of 1870 there was an almost entire absence of serious gales, and that on or near the Coasts of the United Kingdom there were only sixteen wrecks or other casualties which could be ascribed to the force of the wind.

"The object of such statistics, over and above that they are a necessity of business to underwriters and others who have to compute the chances of maritime adventure, is to find what man can do, how far these casualties are his fault, and what legislation can accomplish to prevent them. To begin with collisions, they always seem the fault of one crew or the other, and they often require a

judicial investigation to answer the question. Every collision let it be borne in mind, involves damage, if not entire loss, to two, sometimes even three or more, vessels. What can be done to prevent this? Of course the rules of the road have to be settled on good grounds, made clear, and enforced by legal decisions. The difficulty and danger consist, not in any uncertainty on this point, but in the fact that the conditions have to be apprehended, the decisions taken, the orders given and also executed in an exceedingly short space of time. It is a space of time to be measured by seconds, not minutes, for there seldom appears any necessity for giving orders at all till the ships are within a minute's distance. Any reasonable landsman crossing the Channel by night when there is a fair wind up or down, and, consequently, ships always in sight, will rather wonder how collisions are so generally avoided than how they happen.

"A ship is a very big and very complicated thing, and cannot be brought to obey the guiding intelligence quite so promptly as the human frame or a horse. There must often, too, be a little vacillation, and also a great liability to err in the degree of divergence necessary to avoid collisions. Nay, when the right thing has been done, a wave, or a gust of wind, may disappoint the calculation on one side or the other, involving both vessels in the result. There can, however, be little doubt as to the chief cause of this class of disaster, and it is one that can and ought to be prevented. The real culprit is generally an old or ill-built ship, a bad sailor, either heavily laden and deep sunk in the sea, or tossing about in ballast, ill-found, undermanned, and fit for nothing but to sail a straight course in an open sea, tacking very deliberately, if that should ever be necessary. A ship of this sort cannot get out of anybody's way in less than five minutes, even if its watch be awake and its lights as they ought to be. Shipowners and others claim a large latitude for the risks they choose to run, and they measure it by the loss they may themselves incur, but there are ships on the sea as dangerous to other ships as an ill-horsed and ill-driven cart or van in a crowded thoroughfare. In road questions the vehicle which is physically incapable of getting out of the way quickly enough is generally the one in fault. So it is at sea, and the law has to inform shipowners and others that if they do not care for their own ships, and their own crews and cargoes, they must be restrained from running a tilt through the sea, or lying like logs in the sea-way, through mere incapability of guidance. Though the total casualties of last year were no more than 1,502, which is considerably below the average, yet, as every collision involves two or more ships, they represent the loss or damage of 1,865 vessels, with a registered

tonnage of 404,000 tons, and peril of life to crews numbering 16,348 men and boys.

"Much the same is to be said of the causes to which the other casualties are to be referred, and if human rashness, cupidity, and folly are to be considered more manageable or more curable elements than the violence of sea or wind, then there is hope that the 'Wreck Register' will continue year by year to show less terrible results. But out of 411 total losses last year from other causes than collision, only 160 could be fairly referred to the wind, all the rest having been traced to defects in the ship, or her equipments, to inattention, carelessness, neglect, or other causes. Of the 730 minor, but still serious casualties, more than half are to be ascribed to the last-mentioned causes—viz., those for which man is entirely responsible. Excluding from the same total fishing vessels and such small craft, more than half the vessels lost or seriously damaged last year from all causes were those of the collier class, and such has been the proportion for six years. Of course many of these were old, but a large proportion were comparatively new, or not too old for this service. That colliers should figure so largely in maritime bills of mortality would not surprise anybody who has ever passed a fleet of them off the East coast, on his way between the Thames and a Northern port. It is evident that they are generally so ill-found and so underhanded that on a sudden change of wind most of them must be driven ashore, and once ashore must soon fall to pieces. 'As usual,' we read, the greatest number of wrecks occurred on the East coast, as will be seen from the following list:—East coast, 701; South coast, 148; West coast, 412; North and West coast of Scotland, 46; Irish coast, 163; Isle of Man, 18; Lundy Island, 6; and Scilly Islands, 8. The East coast is thus the most calamitous in fact, the West wind is by far the most destructive. It is consoling, and, indeed, a matter of much hope, that as many as 4,654 lives were saved last year; many hundreds of them by the Life-boats of the National Life-boat Institution, which has now 230 boats under its management. We are approaching the period of the year when this noble Institution will have fresh opportunities and trials, when it may be said its season begins. It relies on the public to enable it to continue its work of undoubted necessity and now of long-proved utility. It counts its successes by 800 lives a year, or 20,000 since it began its heroic operations."

THE LOSS OF H.M.S. MEGÆRA.

It is not without some satisfaction that we again have to allude to this casualty. The court-martial ordered for the trial of Captain Thrupp and the officers and crew of the *Megæra*, has terminated in a manner which must be gratifying to most people who have interested themselves in the matter. For ourselves, from the first, we expected nothing else than the acquittal of "the prisoners," and day by day our opinion was strengthened, as the details of the evidence reached us. The only question really at issue, as regards Captain Thrupp's conduct, was how far he was justified in beaching the ship; and the evidence as to her rotten and insecure condition was so conclusive, that doubt could not exist as to the wisdom of the prompt and energetic steps taken by him.

In some people's minds there is an impression that a court-martial, with all its disagreeable belongings so far as the accused were concerned, was not necessary in this instance; but we are not disposed to agree with this opinion. The rules of the service rendered the court-martial inevitable, and we believe that much more good has been done by it than harm. It is more than possible too, that Captain Thrupp and his officers would rather have gone through the ordeal to come out of it in triumph, and with no trace of blame brought home to them, than to have been untried and to have had an undefined suspicion of misconduct hanging over them. The result of the trial must be excessively gratifying to them, and must raise them in public estimation. The blame now is shewn to lie with those who sent out the vessel, and it is certainly a matter for congratulation that a negligent system which allows a most unseaworthy ship to go out on a long voyage, will be directly attacked, and let us hope be for ever abolished. Some serious defect must exist somewhere in official management when so monstrous a piece of carelessness is perpetrated, and we look forward in great hope to the enquiry to be made by the Royal Commission, and do not doubt that either judgment will fall on the negligent person or persons, or that a rotten system of supervision will be superseded by an efficient and intelligent reform. "It is an ill wind that blows nobody good," and the disaster to the *Megæra* may possibly be the means of clearing away a good deal of official mismanagement, in which case we shall rejoice that the accident took place.

Throughout the whole unfortunate business the conduct of Captain Thrupp and his officers stands out in admirable relief, and we cannot but feel that English coolness and presence of mind lives still amongst us, to make the best of such disastrous calamities as this affair of the *Megæra*.

Captain Thrupp in concluding his defence, said, "I wish to state on behalf of the officers and men who have returned with me, that I have always considered myself responsible for the steps I took in beaching the *Megæra*, and I feel it my duty to express my great satisfaction at the conduct of the whole of the officers and crew." No wonder that his men speak well of him. "You'll search the navy over, sir, before you'll find a better seaman or a truer officer," are the words of one of his crew, who further adds, "You should have heard him reading prayers that Sunday forenoon. There warn't a shake in his voice, no more than if he were going below presently for a glass of sherry, instead of having it on his mind to tell his ship's company that his ship might go down at any moment. He aint much a speaker; but his words got pretty nigh men's hearts that day. He told us how that 'the ship's bottom was literally dropping out,' and then bade us go in with a will like men and British sailors. We gave him three cheers, and then we went at it."

This little incident is very telling. It does not often happen to a man to be placed in a situation of the greatest emergency, but when it does arrive, the conduct of the man reveals his true character and lays bare his weakness or his strength. We confess to a great admiration of Captain Thrupp, and can readily picture him before the court-martial as described by a daily contemporary, as the "keen-eyed, ever-alert Captain of the *Megæra*, his face a standing note of interrogation. Cool, cautious, self-reliant, and prompt—that is about the notion you carry away of the man who is on his trial for 'causing the loss of' H.M.S. *Megæra*."

There is little more to be said on the subject at present; we are most gratified to be able to record the result of the court-martial, and we trust that the further investigation may bring forth good fruit.

The Royal Commission issued to the Right Hon. Lord Lawrence, the Right Hon. Abraham Brewster, late Lord Chancellor of Ireland; Admiral Sir Michael Seymour, G.C.B.; Sir Frederick Arrow, Deputy-Master of the Trinity House; Mr. Rothery, Registrar of the High Court of Admiralty; and Mr. Thomas Chapman, F.R.S., Chairman of the Committee for Lloyd's Register of British and Foreign Shipping, and a Vice-president of the

Institution of Naval Architects, directs them to inquire into and report upon the state and condition of Her Majesty's late ship *Megæra* when selected for her recent voyage to Australia; the circumstances under which she was despatched from this country; the extent and cause of the leak subsequently discovered in the ship, and of any other defects in the ship's hull at the time when she was beached at St. Paul's; also, as far as may be deemed expedient, the general official history of the ship previous to her said voyage, and her classification at successive dates.

The names of the distinguished men appointed on the Commission are a sufficient guarantee that every effort will be made to elicit the whole truth of the matter.

A SHORT SKETCH OF ZANZIBAR.

Just now Zanzibar is attracting a good deal of attention on account of its slave trade, and also because it is from thence we receive the only intelligence we get of the great African explorer, Dr. Livingstone. Knowing what very vague ideas I had with regard even to the position of Zanzibar, before visiting it, I venture to hope that a few notes made concerning it during a very short stay there, en route to India, may not be without interest.

The town of Zanzibar is built on the west coast of the island from which it takes its name. The island is about forty-two miles long by seventeen broad, prettily wooded with cocoa-nut palms, orange trees, clove, and other tropical plants. On approaching from the sea, the aspect of the town is rather imposing, a long front of white stone houses faces you, and on either side of these a number of mud huts are crowded irregularly together, and interspersed with cocoa-nut palms. The harbour presents a very busy and animated appearance, there are often as many as a hundred ships of various sizes; the Sultan's fleet (consisting I believe of five men-of-war) and several European merchant ships taking in their cargoes of ivory, copal, gum, cocoa-nut oil, cloves, and other productions of the island. The illusion with regard to the character of the town is soon destroyed, for no sooner did I set my foot on shore than I found it a very different place from what I had anticipated. The greater part of these imposing looking houses were semi-ruinous, unfurnished, wretched looking, and some

of them entirely deserted. On making enquiries, I was told that there are supposed to be as many of these houses in ruins as there are inhabited, and my informer explained, that this is the result of a superstitious belief, that if a man completed his house his death will speedily follow; so that some portion of every house is allowed to go to ruin: he also told me that houses are not unfrequently totally abandoned, under the impression that they are unlucky, specially if more than one death has occurred in them. The greater portion of the town consists of mud huts thatched with cocoa-nut leaves, and receiving light and air only through the door.

There are one or two main thoroughfares, which are tolerably wide, but most of the streets are very narrow and irregular, consisting of a number of shops where all kinds of goods are displayed. The owner sits outside the door on a seat of mud or stone and awaits customers. Judging from the number of people moving about in the town there appears to be a good deal of business transacted. Cattle are to be seen wandering or lying about in all parts of the town; they are of a very small kind, with long coats and humps upon their backs. Camels are also to be met with, but they are mostly shut up in large sheds, in which a couple of them may be seen, slowly pacing round and round, turning a mill for crushing cocoa-nuts to extract the oil; when their work is over they are turned out to graze on a sandy plain outside the town. Another curious feature of the town of Zanzibar is, that one comes across tombs scattered about in small groups in all sorts of corners where you might least expect to find them. There are one or two open spaces, the largest of which are the slave market and the chief market-place. The former I will describe later. The chief market-place is partially enclosed by an ugly wall; here large quantities of fruit and vegetables brought in from the country are daily sold. Mangoes, oranges, cocoa-nuts, bananas, sweet potatoes, the root of the casaoe (a kind of arrowroot), bread fruit, betel nuts, much used for chewing; pine apples, each in its season, may be seen piled up in immense profusion, and sold at wonderfully low prices. Splendid oranges and limes may be bought for sixpence and one shilling a hundred. The temperature is remarkably even, the thermometer stands at about 80° all the year round, and is never below 75° on the coldest day. The only strongly marked changes of seasons are the rains which occur twice a year at the change of monsoon. A strong breeze blows from N.W. from December to March, and from S.E. from June to October. The rains are followed by the cold season in June and July, but with the thermometer at 75° it can scarcely be termed cold.

I would now add a few words about the inhabitants of Zanzibar. I found it very difficult to obtain reliable information as to the amount of the population, but I should think it might be reckoned at about a hundred thousand, the number, however, is greatly augmented by the influx of Arab and Indian merchants, who come down with N.E. monsoon, and remain till S.E. monsoon sets in. The regular inhabitants consist chiefly of a people who have their origin from a mixed race of Arab and negro, called Swahili, there are also Arabs of various tribes, Mehans, negroes from the interior of Africa, people from Madagascar, Persians and Turks, and a few Europeans. Most of the offices of state or influence are held by Arabs, while trade is carried on almost entirely by Banyans, heathen Indians, who come to live for a time at Zanzibar for purposes of trade. The soldiers are Persians, and the slaves African negroes. The day seems to be chiefly spent in eating, sleeping, and strolling about the town. The costumes you see in the streets are very various. Arabs in their robes and turbans, the Swahili men and Banyans with nothing but a cloth suspended from the waist; Swahili servants with white gowns like an ordinary night dress with a white linen cap, and Swahili women with a dark blue coloured cloth fastened round them, covering the breast and falling down some distance below the knee. They perforate their ears, nose, and upper lip, and hang ornaments from them. You may see women with their ears stuck over with small splinters of wood, or a roll of paper inserted into the holes to keep the apertures open to receive ornaments on state occasions, and little children hung all over with bracelets, anklets, and ear-rings. The streets are too narrow for carriage or cart, so that all burdens have to be carried by slaves. Walking about the town you meet these fellows carrying loads of wood or ivory, and as they go along they give utterance to a curious groaning monotonous chant, repeating some sentence over and over again. The water in the town is very bad, and all drinking water is obtained from wells in the surrounding country; the women are the water carriers; they draw the water in the shells of cocoa-nuts, with a piece of rope fastened to them, and with them they fill large globular earthenware vases which they carry into the town, balanced on their heads.

Though all the Arabs go about armed, there are very rarely disturbances in the streets, and at night the town is perfectly quiet. I could not gather much information with regard to the administration of justice, as far as I could understand it, however, each tribe has its sheik or chief, and he decides all minor disputes and difficulties of the members of his tribe, but all important cases are

brought before the Sultan himself. Curiously enough, there still exists a Sultan of the Swahili people, besides the Arab Sultan, but his power is now very limited, and will probably soon cease to exist altogether. Having thus strung together the notes which I made during a few days' stay, I hope to be able at another time to send you a short account of the commerce, and more especially the slave trade.

THE OPEN POLAR SEA.

THE Geographical and Statistical Society at Frankfort has forwarded to us the copy of a report from First Lieutenant Julius Payer, of the *Harold Harfagr*, on the subject of his recent expedition, briefly alluded to in our last number. The following is the substance of Lieutenant Payer's remarks:—"The preliminary expedition for the discovery of the sea between Spitzbergen and Nova Zembla, which is to be followed next year by a greater undertaking, has had an unexpected issue—the discovery of an extensive open Polar Sea in the place of a region which was held to be wholly unnavigable, into which the Russians, the Swedes, and also the German expedition of 1868 strove in vain to penetrate. This result is calculated to give another direction to the whole Polar question, and afford a new and highly promising basis for the discovery of the Pole. It is much to be regretted that the great German North Polar Expedition of the year 1869-70 did not take this way through the 'Nova Zembla Sea,' which was originally acknowledged by Dr. Petermann to be the best route for reaching the heart of the Polar basin. While important authorities up to our own times have declared themselves decidedly against every route eastward of Spitzbergen; while the various Russian expeditions in the present century have not once succeeded in sailing round the north of Nova Zembla; and the voyage during the past year of the Norwegian Jansen close along the coast of this peninsula, out of the Sea of Kara into the Behring Sea, was regarded as an extraordinary occurrence, the reality of which was doubted in many quarters, our experience has demonstrated the existence of an extensive open sea north of Nova Zembla. As, however, the Sea of Kara has been observed to be clear of ice, the connection between the open Sea of Nova Zembla with the

Polynia in the north of Siberia during the autumn is as good as demonstrated. An immense glacial territory thus disappears from our maps. People will not fail to represent the year 1871 as an unusually favourable one for ice-navigation, just as they have as often spoken without proof of 'unusually unfavourable' years. In the whole of Norway, however, the walrus hunters and fishermen are unanimous in declaring that the past summer must be counted among the worst they have had for a long time. Even the German exploring vessel *Germania* could not succeed in entering the Sea of Kara. We attained the 79th degree of north latitude without any difficulty, and nothing but scarcity of provisions hindered us from pressing further northward. The most probable reason of the wonderfully favourable condition of the ice in the Nova Zembla Sea during the autumn, appears to be the Gulf Stream. This theory cannot be positively affirmed yet, but only accepted as probable. In support of this theory may, however, be adduced the difference of temperature, amounting to from three to five degrees between that of the water in these high latitudes (in September), and that of the air, the frequency of fogs, the appearance of skies peculiar to the trade winds, the ascertained current towards the north-east on the coast of Nova Zembla, the ultramarine blue of the water (the characteristic colour of the Gulf Stream), and the extraordinary wealth of animal life in the sea."

YACHTING.

Mr. Ashbury has returned to England without the cup that was won by the yacht *America* in English waters twenty years ago. If the owner of the *Livonia* had taken out a yacht as swift as the Scotch express, and as defiant of foul weather as Vanderdecken's phantom ship, the Yankees would have "done" him. They are better hands at making a match than he, for the simple if Irish reason that they do not make matches at all, but "arrangements," whereby it is probable that the chances are in their favour. It is to be hoped that we have heard the last of Anglo-American yachting for some time to come. The piece of plate which was carried off by an ugly racing machine in 1851, would seem to be regarded

at the other side of the Atlantic in the light of a priceless tribute to America's nautical greatness. Let nautical America keep the gew-gaw, and much good may it do her.

In the fulness of time, when Mr. Ashbury shall have been gathered to his fathers, there will surely arise other Quixotes of the sea, who will chivalrously essay the recovery of the *America's* cup, and who will not succeed in their quest. It will be unwise and cruel to blame them. Let them be dealt gently with, even as one would now deal with their forerunner. He thought to find the manners of "the Wight" and the customs of his beloved Harwich over at Sandy Hook, and he was disappointed. He likewise laboured under another delusion which it might be wholesome for him to put away at once and for ever. The "passionate" pilgrimage in search of the *America's* cup never was a British affair at all. It was Mr. Ashbury's expedition *pur et simple*. Had he succeeded in obtaining the trophy, there would have been several dinners given, some wine consumed, and much vapour in the shape of absurd speeches disseminated. Brighton especially would have toasted Mr. Ashbury, and Mr. Ashbury would have returned the compliment. Possibly Mr. Ashbury would have been presented at Court, Master M'Grath, the Irish greyhound that won the Waterloo Cup, was.

But when all was said and done, his victory would not have been regarded as a national affair either by his brother yachtsmen or the phlegmatic inhabitants of these unsympathetic isles. The *Livonia* herself was confessedly a failure. When was England represented in any International contest by a second or third rate champion—one that was known to be such? It was not flattering to the pride of the Yankees to send such a yacht to try conclusions with the flower of their fleet. We are, of course, speaking of the *Livonia* that went to America, not the schooner of that name after Ratsey has made a further attempt to remedy her defects. No; "the gentlemen of the press" on both sides of the Atlantic may affect to believe that the inglorious expedition which was commenced by the Commodore of the Harwich Club was essentially a great—a national—affair, but it was nothing of the sort. When it pleases the English yachting world to hanker after that remarkable piece of plate which is now in the possession of the New York Club, measures will be adopted to bring about a contest there for very different from those which distinguished Mr. Ashbury's negotiations; and, it may be presumed, a yacht sent out laden with the united *confidences* of English yachtsmen, not a vessel full—so to speak—of their *doubts*.

But under the "cute" conditions* imposed by the holders of the cup, it was absurd to look for the success of the English schooner. We have never upheld the owner of the *Livonia* in his extravagant claims. For example, we consider the New York Club had reason on their side when they repudiated his demand, on the strength of holding twelve certificates from recognised English clubs, to sail that number of matches against one representative yacht, and that not a centre-boarder. The demand was ridiculous, but while this was so, the shape assumed by the answer thereto crushed out of the contest all the trifling element of chance it had contained. We waive the centre-board question, and think Mr. Ashbury ought to have conceded it as the Harvard crew did that of a coxswain when they rowed the English four on the Thames. He objected to the New York Yacht Club course, and quite properly, we think, on the obvious ground that a familiar knowledge thereof, which it was reasonable to suppose the Americans possessed, would be points in their favour. When the American sculler, James Hammill, came to England "to lick creation"—and Harry Kelley—he made a similar objection. He refused to row on the Thames, and with commendable courtesy, Kelley gave way, and soundly thrashed the Pittsburg wonder—on the Tyne. But American sportsmen never take a leaf out of an Englishman's book, unless it chances to suit theirs. Mr. Ashbury's amusing request to be multiplied by twelve was first of all set at naught, then his perfectly fair and reasonable desire for a more open and less "local" course than that of the club for all the matches; and finally, driven into a corner, he was compelled to accept these marvellously "cute" conditions insisted on by Messrs. Moses Grinnell, Shepherd, Gandy, R. S. Howe, and Philip Schuyler, or return to England without having had a try for the cup.

* "The victory of the *Columbia* was confidently anticipated, and an equal confidence is felt everywhere, except possibly in the bosom of Mr. Ashbury, in the success of the American yachts in the remaining races. The American public ought to feel thoroughly proud of its yachtsmen, who have exhibited all the proverbial national shrewdness in managing the contest with Mr. Ashbury. The right reserved by them to name the vessel which is to contend with the *Livonia* on the morning of the day of each race enables them to select a centre-board or a keel boat, a light-wind or a heavy-wind yacht, according to the exigencies of the occasion. By their astuteness they may be fairly said to have organised victory, and to have made the defeat of the *Livonia* in a majority, if not in all the races, a matter of certainty. While every one will sympathise with that gallant captain in his defeat, nevertheless the entirely patriotic American must feel proud of the superior shrewdness of his countrymen who have supplemented the speed of their yachts by their astute arrangement of the conditions of the contest."—*New York World.*

Those conditions we have no hesitation in pronouncing essentially unfair. Mr. Ashbury was held to represent but one club and yet he was compelled to sail five matches against four different yachts, which were to be selected on the morning of each contest, according to wind, weather, and course. It was like asking an "all round" *athlete*, with one strong point about him, to contend in five matches against four antagonists—"one down and another come on"—confessedly superior to him in all save the point mentioned. Like asking a horse which could trot in a superior manner, to prove its supremacy in that particular, and then gallop faster than fleetest of tried flyers in a scurry race, stay longer than the stoutest horse that ever ran the Beacon course, and get home under a heavy weight over a cruel line of country in front of the winner of the Grand National Steeple Chase. For what was intended by the selection of yachts of essentially different capabilities, their thoughtful adaptation to the state of the wind and the peculiarities of a course, but—to borrow an illustration from our national sport—heavily handicapping the "stranger" against which these four "natives" have to contend? The special arrangements for the matches rendered the chances of the *Livonia* emerging from the struggle remote enough, and it happened, too, that the complicated code of measurement in vogue in America placed her prospect of success very far off indeed.

Mr. D. Kemp, the special correspondent of the *Field* demonstrates this forcibly enough. The measurement approximated to displacement, and is as follows: "The areas of three sections from the water line to the intersection of outer planking with keel, one taken amidships, another taken equi-distant therefrom to the stem, and the third equi-distant therefrom to the stern, shall be measured and determined in square feet. The cubical contents of the immersion shall then be calculated by multiplying the sum of the areas of the three sections by one-fourth of the length on the water line in feet and decimals, which shall for the purposes of this measurement be deemed the displacement of the yacht. The cube roots of the displacements shall be deemed the bases of comparative allowance of time. In order to apply the bases of measurement as above to the sliding scale of allowances, graduated according to the time of making the race (but for no other purpose), the cube roots of the displacements shall in all cases be multiplied by 100, and thus form the apportionments for the tables. By this rule (says Mr. Kemp) the apportionment of the *Sappho* comes out as 1951; *Dauntless*, 1924; *Livonia*, 1881; *Columbia*, 1694; and *Palmer*, 1659. For a race of forty statute miles, lasting five and a quarter hours, the amount of time for a vessel to allow for each unit of apportionment is *Sappho* and

Dauntless 0·90 sec., *Livonia* 0·92 sec., and *Columbia* and *Palmer* 0·96 sec. The rule by which the allowance one yacht has to allow another is found by subtracting 1500 from her apportionment, and multiplying the remainder by the allowance of seconds or decimal fractions of a second, and adding the allowance thus found to her actual time. Thus the *Sappho* would allow the *Livonia* for a five and a quarter hours' race 55 sec., and the *Dauntless* 31 sec.; the *Livonia* would allow the *Columbia* 2 min. 44 sec., and the *Palmer* 3 min. 18 sec. Such allowance is no doubt ridiculously small, and tells dreadfully against the *Livonia*, as her displacement is considerably larger than that of most American yachts of equal proportionate beam and length. By the measurement of superficial area used by the New York Yacht club last year, the *Livonia* would get nearly ten minutes of time from the *Sappho*, and would have to allow the *Columbia* and *Palmer* a few seconds only; by English yacht club measurement, and an allowance of 5 sec. per ton, the time to be allowed would be very near to that allowed under the rule of the New York Yacht Club in 1870."

The first match was sailed with Mr. Franklin Osgood's *Columbia* over the Club course on the 16th October, when to make a long story short, the American yacht led from start to finish. The *Livonia* had to allow the *Columbia* 2min. 44sec., and so the latter actually won by 28min. 2sec. The actual time of making the race was—*Columbia*, 6h. 17min. 42sec.; *Livonia*, 6h. 43min. The wind was light and paltry. Mr. Kemp says, with reference to this match, "that of the several yachts under way—including the *Sappho*, *Madeline*, *Magic*, *Tarolinta*, and *Madgie*—not one of them held her own with the *Livonia*, and she ran right away from the *Sappho*, the latter going through the Swash Channel for the Lightship, and not round the S.W. Spit Buoy." That sort of preternatural shrewdness which in this benighted land we are wont to attribute to a Philadelphian lawyer, prevailed at the deliberations of the N.Y.C. Committee on the eve—or rather morning—of the second match. But the committee nearly over reached themselves, and would have done so but for a brilliant stroke of cunning—or shall we call it genius?—which saved them at the eleventh hour. The match was arranged to be sailed outside Sandy Hook Lightship, twenty miles to windward and back, and it was expected by Mr. Ashbury that either the *Palmer* or the *Dauntless* would do battle with the *Livonia*. When the breeze became light, and there was a prospect of its faltering still more, the committee decided upon once again having recourse to the *Columbia*. The wind was W.N.W., and the course was either to be dead to windward or dead to leeward, and the latter was chosen. But let us again quote Mr.

Kemp: "To have given the course E.S.E. would have been simple enough; but the sapient committee men attempted to surpass all the achievements of those who have spoken prophetically of meteorological events. The breeze was soft and bland, and it occurred to the committee that it would ere long southern; in this opinion they were supported by several sympathising experts, and so the committee gave the course E.N.E. But the wind persisted in northerning, and before the yachts could be started, a fine reaching topsail breeze was blowing from N.W. by W. The pilots and sea captains were humbled, the committee were confounded, and plainly saw that they had made two mistakes—one in not allowing the *Dauntless* to start, and the other in attempting to do more than is within the range of (even American) human ken.

"But the committee, unknown to themselves, had perhaps taken effectual means to secure victory, even though the *Livonia* could 'reach' faster than the *Columbia* in a fresh breeze. When the owner of the latter vessel received instructions to go, he inquired how the stakeboat at the end of the twenty miles was to be rounded; the committee, with a blameable recklessness, replied, 'You can round the steamer whichever way you please.' Now the printed instructions given to the *Livonia* for the first race were that the Sandy Hook Lightship should be rounded by the northward and eastward, or, in other words, on the starboard hand; and, as it was known that all turning buoys or stakeboats are so rounded here, the inference was that there would be no change in this instance. No intimation was made to Mr. Ashbury that the rounding would be different or optional, and the *Livonia* rounded the mark, as on the day before, on the starboard hand. To do this she had, in reaching out, to keep to windward of the mark, gybe over, and, making a long sweep, come out to leeward of it. The *Columbia* was a good two minutes astern, and, keeping to leeward of the mark, luffed round, came out to windward, and finally tacked a half mile on the *Livonia's* weather quarter. By these tactics—described by some of the New York papers as peculiarly American in smartness, and decidedly superior in point of seamanship to the correct sailing of the Britisher—the *Columbia* gained an advantage, estimated by an independent witness and good judge of such matters, who was sailing in the *Columbia*, of five minutes over the *Livonia*. The effect of the trick was to practically lose the *Livonia* the match, for at the finish, with time allowance thrown in, the *Columbia* had won by 10min, 34sec. only." The third match was "rats" to the Yankees from first to last. Every possible expedient in the shape of excuse was exhausted in order to prevent the

Dauntless starting (Commodore Bennett did not fancy it); and when, rather than the race should go to Mr. Ashbury by default, the *Columbia* re-entered the lists, she met the fate which, bar accident, would have been hers on the previous day. The *Livonia* won by 15min. 10sec., making the fastest time on record over this course. We have already dwelt at too great a length on the various matches, and so must hasten to remark that the *Sappho* was next "drawn" against the *Livonia* and beat her by 30min. 21sec.—in a second contest by 25min. 27sec. In a final contest with the *Dauntless*, she was beaten by 4min. 40sec. Another match had been arranged with the *Dauntless* and one with the *Dreadnought*, but these were declared "off," and Mr. Ashbury returned to England. We understand the *Livonia* is to be subjected to a thorough overhauling and an important alteration, which it is hoped will add considerably to her speed. Next season she may have an opportunity of meeting her old antagonists in English waters, as the leading American yachtsmen have announced their intention of visiting England with their yachts.

Ratsey is about to build a new 140 ton yawl for Mr. Richardson, who formerly owned the *Zelia*. She will be on the same model as the Earl of Strafford's well known *Lufra*, which was also built by Ratsey; this makes five yachts he has in hand this winter. The new yacht for Count Batthyany has all her timbers up and ready to commence planking. She is a fine, powerful cutter of 105 tons.

White, of the Medina Docks, is about to build a schooner of 120 tons for Mr. J. D. Lee, commodore of the New Thames Yacht Club.

The Marquis of Breadalbane has purchased the *Stella* of Seath, the builder at Glasgow, who is now building a new steam yacht for the Marquis of Conyngham.

HEALTH OF THE NAVY.

From the Statistical Report of the Health of the Navy for 1869, recently published, we gather some most interesting and valuable information as to the general sanitary condition of the Fleet at the various stations, and of the naval hospitals, marine divisions, and dockyards; also as to the allocation of particular diseases in certain parts of the world and in certain ships. The report is

compiled by Deputy Inspector-General Dr. Mackay; it extends to 600 pages, and is most comprehensive. We hope to take up the subject of the distribution of different diseases at another time; it is a subject full of importance and opens a wide field for enquiry; but for the present we shall confine ourselves to furnishing our readers with the statistics concerning the sickness and rate of mortality in our Fleet, as shewn in the Report.

The Nore, Portsmouth, Plymouth, Queenstown, and the Channel Fleet.—The mean force corrected for time was 12,100, and the total number of cases of disease and injury entered on the sick-list 19,892, which is in the ratio of 900· per 1000 of force, being an increase, compared with the preceding year, equal to 8· per 1000. Of these 566 were invalided, and 153 died, the former being in the ratio of 25·6 and the latter of 6·9 per 1000. Compared with the preceding year there was an increase in the invaliding rate to the extent of 3·7 per 1000, and a reduction in the ratio of mortality of ·6 per 1000. The average number of men daily sick was 846·7, which is in the ratio of 38·3 per 1000 of force, being an increase, compared with the preceding year, equal to ·6 per 1000.

The Mediterranean Station.—The mean force, corrected for time, was 3970, and the total number of cases of disease and injury entered on the sick-list 5669, which is in the ratio of 1427·9 per 1000, being an increase, compared with the preceding year, equal to 64·8 per 1000. Of these 157 were invalided, and 32 died, the former being in the ratio of 39·5 and the latter of 8· per 1000. Compared with the preceding year there was an increase in the invaliding rate to the extent of 12·7 per 1000, but the ratio of mortality was lower by ·7 per 1000. The average number of men daily on the sick-list was 210·8, which is in the ratio of 53· per 1000, being an increase, compared with the preceding year, equal to 1·7 per 1000.

The North American and West Indian Station.—The mean force corrected for time was 3500, and the total number of cases of disease and injury entered on the sick-list 5210, which is in the ratio of 1488·5 per 1000 of force, being an increase, compared with the preceding year, equal to 62·2 per 1000. Of these 120 were invalided, and 82 proved fatal, the former being in the ratio of 34·2, and the latter of 23·4 per 1000. Compared with the previous year there was a reduction to the extent of 4·6 per 1000 in the invaliding rate; but an increase in the ratio of mortality equal to 14·2 per 1000, an increase altogether attributable to the prevalence of yellow fever at Jamaica and elsewhere. The average number of men sick daily was 180·7, which is in the ratio of 51·6 per 1000,

being a reduction, compared with the preceding year, equal to 5·4 per 1000.

The South-East Coast of America.—The mean force corrected for time was 930, and the total number of cases of disease and injury entered on the sick-list 1402, which is in the ratio of 1507·5 per 1000, being a decrease compared with the preceding year equal to 11·9 per 1000. Of these 19 were invalided, and 20 died, the former being in the ratio of 20·4, and the latter of 21·5 per 1000. The invaliding rate is almost precisely the same as that of the previous twelve months, but there is an increase in the death-rate to the extent of 6· per 1000. The average number of men sick daily was 41, which is in the ratio of 44· per 1000 of force, being a reduction, compared with the preceding year, equal to 8·1 per 1000.

The West Coast of Africa Station.—The mean force corrected for time was 1730, and the total number of cases of disease and injury entered on the sick-list 2795, which is in the ratio of 1615·6 per 1000 of force, being a reduction, compared with the preceding year, equal to 248·1 per 1000. Of these 112 were invalided, and 18 proved fatal, the former being in the ratio of 64·7, and the latter of 10·4 per 1000. Compared with the preceding year, there was a reduction in the invaliding rate to the extent of 19·5, and in the ratio of mortality of 2·6 per 1000. The average number of men daily sick was 98·8, which is in the ratio of 57·1 per 1000, which is a fractional increase compared with the preceding year.

The Pacific Station.—The mean force corrected for time was 2330, and the total number of cases entered on the sick-list 3391, which is in the ratio of 1455·3 per 1000 of force, being a reduction, compared with the preceding year, equal to 199·1 per 1000. Of these 59 were invalided, and 30 died; the former being in the ratio of 25·3, and the latter of 12·8 per 1000. Compared with the year 1868, there was a reduction in the invaliding rate to the extent of 12·2 per 1000, but the ratio of mortality was higher by 4·8 per 1000. The average number of men sick daily was 135·8, which is in the ratio of 58·2 per 1000 of force, being a reduction, compared with the preceding year, equal to 5·2 per 1000.

The East India Station.—The mean force corrected for time was 2300, and the total number of cases of disease and injury entered on the sick-list 4277, which is in the ratio of 1859·5 per 1000, being a decrease compared with the preceding year equal to 218·8 per 1000. Of these 129 were invalided, and 31 died, the former being in the ratio of 56·0, and the latter of 13·4 per 1000.

Compared with the preceding year, there was a decrease in the invaliding rate to the extent of 21·7, but an increase in the ratio of mortality equal to 1·6 per 1000. During the preceding year the ratio of cases entered on the sick-list, and of invaliding, were exceptionally high, owing to the exposure of the crews of the vessels employed in the Red Sea in connection with the Abyssinian Expedition. The total average number of men sick daily was 119·7, which is in the ratio of 52· per 1000, being a reduction, compared with the preceding year, equal to 13·9 per 1000.

The China Station.—The total force corrected for time was 3750; but in estimating the ratio of cases entered on the sick-list it is necessary to make a deduction from the force equal to the crews of the small gunboats, from which the returns were defective, and for this purpose, therefore, the force will be considered as 3480; the total force, however, is taken for the invaliding and death rates, the returns under those heads being complete. The total number of cases of disease and injury entered on the sick-list was 5242, which is in the ratio of 1506·3 per 1000 of force, being a reduction, compared with the preceding year, equal to 86· per 1000. Of these 188 were invalided, and fifty-one proved fatal, the former being in the ratio of 50·1, and the latter of 13·6 per 1000. Compared with 1868, there was a reduction in the invaliding rate to the extent of 15· per 1000, and an increase in the ratio of mortality equal to ·6 per 1000. The average number of men sick daily was 231·4, which is in the ratio of 61·7 per 1000 of force, being an increase, compared with the preceding year, equal to 3·8 per 1000.

The Australian Station.—The mean force corrected for time was 760, and the total number of cases of disease and injury entered on the sick-list 1425, which is in the ratio of 1875· per 1000 of force, being an increase, compared with the preceding year, equal to 291·8 per 1000. Of these 25 were invalided and 7 proved fatal, the ratio of the former being 32·8 and the latter 9·2 per 1000. Compared with the previous year there was an increase in the invaliding rate to the extent of 2·4 per 1000, but there was a reduction in the ratio of mortality equal to ·4 per 1000. The average number of men sick daily was 42·5, which is in the ratio of 55·9 per 1000, being an increase, compared with the previous year, equal to 4·3 per 1000.

In the Irregular Force.—The mean force corrected for time was 7450, and the total number of cases of disease and injury entered on the sick-list 10,024, which is in the ratio of 1345·5 per 1000 of force, being an increase, compared with the preceding year,

but only to the extent of 3·9 per 1000; of these 199 were invalided and 60 proved fatal, the former being in the ratio of 26·7, and the latter of 8· per 1000. Compared with 1868 there was an increase in the invaliding rate to the extent of 3·6, and in the death rate of ·5 per 1000. The average number of men sick daily was 348·6, which is in the ratio of 46·7 per 1000 of force, being a decrease, compared with the preceding year, equal to 8·6 per 1000.

SOCIETIES.

MEETINGS, ETC.

ROYAL GEOGRAPHICAL SOCIETY.—Session 1871-2. November 13th, Major-General Sir H. C. Rawlinson, K.C.B., President, in the chair.

The President, on opening the Session, delivered an address, in which, after paying an eloquent tribute to the worth of the late President, Sir Roderick Murchison, and expressing his sense of the loss which the Society had sustained in his death, he reviewed the progress of geography since the last meeting of the previous Session. He congratulated the fellows on being again permitted to meet in the handsome and commodious Hall of the London University; and stated that the Council felt that the Senate of that body, in granting the use of the Hall, conferred an obligation not only on the Society but on the public at large, whose instruction and education in geography formed the especial objects of their study. He also announced that the Society had, during the recess, taken up its permanent quarters in Savile Row, where it was now located on its own freehold estate. In Physical Geography, the important subject of Oceanic Circulation, and Dr. Carpenter's researches thereupon, was prominently noticed; and he stated that Dr. Carpenter, during his Mediterranean voyage of the past summer, had met the objections of his critics, in so far as related to the under-current outwards at the Straits of Gibraltar, by experimentally proving that such a current really does exist. In Arctic exploration the recent German expeditions were noticed, particularly the voyage of Messrs. Payer and Weyprecht, who, last summer, had found an open sea, in lat. 79°, between Spitzbergen

and Nova Zembla. In Central Asia and Eastern Persia much accurate information had recently been obtained by English travellers and surveyors; and in Syria their medallist, Captain Burton, had recently, in company with Mr. Drake, examined the Anti-Libanus and the little known district east of Damascus,—subjects on which this indefatigable traveller would read papers at a subsequent meeting. An excellent descriptive paper had been received from the well-known and able traveller Captain Blakiston on the subject of the Island of Yezo, the circuit of which he had recently explored in the capacity of an official of the Japanese government. No direct news had been recently received either from Dr. Livingstone or Sir Samuel Baker; but authentic intelligence of Livingstone could not be much further delayed, as an able and adventurous American gentleman, Mr. Stanley, left Zanzibar for the shores of Lake Tanganyika, in February last, taking with him "Bombay," one of Speke and Grant's "faithfuls," as guide. He (the President) added that if Mr. Stanley succeeded in restoring Livingstone to us, or in assisting him to solve the great problem of the upper drainage into the Nile or Congo, he would be welcomed by the Society as heartily and warmly as if he were acting under their own immediate auspices.

A paper was then read on "The Exploration of the Limpopo River," by Captain Frederic Elton. This remarkable journey was performed between July 6th and August 8th, 1870, the author starting from the Tati gold-fields and proceeding by an easterly route to the junction of the Tuli River with the Limpopo, and thence descending the great stream or marching along its banks to beyond the junction of the Lipalule, whence he struck across to Lorenço Marques, in Delagoa Bay. The middle part of the Limpopo, between the Tuli and Lipalule, was found to be encumbered with rapids and waterfalls, some of which, especially the cataracts called Tolo-Azime, were truly magnificent, the river, after a series of rapids five miles in length, here plunging over a ledge into a deep chasm. These falls mark the spot where the Limpopo leaves the great interior plateau of Africa and descends abruptly into the plains which extend henceforth to the sea. The paper described the country traversed as rich and abundant in game of all descriptions.

Institution of Naval Architects.—We beg to draw the attention of our readers to the following list of subjects, which the Council of the Institution of Naval Architects desire to submit to the Members and Associates of the Institution, and others interested in

shipbuilding, as questions on which they will be glad to receive communications for the Annual General Meeting in March (20th to 23rd), 1872.

It is requested that all such communications may be forwarded to the Secretary of the Institution not later than the 20th February, 1872.

In naming these subjects, it is by no means the intention of the Council to restrict gentlemen desirous of reading papers on other matters, nor is it intended that the list should be an exhaustive one.

Subjects for Papers.—1. The construction of vessels for coast defence.

2. The effect on naval construction of torpedoes, or other modes of submarine attack.

3. On the results of the best modern practice in ocean steam navigation, with reference to the latest modern improvements—such as surface condensation, super-heating, compound engines, and the like; also the value of each of these taken separately, and especially the results of any actual experiments to test this point.

4. On the friction developed in marine steam engines of different forms; and on the difference between the *gross* indicated horse-power developed in the cylinder, and the *net* effective horse-power available for the propulsion of the ship after working the air-pump, slide-valves, and other moving parts of the engines.

5. On economy of fuel in marine engines, with detailed results.

6. On marine boilers, their form, rate of combustion, and the proportion of their various parts.

7. Information as to the alleged rapid deterioration of marine boilers supplied with water from surface condensers and the remedies for the same.

8. On methods for starting, stopping, and reversing marine steam engines of high power.

9. On the life and cost of maintenance of merchant steam-ships.

10. The design and construction of yachts.

11. On the time allowances of yachts.

12. On legislative interference with the construction, stowage, and equipment of ships.

13. The effect upon shipbuilding of Lloyd's rules, the Liverpool rules, and the rules of other similar societies for the classification of ships; and on ships not classed.

14. On methods for the proper strengthening of ships of extreme proportions, and on the precautions necessary to ensure their safety at sea.

15. On the present state of knowledge of the strength of materials as applied to shipbuilding, with especial reference to the use of steel.

16. On the masting of ships, and on iron and steel masts and yards.

17. On the disposition and construction of bulkheads, and on their attachment to the sides of iron ships.

18. On machines for the economising of labour in the construction of ships.

19. On the use of machinery for economising labour on board ship, whether merchant ships or ships of war, and whether for loading or manœuvring.

20. On the best method of clearing vessels of water in the event of a leak, and on any novel form of ship's pump.

21. On the means of accurately measuring the speed of ships.

22. On instruments for measuring and recording the rolling of ships, both as to time, and extent of roll.

23. On the measure and amount of resistance opposed to a ship's progress by the water through which it moves.

24. Exact information (either experimental or theoretical) on the efficiency of propellers.

25. On the ventilation of ships by natural and forced draughts, with details of any system in actual operation.

26. Exact information, derived from experience, on the steering of ships fitted with balanced rudders.

27. On methods of steering ships which have been deprived of their rudders.

28. On telegraphic or other communication of orders on board ship.

29. On floating structures for special purposes—such as docks, lighters, tank vessels, light ships, telegraph ships, and others.

30. On the economic value of form and proportion both in merchant vessels and in ships of war.

NOTICES OF BOOKS.

Papers on Maritime Legislation, etc. Second Edition. By Ernst Emil Wendt. London. Longmans. 1871.

Mr. Wendt is well known in shipping circles as a gentleman of considerable activity and influence, and his opinions on maritime

matters may well be supposed to be of some weight. His book now before us has served a most useful purpose as a work of reference, and his clear statement of the shortcomings of the law on certain points has been of some service in influencing attempted legislation.

Maritime legislation has made but sorry progress of late years, but such well intentioned publications as this of Mr. Wendt's, will not fail to assist in the formation of right judgments when the time does arrive for the adjustment of the many anomalies which now fetter the operation of maritime law. We do not say that we agree with Mr. Wendt in all that he has written, indeed in some cases, especially that of pilotage, we think very differently from him. We do not however propose now to enter upon the questions which have so often been discussed, and are so well known among those interested in maritime matters; but we desire to express an opinion, that when an intelligent gentleman like Mr. Wendt brings his experience and enlightenment to bear on such an important matter as maritime legislation, his views are very worthy of consideration, and his book is a valuable contribution to the literature of a subject which requires as much ventilation as it is possible to ensure for it.

We also appreciate the higher motive which Mr. Wendt implies has actuated him in his work, viz.: "to add," as the Prince Consort has expressed it to be the duty of every educated person, "his humble mite of individual exertion to further the accomplishment of what he believes Providence to have ordained," and this object is "the realisation of the unity of mankind." However Utopian this object may seem to be, we must admire any man who sets such a purpose before his eyes and in his life's work is influenced and encouraged by a desire to bring about so desirable a state of things.

BOOKS, ETC., RECEIVED.— *Annales Hydrographiques, etc.*, from the Depot des Cartes et plans de la Marine, Paris; Patents and Patentees, Vol. 4, from the Registrar General of Victoria.

Pamphlets relating to Cholera, and the Nine hours System of Labour.

MONTHLY ABSTRACT OF NAUTICAL NOTICES.

No.	Place.	Subject.
84	Norway—West Coast—Smörhavn.	Establishment of a Light.
	„ „ Biornö Sund.	Establishment of a Light.
	„ „ Skog näs.	Alteration in Light.
	„ „ Fæö.	Establishment of a Light.
	„ East Coast—Sandvig Point.	Alteration in Light.
85	England—Thames Entrance—Margate Sands.	Alteration in position of Buoys.
86	Bengal Bay—Mutlah River—Port Canning.	Disestablishment of the Port.
87	Mediterranean—Sicily—Passaro Island.	Establishment of a Light.
	„ Adriatic—Saseno Island.	Description of the Light.
	„ „ Gelsa Port.	Establishment of a Light.
88	Brazil—Espirito Santo Bay—Santa Luzia Hill	Establishment of a Light.
89	Japan—Kiusiu—Nagasaki—Two-Sima.	Establishment of permanent Light.
	„ Simonosaki Strait—Yodsibi—Narusi and Manaita Rocks.	Erection of Beacons.
90	Baltic—Femeru Belt—Femeru Sound.	Establishment of leading Lights.
	Baltic Entrances—Siælland—East Coast—Taarbek.	Establishment of a Light.
	Netherlands—Texel—Schulpe Gat—Zanddjik.	Establishment of Beacon Lights.

NAUTICAL NOTICES.

(All Bearings are Magnetic.)

84.—Norway.—*West Coast.—Smorhavn.*—A *fixed* light of the third order showing *red* from S.S.E. $\frac{1}{4}$ E. to S.E. $\frac{1}{8}$ S., and *white* from the latter bearing round by North to W. $\frac{3}{4}$ N., has been established in lat. 61° 45′ N., long 4° 55′ E.

Norway.—West Coast.—Biorno Sund.—A *fixed white* light of the fifth order visible from E. by N., round by south to N.W. by N. $\frac{3}{4}$ N., 94 feet above the sea and visible 11 miles, has been established on the eastern part of Möen in lat. 62° 54′ N., long. 6° 49½′ E.

The above lights will be exhibited between the 1st August and the following 15th May.

Norway.—West Coast.—Skog näs Light.—A section of this light, between the bearings S. by E. $\frac{1}{8}$ E. and S.S.E. $\frac{1}{8}$ E., or between the shoals of Kraka and Melfluce will show a *flash and eclipse* alternately of *two or three seconds' duration.*

In thick or foggy weather *a bell* will be sounded giving nine strokes, with the interval of *one second, every five minutes.*

Norway.—West Coast.—Fœo Light is now exhibited, it is a fixed light of the fifth order, *white* with the exception of a portion of *red* light in the direction of and to half a cable on each side of the Gangvar Rock, it is elevated 45 feet above the sea and should be seen 9 miles. Position, lat. 59° 22½′ N., long. 5° 10½′ E.

Norway.—East Coast.—Arendal.—The Sandvig Point Light will show *red* to the eastward and white to the westward of the bearing N. ½ W., or from one and a half cables from the west point of Mardö and the east point of Inner Torungen respectively.

Note.—In entering the Inlet, keep on the boundary of the red and white lights until passed Inner Torungen, then keep well in the white light before steering for the light.

85.—ENGLAND.—*Thames Entrance.—Margate Sands.*—The *East Margate* buoy has been moved 2 cables to the eastward, and the *N.E. Spit* buoy one cable to the eastward. The *red* shade of the North Foreland Light has been altered to cover the new position of the East Margate buoy.

86.—BENGAL BAY.—*Mutlah River.—Port Canning.*—In consequence of this harbour not having answered the purpose for which it was established, it is no longer maintained, and the harbour establishments, buoys, and moorings in the Mutlah River have been removed.

The outer light-vessel and the buoy at the entrance of the Mutlah River, will be maintained for the present for the convenience of ships trading in the Bay of Bengal.

87.—MEDITERRANEAN.—*Sicily.—Cape Passaro Island.*—A new *fixed and flashing white* light, showing a flash *every three minutes*, elevated 129 feet above the sea and visible 12 miles, has been established on the N.E. angle of the fort on the island in lat. 36° 41½′ N., long. 15° 9¼′ E.

Adriatic—Sasseno Island.—The light on this island shows a *flash* of *five seconds'* duration, followed by an eclipse of fifty-five seconds. In clear weather the light should be seen from a distance of 21 miles.

Adriatic—Lessina Island.—Port Gelsa.—A *fixed white* light is now exhibited from a lamp post on the northern mole at this port, it should be een 2 miles.

88.—BRAZIL.—*Espirito Santo.*—A *fixed white* light of the fourth order has been established on the hill of Santa Luzia on the south side of the bay, it should be seen 12 miles.

89.—JAPAN.—*Kiusiu Nagasaki.—Two-Sima.*—The temporary light on this island is replaced by the permanent one; it is a *fixed white* light of first order, eclipsed landward from N.E. by N. (outside Mityuse rocks), to W. ¼ N., elevated 205 feet above the sea and should be seen 21 miles. Position lat. 32° 43′ N., long. 129° 46′ E.

Japan.—Simonosaki Strait.—The following stone beacons have been erected on the Yodsibi, Narusi, and Manaita rocks, viz.—

Yodsibi beacon is cone-shaped, painted red, 8 feet diameter at the base and 20 feet high with a plain rounded top.

Narusi beacon is cone-shaped, surmounted by a pear-shaped top, which is 20 feet above the base. The beacon is 8 feet in diameter at the base, and painted white.

Manaita beacon is cone-shaped, surmounted by a ball 3 feet in diameter and 20 feet above the base. The beacon is 8 feet in diameter at the base, and painted with black and white rings.

90.—BALTIC.—*Femeru Belt.—Femeru Sound.*—Two leading lights will be established on Femeru island, to guide vessels from Grosenbrode ferry-house into Lubeck bay,

1. A *fixed white* light of fourth order at Flugge wood, visible from W. by N. ½ N. round by North to E. by S. ½ S., 57 feet above the sea and visible 13 miles. Lat. 54° 26½′ N., long. 11° 1¼′ E.

2. A *fixed white* light of sixth order from a post on the projecting spit of Strükamp point, visible from N.W. by W. round by North to S.E. by E., 18 feet above the sea and should be seen 8 miles. Lat. 54° 24′ 40″ N., long. 11° 5′ 50″ E.

The two lights in one bear S. E. ½ S. and N. W. ½ N. distant rather more than 3½ miles.

Baltic entrances.—Sicelland.—Taarbek.— A *fixed green* light is now exhibited on the northern mole of this harbour in lat. 55 47′ N., long. 12° 36′ E. It will be exhibited from 1st August to the 1st January.

Netherlands.—Texel.—Schulpe Gat. The two lights, of which notice has been before given, are now exhibited, viz. :—

1. A *white light* of the fourth order northward of the inner Zanddjik beacon 64 feet above the sea, should be seen 10 miles.

2. A *white light* northward of the outer Zanddjik beacon 36 feet above the sea, and visible 6 miles.

Both lights are on the same bearing and the same distance from each other as the beacons, and are visible between the bearings E. S. E. and S.E. by S.; kept in line they will lead past the South Haaks buoy, and in connection with the leading lights of Kykduire, to the outer black buoy of Schulpe Gat.

HYDROGRAPHIC.

MAGELLAN STRAIT.—SMYTH CHANNEL.

THE following information relative to sunken rocks in Goods Bay and Molyneux Sound has been received from Commander Herbert P. Knevitt, of H.M.S. *Fawn*, 1871.

Goods Bay.—A reef 1¼ cables in length, extends N.W. ½ N., from the northern point of the largest of three islands lying off the eastern point of entrance of Goods Bay; a rock on which the *Fawn* struck lies 170 yards from the island point; it dries at low water springs, and has 5 fathoms just outside, with 4, 7, and 3 towards the point.

This reef at certain times of the tide is well marked by kelp, but this marking must not always be depended upon, as at the time of the *Fawn's* striking the kelp was not visible.*

Molyneux Sound.—A rock with 9 feet water on which the *Fawn* struck lies W.N.W., distant about 1½ mile from the northern point of entrance to Molyneux Sound, the south entrance point bearing S.E. by S. The rock is about 50 feet long south-east and north-west, and is steep-to, having 2¼ to 28 fathoms within a cable on its northern side, and from 2½ to 20 fathoms at about 50 yards from its southern side; in a north-west direction from the rock, for a distance of 3 cables, the bottom is level with 20 and 21 fathoms.

The rock is marked by kelp, but the prevailing strong current prevents the weed from showing itself until it is twenty yards distant from the position of the danger.

During the twelve hours the *Fawn* remained at Molyneux Sound, both ebb and flood set over the rock to the north-west, running from two to three hours before low water, with a velocity of 2½ knots.

Red Sea.—Strait of Jubal.

The following information relative to the position of a sunken rock in the anchorage bay on the south-west side of Shadwan island, is from the survey now in progress by Captain G. S. Nares, R.N., of H.M. Surveying Vessel *Shearwater*, 1871.

The small sunken rock, described in page 113 of the "Sailing Directions for the Red Sea," to be nearly in the middle of the bay, recommended as an excellent anchorage during north-west winds, on the south-west side of Shadwan island; is situated much nearer the shore and the anchorage limits than is shown by the detached danger on the chart No. 2838.

It lies about 5½ cables from the shore, with the extreme of the low sandy point forming the western side of bay bearing N.W. by

* Captain Mayne, C.B., in his survey of Smyth channel, 1868, having reported that Goods Bay was not adapted for anchorage, and should therefore be avoided, the plan on Chart No. 2864 has been cancelled.

W. ¾ W., distant 8½ cables, and is thus nearly in the middle of the anchorage bay.

This rock can be seen with a proper look-out, having only 2 or 3 feet on it, or nearly awash. Five fathoms was found inshore of the rock, and 6 and 7 fathoms on its southern side.

China.—West Coast of Korea.

The following information relating to the Sir James Hall group of islands, off the west coast of Korea, was obtained during a brief visit in H.M.S. *Ringdove* in 1871, by Navigating Lieutenant James Cole, R.N.

The Sir James Hall group consists of three principal islands, lying nearly north and south, and were sighted by the *Ringdove* at a distance of 30 miles.

The native names of the group were ascertained to be, Southern island, Soo-cheng-tao; Middle island, Ta-cheng-tao; and Northern, Peh-leng-tao.

Soo-cheng-tao or *Ringdove Island* has off its south-west point a dangerous reef (with some of the rocks always uncovered), extending in a south-west direction for about a mile; 19 fathoms, sand and mud, was obtained at a distance of nearly 2 miles off the south-west point of the island.

The south-east point of the island is remarkable from its being fronted with white cliffs. A sharp conical rock lies about a quarter of a mile to the east-south-east of the point.

Detached rocks as also the appearance of shoal water extend for half a mile from the east side of the island: soundings in from 10 to 13 fathoms were obtained at a distance of about 1½ mile from the shore.

The *Ringdove* anchored in a bay, in which are two villages, on the south side of the island, in 9 fathoms, sand. This bay affords shelter from W.S.W. round by north, to E. by N., but is entirely open to the southward. Vessels on entering this bay from the westward, should not approach the south-west point of the island nearer than 2 miles until the centre of the bay bears N.N.W., when they may steer in, and anchor in 8 fathoms.

With the conical rock off the south-east point of the island bearing E. by N., and the centre of the western village N.W. ¾ N., there is a depth of 7 fathoms.

Ta-cheng-tao or *Hertha Island* is the middle island of the group, it has a conspicuous hill or peak about 900 feet high, with a conical

form when seen from the westward. A small islet, 170 feet high, lies about one mile off the west side.

On the south-east side of the island is a bay with a shingle beach, in which the *Ringdove* anchored in 8 fathoms, sand, off a small village, with the east point of the bay bearing N. by E. $\frac{1}{4}$ E., and centre of village S.W. by W. $\frac{3}{4}$ W. The anchorage is protected from S.S.W. round by west to N. by E.; Ringdove island affords further shelter from heavy seas from the southward; it is therefore preferable to the anchorage in the south bay of that island.

Peh-leng-tao or *Ocean Island* is the northern and largest of the group. The north-west point of the island is fronted by bold perpendicular cliffs about 300 feet high. Off the extreme point is a needle or finger-shaped rock about 150 feet high.

Along the north-west side of the island, a few detached rocks extend a cable off shore.

Off the south point of the island, there is a remarkable rocky islet, with a large wedge-shaped hole through its north side. About $1\frac{1}{4}$ miles to the southward of this perforated islet is a sharp rock 50 feet in height, with a ledge of rocks extending one-third of a mile from its north side; two of these rocks are always uncovered. At a quarter of a mile south of the 50 feet rock is broken water, having the appearance of a rock nearly awash at low water.

About three quarters of a mile to the east-south-east of the perforated islet are some detached rocks, the outermost of which is 20 feet high. Between these rocks and the ledge of rocks to the north of the 50 feet rock is a channel carrying from 7 to 8 fathoms in it.

The *Ringdove* anchored off a small village in a bay near the south-west point of the island, about three quarters of a mile from the shore, in 12 fathoms hard mud. From the anchorage, the perforated islet, which is off the east point of the bay (south point of Ocean Island), bore E. by S. $\frac{1}{2}$ S.; the 50 feet rock S.S.E. $\frac{1}{2}$ E.; and a clump of trees in the valley behind the village N. $\frac{1}{4}$ E.

The hills at the back are smoothed-topped and covered with grass, and can easily be distinguished when standing in from the south-eastward.

By observation the *Ringdove's* anchorage is in lat. 37° 55′ N., long. 124° 45′ E.*

* This position would place the Finger rock off the N.W. point of Ocean Island in 37° 58′ N., 124° 42′ 30″ E.

The position of this rock on the charts, 37° 57′ 30″ N., 124° 34′ 30″ E., is given on the authority of a survey of the entrance of Ta-Tong river, by Commander Shufeldt, of the United States Navy, 1867.

No rocks were observed above water in the channel between Ringdove and Hertha Islands.

In the channel between Hertha and Ocean islands, broken water was seen in several places, particularly off the north side of Hertha island; in many cases this appearance was probably occasioned by the tide, but from soundings having been struck in 7 fathoms suddenly after a depth of 13 fathoms shows there is an irregular bottom, and that caution is necessary in using the channel.

Tides.—Between the islands, the flood-stream sets to the west, and the ebb-stream to the east.

Off the west side of Ocean (the north) Island, the flood-stream sets north, and the ebb-stream south, from $1\frac{1}{2}$ to 2 knots an hour. Off the north-west point of Ocean Island the time of High water at full and change was approximately considered to be 4 h. 30 m.

Sarawak River, Coast of Borneo.

The following information relative to a sunken rock in the Mortabas entrance of the Sarawak River has been received from Commander W. Chimmo, R.N., of H.M. Surveying Vessel *Nassau*, 1871.

The barque *Otter*, on her way down from Quop anchorage, struck and remained some hours on a pinnacle rock, with only 3 feet on it at low water springs, and deep water all round.

The rock lies nearly in the middle of the river, $1\frac{3}{4}$ miles within the entrance points, and E.N.E. about 9 cables from the Belcher Rock.

The Pilots and small steamers navigating the river always pass to the southward of the rock.

Commander Chimmo farther gives notice of the following beacons near the town of Sarawak:

The "Rocks—hug this shore" beacon, abreast of Samarang Rocks, has been blown down.

A beacon, "keep mid river," is placed in the water nearly opposite the Sago factory, and W. $\frac{1}{2}$ S. about $4\frac{3}{4}$ cables from the western Samarang Rock. This direction beacon is to clear a ledge of rocks running off the southern shore, having only 9 feet at low water.

Sulu Sea, Western Part.

The following has also been received from Commander Chimmo:

Viola Rock.—A coral patch, having only 4 feet on it at low water,

on which the Spanish vessel *Viola* struck and remained twenty-three hours, lies about 40 miles East of Balabac Island.

There is no doubt as to the existence of this danger, and from information received, its probable position is in lat 7° 50′ N., and long 117° 40′ 50″ E.

North Pacific Ocean.—Gulf of Fonseca.

The following account of a sunken rock lying nearly in the fairway of the channel leading to Amapala, on Tigre Island, in the Gulf of Fonseca, has been received from Commander Herbert P. Knevitt, R.N., H.M.S. *Fawn*, 1871.

A pinnacle rock, at present well marked by the wreck of a steam-vessel, lies 120 yards to the westward of Knob Island with a depth of 6 fathoms twenty yards to the westward of the wreck, and 4½ fathoms between it and the land.

From the wreck, the north and south extremes of Knob Island bear N.E. ½ E. and S.E. respectively, and the south-western point of Tigre Island S.S.E. ¼ E.

The funnel of the steam-vessel shows well above water at all times of the tide, and may stand for a long time, but on the removal of this mark the rock will become a formidable danger, as a bank has formed round the wreck, and appears to extend towards Knob Island.

The tide at a quarter flood sets past the rock at the rate of 2 to 3 miles an hour.

West Indies.—Bemini Islands, Florida Strait.

The following information with reference to a shoal, affecting the navigation on the bank of soundings near the Bemini Islands, in Florida Strait, has been lately received.

A shoal, locally known as the Henry Bank, is stated to lie about N.N.W. half a mile from the south point of South Bemini Island, and at a distance of a quarter of a mile from the shore; this shoal is considered to have a depth of about 3 feet on it, with 3 fathoms on its inshore side.

As two small vessels, when passing South Bemini Island and closing the shore for the purpose of avoiding the Florida stream, are reported to have struck on this bank; it is recommended, from the bottom being coral and the depths irregular, that vessels should, when on the bank of soundings, not approach this part of South Bemini Island without due caution.

GENERAL.

ROYAL NATIONAL LIFE-BOAT INSTITUTION.—A meeting of this Institution was held on Thursday, 3rd November, at its house, John Street, Adelphi; Thomas Chapman, Esq., F.R.S., V.P., in the chair. The minutes of the previous meeting having been read, £990 were voted to the crews of various life-boats for different services rendered during recent storms, and for exercising the boats during the past quarter. Among the services rendered the following may be mentioned. It appears that on Sunday, 29th October, during a strong south-easterly gale, and in a very heavy sea, the Ramsay life-boat *Two Sisters* was the means of rescuing the crew of three men from the schooner *Pansilippo*, Robert Kissack, master, which, while on a voyage from Whitehaven with coals, had been caught in the gale, and after losing her mainboom and having her mainsail split had gone ashore in a leaky state to leeward of the North Pier at Ramsey, and had soon become waterlogged, the sea breaking heavily over her. It was not without some difficulty, on account of the strength of the wind and sea, that the life-boat was enabled to regain the harbour with the shipwrecked men. On Tuesday evening, the 1st November, the brigantine *Nowal*, of Sunderland, bound from Seaham with a cargo of coals, while lying at anchor in Yarmouth Roads, sprung a leak, and the water gained on the vessel so fast that signals of distress were made, whereupon the Yarmouth life-boat *Mark Lane* and the Caister life-boat went to the assistance of the distressed vessel. The latter boat was enabled, with the help of a steamer, to take her safely into the harbour at Gorleston, by which time she had nine feet of water in the hold. The same night the Howth life-boat saved the crew of five men of the schooner *Adelaide*, of Malahide, which had gone ashore on the Baldoyle Sands in a gale of wind and very heavy sea. It was also reported that on the occasion of the exercise of the Salcombe life-boat last quarter, in a strong wind and heavy sea, the Kingsbridge Packet Steamer, came out of that harbour, bound for Plymouth, and shortly after she had passed the Salcombe Mewstone her machinery gave way, when she became disabled, and rapidly drifted to leeward in the direction of the rocks. The life-boat at once went to her assistance, and eventually the steamer got into harbour, and, on entering the smooth water, she was enabled to use her engines and go to Kingsbridge for repairs. A reward of £5 was also granted to six men who put off in shore boats, and were

enabled to save four out of six coast-guardsmen whose boat had been capsized off the Rosslare (Wexford) Coast-guard Station during an easterly gale on the 29th of September last. Payments amounting to £1,842, were also ordered to be made on various life-boat establishments. A contribution of £14 10s. had just been forwarded to the Institution by Captain Giles, the master attendant at Kurrachee, India, being the proceeds of an entertainment given in the Frere Hall at that place, by some ladies and officers of the garrison in the town, on behalf of the Life-boat Fund. The late Mrs. Walmesley, of Connaught Square, had left the Society a legacy of £300 free of duty. New life-boats had been sent by the institution during the past month, to Walmer, Kent, and Pembrey, South Wales, and it was also decided to form life-boat establishments at Clogher Head and Giles's Quay, county Louth.

THE LIGHTHOUSE ON CAPE AGULHAS.—With reference to this lighthouse the *Cape Argus* expresses the opinion that it "is so badly situated that it is almost as much calculated to lure vessels to their destruction as to warn them away from danger. The height of the lantern is now 128 feet, and the radial range of its visibility is 18 miles; but the worst of it is that, on account of an intervening hummock, it is quite invisible inside of the Atlas Rock, and all along the Bight of Struy's Bay. The result is, that vessels coming up from Cape Infanta, and being once too far in shore, can never see the light at all until they strike on inevitable destruction somewhere along the coast. As a matter of fact, we are aware that in the great majority of instances wrecks have occurred there either by daylight, or without the verge of darkness at night. Still, however, it is no less true that vessels may be lured into a *cul de sac* looking for a light, which, from their position, is absolutely invisible. And there is, also, the curious and awkward fact that while, before the erection of the lighthouse at Agulhas, the only wrecks recorded were of vessels from the westward, since then the only wrecks recorded have been of vessels from the east. We may further add, that both Sir Thomas Maclear and Captain Skead were opposed to the position assigned to the light. That position it is now proposed to alter to a higher one—300 feet in elevation, not far distant from the present site, but such as will give a radial range of 25 miles, and will extend not merely seaward, but cover the whole coast and some distance inland. This will be an improvement of immense benefit, and we cannot doubt that it will be promptly carried out. And at the same time we hope and believe that a new lantern apparatus will be provided. The present one is

classed as of the first order; but we have been informed on very high authority that it is so defective in its structure that only about one-third of the actual intensity of light produced is projected beyond the lighthouse tower."

THE PROPOSED SHIP CANAL ACROSS THE ISTHMUS OF DARIEN.—There seems to be a strong probability that this great work will be undertaken. We understand that two well known and influential gentlemen from America have arrived in England with the mission of moving the maritime Governments of Europe to take part in the scientific investigation for a ship canal through the American Isthmus, and guaranteeing its neutrality when made. Numerous routes have at different times been proposed for a canal to connect the two oceans, but the continuance of the mountain chain of North America through the Isthmus into South America has effectually prevented the carrying out of any project. We now learn that Lieutenant Selfridge, who has been for some time exploring and surveying the interior of Darien, has discovered a practicable route where the greatest elevation is only 300 feet.

This route is by the Atrato River, a deep, sluggish stream, running into the Gulf of Darien, and the Juzra River emptying itself into the Gulf of San Miguel on the Pacific Coast. The junction between the two rivers is proposed to be effected by a ship tunnel five miles long, 170 feet high, and 70 feet wide; for three miles there will be a cutting 125 feet deep. It is estimated that the total amount of excavations required will be 31,234,105 cubic yards of rock, 7,424,240 cubic yards of tunnelling, and 10,461,627 cubic yards of earth. The estimated cost is set down approximately at 124,824,290 dollars, or upwards of twenty-six million pounds.

THE COLONISTS OF AUSTRALIA.—Mr. Anthony Trollope has taken occasion to administer a mild sort of reproof to some of the colonists whom he has been recently visiting. He has discovered that the good old English custom of grumbling is rife among the settlers of Australia, who with a great many advantages are still discontented with the condition of things in the colony. So in a speech at a public dinner at Rockhampton, Queensland, he has suggested to them that things are not so bad as they are painted. The remarks of so distinguished an observer ought to be consoling to the discontented colonists; and they certainly are most interesting to all at home who are anxious for the welfare of these offshoots of Old England. Mr. Trollope spoke as follows:—"Englishmen always speak of you with a degree of veneration and love, and our feelings

are strangely wounded when, on coming here, we find one after another telling us that the colonies are going to the devil. I can assure you that we believe you are going straight to heaven. All industrious nations must go a-head. Although you all say that everything is going wrong, and although you are all complaining, yet I never see a man that does not eat three meals a day. It is not so at home. There you often find men that taste meat only three times a year. Here I see no one without clothes, if not of the best kind, yet appropriate to his position. There you often see a man in tatterdemalion rags, who wears a coat cast off by some reduced gentleman, that belonged to some flunkey before him, and perhaps a nobleman before that. You never see that here. In England they are only considering how to educate the poor. Here the children of the poorest are educated. I am surprised to find that, even where the population is very limited, a free school is established, to which the children of the poor and rich flock together. When I hear you grumble, I cannot understand the language you use. You are impatient, because you can't take wings as the eagle, and fly right off to heaven. You are really in a very prosperous state. As a stranger I have one piece of advice to give you—perhaps not to you, but to your children—and that is, do not be so much in a hurry. When you see what is your position, and also what you have done, what is the position of labour—for after all that is the main thing—you have no reason to complain. The aim of all political energy is to raise the labourer, and the labourer here occupies a grand position."

THE AMERICAN WHALING FLEET.—The particulars concerning the recent terrible disaster to this fleet are very sad. We read that, "on September 13th the Captain of the fleet, hemmed in between Point Belcher and Wainwright Inlet, held a meeting, and resolved to abandon the vessels in order to save the lives of the crews, which was done, and 1,200 sailors took refuge on board the remainder of the fleet, which had been fortunate enough to escape outside before the ice closed in on the vessels."

The number of vessels lost was thirty-three, all laden with oil, and the loss will amount to upwards of 1,500,000 dollars. The catch destroyed amounts to 13,363 barrels of whale oil, 935 of sperm, and 100,000 lbs. of whalebone.

The American Arctic whale fishery has thus met with a check so severe that it will be most difficult to recover itself. The trade has certainly been falling off of late years; the recent discoveries of mineral oils having tended greatly to lessen the marketable value of sperm. For the last ten years the number of American vessels

engaged in the trade has been steadily decreasing; whales are said to be becoming scarce, and it is to be feared that the calamity which has now happened will be a death blow to the once vigorous and prosperous trade.

It is not without some regret that we contemplate the extinction of a business associated with so much that is daring and enterprising, and which has bred so many bold spirits and self-denying mariners. We owe something to these Arctic whalers for what little knowledge we possess concerning the scene of their labours, and we have before expressed our hope that some of the few whalers from our northern ports would have penetrated to the latitude where Lieutenants Payer and Weyprecht have found open water. But we very much fear that little more is to be expected from that quarter now; the rapidly decreasing trade and the crushing effect of the late disaster will probably induce those hitherto employed in it to seek other occupation in regions where the risks are not so great, where the business is more lucrative, and where they are not exposed to the chilly, comfortless, and dreary influences of an Arctic climate.

LIFE-BOAT EXPERIMENTS.—Some interesting experiments have been recently made at Liverpool, with a new life-boat invented by Mr. William Campbell, one of the Board of Trade surveyors of steam vessels. Many of our readers are aware that the Society of Arts have offered their gold medal for a ship's life-boat suitable for the Mercantile Marine, and this invention of Mr. Campbell's is intended to compete for the medal.

This experimental boat is 24 feet in length, 7 feet 3 inches in breadth, and 2 feet 10 inches in depth. She possesses great stability, combined with a large carrying capacity. Externally she presents little difference in appearance from an ordinary ship's boat, and her internal arrangements are such as do not prevent her from being employed for ordinary ship's use. She is built on a principle which secures great strength. From the thwarts to the turn of the bilge her sides are constructed in a form of curve in some degree resembling a half-moon, the interior cavity of which is filled in with such means as afford a large amount of buoyancy. The general buoyancy, which is situated altogether in the interior of the boat, is provided for in a great number of separate parts, which are carefully protected, no one of which is carried above the height of the thwarts. The buoyancy or floatage power is distributed in the following manner:—The spaces at each end of the boat, from the stern and from the stem to the first thwart, are covered over, forming chambers. Between these, up to the level

of the thwarts, there is a longitudinal or central division, about 15 inches wide, reaching down to the bottom of the boat. On each side of this central division the bottom is divided into compartments, rising to a height of about 14 inches, and covered over by a portable platform. All these compartments, namely, the chambers at each end, the central longitudinal division, and the bottom parts, are filled with cases of metal, thickly covered with solid cork, fastened on with marine glue, and further secured from injury by an outer covering of canvas, put on with a compound which water does not affect. The cases thus ingeniously constructed are so protected as to resist a very great amount of strain whether applied vertically or horizontally. The powerful portion of the buoyancy provision being internal, portable, and independent of the skin of the boat, she may be bilged or damaged without her efficiency being in any degree impaired. The centre longitudinal division is also of great importance, as in case of shipping a sea it would prevent a sudden rush of water from one side of the boat to the other.

Another and important peculiarity of this life-boat consists in the introduction of discharge pipes fitted into her bottom. The tops of these are covered by self-acting valves, so adjusted as to open instantaneously on a pressure of water being applied over them, by which means the boat at once discharges herself of any water she may have shipped.

The lowering apparatus consists chiefly of spiral blocks fitted at about four feet from each end of the boat. Between these, in the centre of the boat, there is a simple apparatus, controlled by a portable lever. Ropes are fastened to the outer end of each davit. These are wound round the spirals, and thence are taken to the centre apparatus, where the lowering is effected by one man, and the boat is at once disengaged from the ship.

The air-tight cases which ensure the buoyancy of the boat offer likewise important facilities for securing a moderate supply of small stores and personal comforts for her living freight, without to any serious extent lessening the safety or floating capacity of the life-boat.

The experiments were of such a character as to inspire every confidence in the new boat. First of all it was lowered into the water by the new and ingenious apparatus. In order to test her steadiness and buoyancy, about a score of men stood on the gunwale. The boat was also filled with water up to the gunwale, and the self-acting valves in the bottom cleared her in little over a minute. The final experiment was hauling her up at one end and letting her go by the run, which was done with several persons on

board, including, of course, the inventor, who all got a complete wetting from the spray which the boat threw about. The experiments were highly successful, and many gentlemen who witnessed them have expressed their opinion that the new life-boat is well worthy of the attention of the shipping community.

GREENWICH HOSPITAL.—Mr. Goschen has paid a visit to Greenwich Hospital, with the view, we believe, of considering its fitness for the proposed Naval University. But it is not generally known that there is another movement afoot for giving a wider destination to the old palace by converting it into a great University of technical science. We have no reason to suppose that the two designs are inconsistent with each other; but we hope to be able to give some further information on the subject at an early opportunity.

EMIGRATION TO CANADA.—We have still to notice the great contrast between the way in which the British press is used for the furtherance of emigration to the States or Australia and to Canada. Every now and then long letters from emigrants find their way—perhaps as advertisements—into both the metropolitan and provincial papers, praising up this or that part of the States, or Australia, or Natal; but the notices of Canada are few and far between. Among the high and the low in Britain a wonderful amount of ignorance prevails about our country, and apparently we care not though it continue. As Colonel Haultaine mentioned in his letter to the *Globe* the other day, Canada is still in Britain an unknown land, even in intelligent circles. And we need scarcely wonder at this when visitors like Dr. Blaikie, of the Presbyterian deputation of last year, speaks, as that gentleman does in "Good Words," of the French Minister and his few acres of snow, and introduces his remarks upon Canada with a reference to the proverb, "Blessed is he that expects nothing, for he shall not be disappointed."—*Toronto Globe.*

GLATTON, 2, double-screw armour-plated turret-ship. This formidable vessel is 3ft. above the water, and can be reduced, if necessary to 2ft. by flooding her water spaces. She draws 19ft. of water, and the height of her hurricane deck is nearly 22ft., so that from top to keel she is barely 40ft. Her length is 264ft., and her breadth 54ft. The *Glatton* maintains this great breadth almost throughout, broadening out at once both fore and aft with as little symmetry as a spoon, which, indeed, her main deck in no slight degree resembles, except that it is flat instead of concave. Her main deck is, fore and aft, for all the world like a spoon-shaped wharf, perfectly flat, with no

bulwark or anything but a single iron chain running round it. As it is only three feet above the water, and there is nothing to keep this off in rough or even roughish weather, every wave would break over it—it would be practically under water; but the *Glatton* thinks nothing of this, and has quite made up her mind and machinery to it. The sea may rush over and about her as much as it pleases, it can't get into her. She carries her armour-plating outside, and it extends 7ft.—this is 4ft. above and 3ft. below water. Its thickness all round is 12in. iron above and 10in. below, with 16in. oak, except near her extremities, where the iron is 8in. As a general rule, her armour consists of wood between two plates of iron. Thus, her turret is protected laterally by 12in. iron, then 16in. teak, and then a so-called skin plate of $2\frac{5}{8}$in. The armour of her breastwork is almost to an inch the same. Some notion may be given of the protective power of her armour by mentioning that it exceeds 1100 tons in weight. Her tonnage is over 2700, and she carries 500 tons of coal. Deck No. 2 is even less, if possible, like an ordinary deck. It is called the breastwork deck, or turret deck, because it is formed by the surface of the breastwork or massive covered platform of iron, about 7ft. high, and 120ft. long, running irregularly round the central compartments of the ship, protecting the vitals, such as the base of the turret (on which the whole fighting power of the ship depends), and the bulk of the machinery. Her turret revolves either by steam, in about thirty seconds, or by hand, in about three minutes. As both her two guns can rake directly aft within a few inches of the base of her hurricane deck, as well, of course, as forwards and to both sides, the revolution is as perfect as it can be. The guns are 12in. bore, weighing 25 tons each, and doing good work with a 600lb. shot or shell at 4000 yards. Their lowest depression, port and starboard, is 5 deg., and the shot can strike the water so near as 20 or 30 yards. Their highest elevation is 14 deg. The largest or battering charge of powder is 75lb. Deck No. 2 ends forward at the turret, but aft it is continued by a light platform, very like a pretty miniature pier, supported on slender shafts. About a dozen feet above deck No. 2, but not commensurate with it, comes No. 3, or the hurricane deck, a portion of it being of the same elegant pier-like pattern; but its most distinctive feature—at least to the eye—is that it is closed in all round by hammock nettings, above which are swung the boats. Another curious feature of the hurricane deck is the conning or pilot tower, about 10ft. deep and $2\frac{1}{2}$ft. square—a decidedly tight fit for a stout man, especially as part of the room is taken up by a ladder, a small steering-wheel, an indicator communicating with the turret, and three speaking-tubes

communicating respectively with the turret, the engine-room, and steering-wheel. It is probable that the pilot tower would never really be made much use of, but that the Captain would fight his ship in the turret, from which he steers by sounding tubes. So much for the exterior of the *Glatton*—that is, from a general and very rough bird's-eye point of view. Horizontally the interior is divided into three flats, except in the regions of the boiler and engine: the first consisting of the officers' and men's quarters; the second of store and ammunition rooms; with here and there empty spaces; and last and lowest of all comes the double bottom. Vertically the interior is divided into nine compartments, of which any one can be at a moment's notice isolated completely from all the rest, and have water, for instance, furiously pumped into or out of it by a system of piping, while the adjoining compartment is perfectly dry. This principle of isolation, intended obviously to prevent partial injury from becoming general, is one of the cardinal characteristics of the ship's construction, and is carried so far that not only each of the nine compartments, but even the subdivisions of these compartments, can be turned each into a little self-sufficing world of its own, to be destroyed by fire or water without involving other worlds in its destruction. In fact, almost every space in which a human being can turn round is an air-tight box fitted up with the most ingenious contrivances, not merely for isolating it, but for doing so from above—if necessary, without approaching it—and when you have done it informing you by tell-tale indicators that it is done. There are actually somewhere about 250 appliances, for keeping up this intercommunication in the shape of water-tight doors, hatches, valves, pipes, and tubes. There is an admirable system of ventilation. The air is forced by steam-worked fans into a labyrinth of pipes, permeating the vessel as arteries the human body, and by simply turning a cock in any one of these pipes air is let into each room or safe as easily as water.

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NOTICES CONCERNING LIGHTS, ETC.

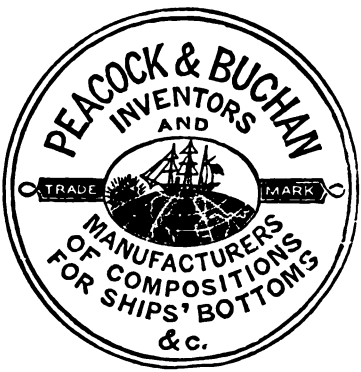
END OF VOL. XL.

Prize Medal, awarded

AT THE

Havre Exhibition of 1868,

TO



THEIR

Number 1

COMPOSITION (light green) is admirably adapted for preserving copper or yellow metal sheathing from waste; making it last three times as long by giving an annual coating; and returning a much greater percentage of old metal than if left to its ordinary wear without coating.

THEIR

Number 2

ANTIFOULING COMPOSITION (pink) *contains no copper*, and is prepared exclusively for the bottoms of

Iron Ships,

protecting the plates and rivets from corrosion or galvanic action, and from ordinary *fouling*; also giving *additional speed*, as shortly after immersion the surface becomes slimy *like the back of a fish* (see over).

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Their **Number Three** Composition is prepared in fifteen shades of colour, for Ships' topsides, 'tweendecks, cabins, boats, spars, &c., and is, like the other numbers quoted above, *mixed ready for immediate use*; it stands better than ordinary paint without blistering—washes well—dries quickly, keeps good in *any climate*, being put up in hermetically sealed cans from 7 lbs. upwards, and does not deteriorate; *enabling every man to be his own painter in any part of the world. The Royal National Lifeboat Institution* adopted it in 1862, and find it *very economical* and lasting. *See Pamphlet, pages* 69 *to* 84.

Their **Number Four** Composition (copper colour) is prepared for single bottomed vessels, ships' bends, the bottoms of lighters, barges, dreghers, and boats; protecting them from worm and fouling; also for preserving railway sleepers, telegraph posts, gate posts, &c., from white ant and decay *(see pages* 85 *to* 91 *in Pamphlet)*.

PEACOCK AND BUCHAN'S *new* anticorrosive metallic paint for all ironwork, &c., out of salt water will be found cheaper and better than *red lead*.

The Peninsular and Oriental Co., the Royal West India Mail Co., the Pacific Steam Navigation Co., African Royal Mail Co., Australian S. N. Co., &c., and many other great companies still use Messrs. Peacock and Buchan's *economical* Compositions on the bottoms of their magnificent Fleets, in preference—after repeated competitive trials with every other known composition in all parts of the world.

Shipowners are now alive to the importance of avoiding PREPARATIONS OF COPPER AND MERCURY, after the fearful destruction recently evinced by galvanic action on the plates and rivets of many iron and composite ships *(see pages* 1 *to* 37 *and appendix in Pamphlet)*.

The **British Admiralty** are now using Messrs. Peacock and Buchan's *economical* Compositions on *many* of the Iron Ships of the Royal Navy, and the reports are very favourable in comparison with the numerous applications their Lordships are patriotically and periodically trying from other inventors: most of whom use *copper* or *mercury* as a base, and are *very expensive*, without any comparative advantages.*

Apply to the Manufacturers direct, **Southampton**; or at their **London** Office and Depôt, 39, Up. East Smithfield, opposite the London Docks, In **Liverpool** to Messrs. E. C. Thomas & Co., 44, Queen Street, Princes Dock, or Messrs. H. Morison & Co., Waterloo Road. In **Glasgow** to M'Symon and Potter, Clyde Place; and to their accredited Agents at other Seaports of the United Kingdom, and Colonial Possessions in all parts of the world. See Pamphlet, sent free on application with six stamps.

H.M. Ships *Monarch, Thunderer, Jumna, Himalaya, and Tamar* were coated with the No. 2 Anti-fouling Composition of Messrs. Peacock and Buchan, during the year 1870.

* By a Parliamentary return lately called for, no less than thirty-one different *"anti-fouling"* Compositions have been tried in the Royal Dockyards, and rejected as failures in competition.

PLEASE TURN OVER

THE FOLLOWING TESTIMONIALS

Have been forwarded to Messrs. Peacock and Buchan from highly respectable sources, IN ADDITION to the numerous Certificates previously received from all parts of the world, the originals of which can be seen at the Office of the Manufacturers, Southampton:—

From the "Daily News" of 18th January, 1871.

"PORTSMOUTH, JAN. 17.—The *Himalaya* troopship has just completed another 10,000 miles. The passage from Halifax to Queenstown was performed in nine days and half an hour, the troopship beating the mail-steamer by one day. Her next voyage will be to the Mediterranean." N.B.—This ship was coated last year with Messrs. Peacock and Buchan's "Anti-Fouling Composition," before leaving for the West Indies, and is now found to be so clean that she does not require to be docked again on commencing her new troop service for the present year!

From Messrs. Broomfield and Whitaker, Merchants and Shipowners, Sydney, N. S. W.

Albion Wharf, Sydney, 4th December, 1870.

Messrs. Peacock and Buchan, Southampton.

Dear Sirs,—About four years ago, having heard of your compositions, we ordered a few cwts. for trial on some of our iron steamers in this colony, which turned out so satisfactory that we have been induced to send you orders from time to time, and the few cwts. have grown to tons; indeed, your manufactures have become an important colonial staple.

An extraordinary test of your No. 2, for the preservation of iron, came under our observation in the case of one of the first iron steamers, belonging to the Australian Steam Navigation Company, which had been coated with your composition. She had been sunk under salt water in our harbour for nearly ten years, and the iron plates, coated with your No. 2, were found on examination to be perfectly sound and uninjured, whilst the inside and uncoated portion of the plates were completely honeycombed, and almost eaten through by the action of the salt water on them.

Most of our local iron steamers now use your "Anti-Fouling Preservative Composition," and we might add, in passing, that having had frequent opportunities of examining the bottoms of the whole of the iron fleet belonging to the Australian Steam Navigation Company, who for the last fifteen years have used your composition exclusively, we can unhesitatingly state that in no instance have we found these plates injured or deteriorated in any way.

With respect to your No. 3, for ships' topsides, boats, spars, cabin, &c., as well as for house purposes, we find it answer well in every way—drying very quickly, keeping in a sound state, and bearing scrubbing without washing off. For sea stores it is excellent, as, being mixed ready for use, no spirits of turpentine or oil are required to be carried to sea. For town use we have a very large demand, especially for places in the interior, where economy of labour is important, and "*every man*" can indeed become "*his own painter;*" and we feel assured that when this handy form of paint becomes more known in the interior of the colony, it will supersede all ordinary paint. We are daily expecting the arrival of the four tons ordered of you by the July mail, which order we have had much pleasure in repeating by each succeeding mail, and expect to increase our monthly orders during next year. We have much pleasure in sending you this letter as a testimonial, which you may make any use of you please. Wishing you the compliments of the season, We remain, dear Sirs, yours very faithfully,

(Signed) BROOMFIELD AND WHITAKER.

Ship *Halcione*, London, May 2nd, 1870.

Messrs. Peacock and Buchan.

Dear Sirs,—Whilst in Wellington, N. Z., towards the end of last year the iron SS. *Taranaki*, of about 450 tons, was towed across Cook's Straits from Queen Charlotte's Sound, where she had been lying sunk at the bottom in seventeen fathoms of water for over twelve months, having just been raised. The top-sides, which had been simply painted with ordinary black, had a *very thick incrustation of barnacles, &c.*, but below this all we could see of her bottom (coated with your composition) was *perfectly smooth and clean*, and the composition apparently quite intact. She had not been, I was informed, touched or cleaned in any way from the time of raising, which I believe was only a day or two. Should this account be of any use to you, you are quite welcome to make it public. For myself, I have a very high opinion of your compositions, when put on properly, and not tampered with. My Chief Officer also bears testimony to the above.

We remain, dear Sirs, very truly yours,

(Signed) THOS. BISHOP, Master of Ship *Halcione*. ROBT. WRIGHT, Chief Officer.

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OFFICIAL NOTICES.

NOTICE TO MASTERS AND OWNERS.

The subjoined communication upon the subject of the Carriage of Dangerous Goods has been received by the Board of Trade from Her Majesty's Consul at Bordeaux.

THOMAS GRAY.

DESPATCH REFERRED TO.

"Bordeaux, March 10th, 1871.

"Sir,—I have been requested by the Mayor of Bordeaux to caution the Masters of British Vessels against exporters who practise the shipment of explosive and inflammable goods under false denominations; the law of France authorizing the forfeiture, not only of such falsely manifested goods, but also of the Ships importing them.

"It is, therefore, my duty to communicate this request to you; although it must, in most cases, be practically impossible for a Shipmaster to ascertain what are the contents of packages received into his Vessel.

"The Assistant Secretary, "I am, Sir,

"Marine Department, Board of Trade, "Your obedient servant,

"March, 1871. "(Signed) THOMAS CAREW HUNT."

OFFICIAL NOTICES, Continued.

NOTICE TO BOILERMAKERS, MANUFACTURERS, ETC.

Sluice Valves, Boilers, Stop Valves, etc.

The following are extracts from Instructions issued by the Board of Trade to their Surveyors, with respect to sluice valves, cast iron in boilers, and stop valves:—

Sluice Valves.—"All pipes passing through the sides or bottom of a vessel at any place near to or below the load water line should be fitted with sluice valves, or cocks *attached to the plating of the vessel*, and so arranged that they can be opened or closed at any time. Unless the pipes referred to are so fitted, the Surveyor should not grant a declaration."

Cast Iron in Boilers.—"In all Boilers in which the Surveyors find that cast iron is employed in such a manner as to be subject to the pressure of steam or water, they are directed to report the circumstances to the Board of Trade, in order that they may receive instructions how to act.

"If in any case it should come to the knowledge of the Board of Trade that a Surveyor has disregarded this Instruction, he will be deemed to have acted in opposition to their directions."

Stop Valves.—"Surveyors should decline to give declarations, unless there is a stop valve between the boiler and the steam pipe."

Board of Trade, Marine Department, March, 1871. THOMAS GRAY.

NORTHERN LIGHTHOUSES.

NOTICE TO MARINERS No. 10.

BELL ROCK LIGHTHOUSE.

INCREASED SPEED OF REVOLUTION.

The Commissioners of Northern Lighthouses hereby GIVE NOTICE, that on and after Monday, *the 24th day of April*, or if the state of the weather prevents a landing being made, as soon thereafter as practicable, the speed of Revolution of the Revolving Red and White Lights on the Bell Rock will be altered from a Flash every Two Minutes to

A FLASH EVERY MINUTE.

By order of the Board.

Northern Lighthouse Office, Edinburgh, April 1, 1871. (Signed) ALEX. CUNINGHAM, *Secretary.*

NORTHERN LIGHTHOUSES.

NOTICE TO MARINERS.

No. 14.

CORSEWALL LIGHTHOUSE, FIRTH OF CLYDE.

INCREASED SPEED IN THE REVOLUTION OF THE LIGHT.

The Commissioners of Northern Lighthouses hereby GIVE NOTICE, that on and after Monday, *the 15th day of May*, the speed in the Revolution of the Revolving Red and White Lights on Corsewall Point, Wigtownshire, will be altered from a Flash every Two Minutes to

A FLASH EVERY MINUTE.

By order of the Board.

Northern Lighthouse Office, Edinburgh, April 26, 1871. (Signed) ALEX. CUNINGHAM, *Secretary.*

Royal National Life-Boat Institution.

INCORPORATED BY ROYAL CHARTER. SUPPORTED SOLELY BY VOLUNTARY CONTRIBUTIONS.

Patroness—Her Most Gracious Majesty the Queen.

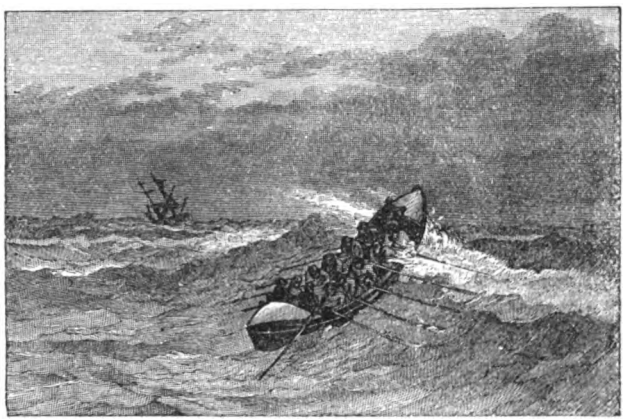
Vice-Patron—His Royal Highness the Prince of Wales, K.G.

President—His Grace the Duke of Northumberland, P.C., D.C.L.

Chairman—Thomas Baring, Esq., M.P., F.R.S., *V.P.* Deputy Chairman—Thomas Chapman, Esq., F.R.S., *V.P.*

Secretary—Richard Lewis, of the Inner Temple, Esq., Barrister-at-Law.

Life-boat Inspector—Capt. J. R. Ward, R.N. Assistant Life-boat Inspector—Capt. D. Robertson, R.N.



APPEAL.

The Committee of Management have to state that, during the past year, and the first ten months of the present year, the Royal National Life-boat Institution has expended **£46,331** on various Life-boat Establishments on the Coasts of England, Scotland, and Ireland, in addition to having contributed to the saving of **1,883** persons from various Shipwrecks on our Coasts.

General Summary of the Work of the Institution during the past Twenty-two Months.

			£.	s.	d.
Number of Lives rescued by Life-boats, in addition to 55 Vessels saved by them	..	1,277	..	..	
Number of Lives saved by Shore-boats, &c.	..	606	..	..	
Amount of Pecuniary Rewards for Saving Life	..	..	4,707	17	8
Honorary Rewards:—Silver Medals	26	..	..	..	
Votes of Thanks on Vellum and Parchment	36	..	..	..	
Total	62	1,883	£4,707	17	8

The Committee desire to acknowledge with gratitude the liberal support which they have received from the British Public during the past few years,—a support which has enabled them to establish their present great Fleet of **223** Life-boats on the shores of the United Kingdom. Deeply sensible, however, of the great responsibility that rests on them to maintain their Fleet in a thoroughly efficient state, and its crews practised in the management of their boats, which can only be effected by a large and *Permanent Annual Income*, they earnestly appeal to all classes of their countrymen to continue to aid them in upholding and perpetuating so great and truly national a work.

The number of Lives saved either by the Life-boats of the Society, or by special exertions, for which it has granted Rewards, since its formation, is **19,732**; for which services **90** Gold Medals, **818** Silver Medals, and **£33,941** in cash have been paid in Rewards.

The expense of a Life-boat, its equipment, transporting-carriage, and boat-house, averages **£680**, in addition to **£50** a-year needed to keep the station in a state of efficiency.

Donations and *Annual Subscriptions* are earnestly solicited, and will be thankfully received by the Bankers of the Institution, Messrs. Willis, Percival, and Co., 76 Lombard Street; Messrs. Coutts and Co., 59 Strand; Messrs. Herries, Farquhar, and Co., 16 St. James's Street, London; by all other Bankers in the United Kingdom; and by the Secretary, Richard Lewis, Esq., at the Office of the Institution, 14 John Street, Adelphi, London, W.C.—*November*, 1870.

Royal National Life-Boat Institution.

Supported solely by Voluntary Contributions.

LIST OF THE LIFE-BOAT STATIONS OF THE INSTITUTION.

ENGLAND.

NORTHUMBERLAND—
1 Berwick-on-Tweed.
Holy Island, No. 1.
" No. 2.
North Sunderland.
5 Bonlmer.
Alnmouth.
Hauxley.
Newbiggin.
Blyth, No. 1.
10 " No. 2.
Cullercoats.
Tynemouth, No. 1.
" No. 2.
DURHAM . . . Whitburn.
15 Sunderland.
Seaham.
West Hartlepool, No. 1.
" No. 2.
Seaton Carew.
YORKSHIRE 20 Middlesborough.
Redcar.
Saltburn.
Runswick.
Upgang.
25 Whitby.
Scarborough.
Filey.
Bridlington.
Hornsea.
30 Withernsea.
LINCOLN . . . Cleethorpes.
Donna Nook.
Theddlethorpe.
Sutton.
35 Chapel.
Skegness.
NORFOLK . . . Hunstanton.
Wells.
Blakeney.
40 Sheringham.
Cromer.
Mundesley.
Bacton.
Hasborough.
45 Palling, No. 1.
" No. 2.
Winterton.
Caister, No. 1.
" No. 2.
50 Yarmouth, No. 1.
" No. 2.
SUFFOLK . . . Gorleston.
Corton.
Lowestoft, No. 1.
55 " No. 2.
Pakefield.
Kessingland, No. 1.
" No. 2.
Southwold, No. 1.
60 " No. 2.
Thorpeness.
Aldborough.
KENT . . . . . Margate.
Kingsgate.
65 Broadstairs.
Ramsgate.
North Deal.
Walmer.
Kingsdowne.
70 Dover.
Dungeness.
SUSSEX . . . Rye.
Winchelsea.
Hastings.
75 Eastbourne.
Newhaven.
Brighton.
SUSSEX . . . . Shoreham.
Worthing.
80 Selsey.
Chichester Harbour.
HAMPSHIRE . . Hayling Island.
ISLE OF WIGHT . Bembridge.
Brighstone Grange
85 Brooke.
ALDERNEY . . . St. Anne.
GUERNSEY . . . St. Samson's.
DORSET . . . . Poole.
Chapman's Pool.
90 Kimeridge.
Weymouth.
Lyme Regis.
SOUTH DEVON . . Sidmouth.
Exmouth.
95 Teignmouth.
Brixham.
Salcombe.
Plymouth.
CORNWALL . . . Looe.
100 Fowey.
Mevagissey.
Portloe.
Falmouth.
Porthoustock.
105 Cadgwith.
Lizard.
Mullion.
Porthleven.
Penzance.
110 Sennen Cove.
St. Ives.
Hayle.
New Quay.
Padstow.
115 Port Isaac.
Bude Haven.
NORTH DEVON. . Clovelly.
Appledore, No. 1.
" No. 2.
120 Braunton.
Ilfracombe.
Morte Bay
Lynmouth
SOMERSET . . . Burnham.

WALES.

GLAMORGANSH. 125 Penarth.
Porthcawl.
Swansea.
CARMARTHENSH. . Llanelly and
Pembrey, No. 1.
" No. 2.
130 Carmarthen Bay.
PEMBROKESHIRE . Tenby.
Milford.
Solva.
St. David's.
135 Fishguard, No. 1.
" No. 2.
CARDIGANSHIRE . Cardigan.
Newquay.
Aberystwith.
MERIONETHSH. 140 Aberdovey,
Barmouth.
CARNARVONSH. Portmadoc.
Abersoch.
Porthdinllaen.
ANGLESEY . 145 Llanddwyn.
Rhoscolyn.
Holyhead.
Cemlyn.
Bull Bay.
150 Moelfre.
Penmon.
CARNARVONSH. . Orme's Head.
DENBIGHSHIRE . Llanddulas.
FLINTSHIRE . . Rhyl (Tubular).

ENGLAND (*continued*).

CHESHIRE . .155 New Brighton No 1
Do. (Tubular) No. 2
LANCASHIRE. . . . Southport.
Lytham.
Blackpool.
160 Fleetwood.
Piel.
ISLE OF MAN . . . Castletown.
Douglas.
Ramsey.
CUMBERLAND . .165 Whitehaven.
Maryport.
Silloth.

SCOTLAND.

KIRKCUDBRIGHT . . Kirkcudbright.
WIGTONSHIRE . . . Whithorn.
170 Port Logan.
AYRSHIRE . . . . Ballantrae.
Girvan.
Ayr.
Irvine.
175 Ardrossan.
ISLE OF ARRAN . . Kildonan.
ARGYLLSHIRE . . . Campbeltown.
Southend.
CAITHNESS-SHIRE . . Thurso.
ORKNEY ISLANDS .180 Stromness.
ELGINSHIRE. . . . Lossiemouth.
BANFFSHIRE . . . Buckie.
Banff.
ABERDEENSHIRE . . Fraserburgh.
185 Peterhead.
KINCARDINESHIRE . . Stonehaven.
FORFAR . . . . . Montrose, No. 1.
" No. 2.
Arbroath.
190 Buddon Ness } Dun-
Broughty Ferry } dee.
FIFESHIRE . . . . St. Andrew's
Anstruther
HADDINGTONSHIRE North Berwick.
195 Dunbar.

IRELAND.

CO. LONDONDERRY . . Greencastle.
ANTRIM. . . . Portrush.
DOWN . . . . Groomsport.
Ballywalter.
200 Tyrella, Dundrum Bay.
Newcastle, do.
LOUTH . . . . Dundalk.
Drogheda.
DUBLIN . . . . Skerries.
205 Howth.
Poolbeg.
Kingstown.
WICKLOW . . . Wicklow.
Arklow.
WEXFORD .210 Courtown.
Cahore.
Wexford, No. 1.
" No. 2
Carnsore.
215 Duncannon.
WATERFORD . . Tramore.
Dungarvan.
Ardmore.
CORK . . . . Youghal.
220 Ballycotton.
Queenstown.
Courtmacsherry
KERRY . . .223 Valentia.

The following are Extracts from the General Rules of Management:—

"Each Life-boat to have a Coxswain Superintendent, with a fixed Annual Salary of £8, and an Assistant Coxswain.

"The Life-boat to be regularly taken afloat, fully manned and equipped, once during each quarter, so that the Crew may be familiar with her qualities and proper management. On every occasion of exercise, the men are to be paid 4s. each; and on every occasion of going off to a Wreck to save Life, each man of the Crew to receive 10s. by day, and £1 by night. These payments to be doubled on occasions either of extraordinary risk or of long exposure.

"The Life-boat is to be kept on her Carriage, in the Boat-house, with all her gear in her ready for use. Signals are agreed upon for calling the Pilot-coat's crew together; and immediately on intimation of a Wreck, or Vessel in distress, the Coxswain is to muster his Crew, who are to put on their Life-belts, launch the Boat, and proceed to her assistance.

"The Local Committee to report to the Institution as to the behaviour of the Boat during exercise, to point out any defect that may be remedied, and to offer any suggestions that may conduce to the efficiency of the service."

[Turn over.

[PORTABLE EDITION FOR THE POCKET.]

TREATMENT OF THE APPARENTLY DROWNED.

ROYAL NATIONAL LIFE-BOAT INSTITUTION.

Incorporated by Royal Charter—Supported solely by Voluntary Contributions.

PATRONESS—HER MOST GRACIOUS MAJESTY THE QUEEN.
VICE-PATRON—HIS ROYAL HIGHNESS THE PRINCE OF WALES, K.G.

DIRECTIONS FOR RESTORING THE APPARENTLY DROWNED.

THE leading principles of the following Directions for the Restoration of the Apparently Dead from Drowning are founded on those of the late DR. MARSHALL HALL, combined with those of DR. H. R. SILVESTER, and are the result of extensive inquiries which were made by the Institution in 1863-4 amongst Medical Men, Medical Boards, and Coroners throughout the United Kingdom. These Directions have been extensively circulated by the INSTITUTION throughout the United Kingdom and in the Colonies. They are also in use in Her Majesty's Fleet, in the Coast-guard Service, and at all the Stations of the British Army at home and abroad.

I.

SEND immediately for medical assistance, blankets, and dry clothing, but proceed to treat the Patient *instantly* on the spot, in the open air, with the face downward whether on shore or afloat; exposing the face, neck, and chest to the wind, except in severe weather, and removing all tight clothing from the neck and chest, especially the braces.

The points to be aimed at are—first and *immediately*, the RESTORATION OF BREATHING; and secondly, after breathing is restored, the PROMOTION OF WARMTH AND CIRCULATION.

The efforts to *restore Breathing* must be commenced immediately and energetically, and persevered in for one or two hours, or until a medical man has pronounced that life is extinct. Efforts to promote *Warmth* and *Circulation*, beyond removing the wet clothes and drying the skin, must not be made until the first appearance of natural breathing; for if circulation of the blood be induced before breathing has recommenced, the restoration to life will be endangered.

II.—TO RESTORE BREATHING.

TO CLEAR THE THROAT.—Place the patient on the floor or ground with the face downwards, and one of the arms under the forehead, in which position all fluids will more readily escape by the mouth, and the tongue itself will fall forward, leaving the entrance into the windpipe free. Assist this operation by wiping and cleansing the mouth.

If satisfactory breathing commences, use the treatment described below to promote Warmth. If there be only slight breathing—or no breathing—or if the breathing fail, then—

TO EXCITE BREATHING—Turn the patient well and instantly on the side, supporting the head, and

1.—INSPIRATION.

Excite the nostrils with **snuff, hartshorn, and smelling salts**, or tickle the throat with a feather, &c. if they are at hand. Rub the chest and face warm, and dash cold water, or cold and hot water alternately, on them. If there be no success, lose not a moment, but instantly—

To IMITATE BREATHING—Replace the patient on the face, raising and supporting the chest well on a folded coat or other article of dress.

Turn the body very gently on the side and a little beyond, and then briskly on the face, back again, repeating these measures cautiously, efficiently, and perseveringly, about fifteen times in the minute, or once every four or five seconds, occasionally varying the side.

[*By placing the patient on the chest, the weight of the body forces the air out; when turned on the side, this pressure is removed, and air enters the chest.*]

2.—EXPIRATION.

The foregoing two Illustrations show the position of the Body during the employment of Dr. Marshall Hall's Method of Inducing Respiration.

On each occasion that the body is replaced on the face, make uniform but efficient pressure with brisk movement, on the back between and below the shoulder-blades or bones on each side, removing the pressure immediately before turning the body on the side.

During the whole of the operations let one person attend solely to the movements of the head and of the arm placed under it.

[*The first measure increases the expiration—the second commences inspiration.*]

*** The Result is *Respiration* or *Natural Breathing*;—and if not too late, *Life*.

Whilst the above operations are being proceeded with, dry the hands and feet, and as soon as dry clothing or blankets can be procured, strip the body, and cover or gradually reclothe it, but taking care not to interfere with the efforts to restore breathing.

III.

Should these efforts not prove successful in the course of from two to five minutes, proceed to imitate breathing by DR. SILVESTER'S method, as follows:—

Place the patient on the back on a flat surface, inclined a little upwards from the feet; raise and support the head and shoulders on a small firm cushion or folded article of dress placed under the shoulder-blades.

Draw forward the patient's tongue, and keep it projecting beyond the lips: an elastic band over the tongue and under the chin will answer this purpose, or a piece of string or tape may be tied round them, or by raising the lower jaw, the teeth may be made to retain the tongue in that position. Remove all tight clothing from about the neck and chest, especially the braces.

To IMITATE THE MOVEMENTS OF BREATHING.—Standing at the patient's head, grasp the arms just above the elbows, and draw the arms gently and steadily upwards above the head, and *keep*

1.—INSPIRATION

them stretched upwards for two seconds. (*By this means air is drawn into the lungs.*) Then turn down the patient's arms, and press them gently and firmly for two seconds against the sides of the chest. (*By this means air is pressed out of the lungs.*)

Repeat these measures alternately, deliberately, and perseveringly, about fifteen times in a minute, until a spontaneous effort to respire is perceived, immediately upon which cease to imitate the movements of breathing, and proceed to INDUCE CIRCULATION AND WARMTH.

2.—EXPIRATION.

The foregoing two Illustrations show the position of the Body during the employment of Dr. Silvester's Method of inducing Respiration.

1.—TREATMENT AFTER NATURAL BREATHING HAS BEEN RESTORED.

To PROMOTE WARMTH AND CIRCULATION.—Commence rubbing the limbs upwards, with firm grasping pressure and energy, using handkerchiefs, flannels, &c. [*By this measure the blood is propelled along the veins towards the heart.*]

The friction must be continued under the blanket or over the dry clothing.

Promote the warmth of the body by the application of hot flannels, bottles, or bladders of hot water, heated bricks, &c., to the pit of the stomach, the arm-pits, between the thighs, and to the soles of the feet.

If the patient has been carried to a house after respiration has been restored, be careful to let the air play freely about the room.

On the restoration of life, a teaspoonful of warm water should be given; and then, if the power of swallowing have returned, small quantities of wine, warm brandy-and-water, or coffee should be administered. The patient should be kept in bed, and a disposition to sleep encouraged.

GENERAL OBSERVATIONS.

The above treatment should be persevered in for some hours, as it is an erroneous opinion that persons are irrecoverable because life does not soon make its appearance, persons having been restored after persevering for many hours.

APPEARANCES WHICH GENERALLY ACCOMPANY DEATH.

Breathing and the heart's action cease entirely; the eyelids are generally half closed; the pupils dilated; the tongue approaches to the under edges of the lips, and these, as well as the nostrils, are covered with a frothy mucus. Coldness and pallor of surface increase.

CAUTIONS.

Prevent unnecessary crowding of persons round the body, especially if in an apartment.

Avoid rough usage, and do not allow the body to remain on the back unless the tongue is secured.

Under no circumstances hold the body up by the feet.

On no account place the body in a warm bath unless under medical direction, and even then it should only be employed as a momentary excitant.

By order of the Committee,

RICHARD LEWIS,
Secretary.

ROYAL NATIONAL LIFE-BOAT INSTITUTION,
London, February, 1871.

*** *Large Placards of these Instructions, with Illustrations printed thereon, can be supplied by Messrs. Cloves and Sons, Printers, Charing Cross, London, at a cost little beyond the actual price of the paper on which they are printed, namely, Six Shillings per* 100 *Copies.*

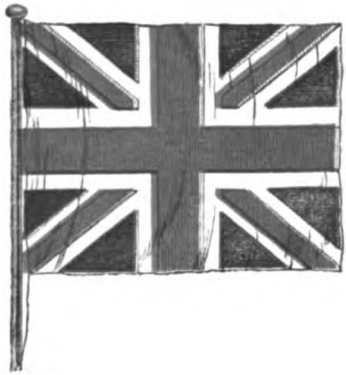
The Committee desire to acknowledge with gratitude the liberal support which they have received from the British public during the past few years, a support which has enabled them to establish their present great fleet of **226** Life-boats on the shores of the United Kingdom, and they earnestly appeal to all classes of their countrymen to continue to aid them in upholding and perpetuating so great and truly national a work.

The number of Lives saved either by the Life-boats of the Society or by special exertions for which it has granted rewards since its formation, is **19,864**; for which services **90** Gold Medals, **320** Silver Medals, and **£34,352** in cash, have been given as rewards.

The expense of a Life-boat, its Equipment, transporting-carriage, and boat-house, averages **£280**, in addition to **£50** a-year needed to keep the station in a state of efficiency.

Donations and *Annual Subscriptions* are earnestly solicited, and will be thankfully received by the Bankers of the Institution, Messrs. WILLIS, PERCIVAL, and Co., 76 Lombard Street; Messrs. COUTTS and Co., 59 Strand; Messrs. HERRIES, FARQUHAR, and Co., 16 St. James's Street, London; by all other Bankers in the United Kingdom, and by the Secretary, at the Office of the Institution, 14 JOHN STREET, ADELPHI, London, W.C.

LONDON: PRINTED BY W. CLOWES AND SONS, STAMFORD STREET AND CHARING CROSS.



BENJAMIN EDGINGTON,

By Special Appointment to Her Majesty,

2, DUKE STREET, SOUTHWARK, S.E.,

FOOT OF LONDON BRIDGE.

FLAGS OF ALL NATIONS

IN SILK OR BUNTING,

WITH ARMS, DEVICES, MOTTOES, & INSCRIPTIONS TO ORDER.

MANUFACTURER OF THE

COMMERCIAL CODE OF SIGNAL FLAGS.

THE ENGLISH GOVERNMENT having ordered that no other Code be used in the Navy, and no Signals but those of the COMMERCIAL CODE be recognised at the different Colonial Stations; Shipowners are recommended to adopt them. They are favourably noticed by the *Committee of Lloyd's*, and adopted by the following Governments, viz.:—America, France, Prussia, Russia, Austria, Italy, Holland, Spain, Portugal, Sweden, Denmark, Greece, Brazil, etc.

B. EDGINGTON keeps COMPLETE SETS of Flags on hand of the following standard sizes:—

The Set of 19 Flags in Bag.

	Small Size.	Medium.	Large.
SIZES OF FLAGS ...	6 by 4½ feet	... 7 by 5 feet	... 8 by 6 feet.
PENDANT	3 by 11 feet	... 4 by 13 feet	... 5 by 15 feet.

They supply the EXTRA FLAGS to adapt MARRYAT'S to this Code; and Ships not Carrying either Code, but desirous of reporting their OFFICIAL NUMBER, can have the FOUR FLAGS for that purpose.

ENSIGNS, UNION JACKS, & MARRYAT'S SIGNALS KEPT IN STOCK.

HOUSE AND OTHER FLAGS MADE TO ORDER.

BENJAMIN EDGINGTON

ADDRESS—

2, Duke St., London Bridge, S.E., & Stand at Mark Lane.

NO OTHER ESTABLISHMENT.

Holmes' Patent Inextinguishable Self-Igniting,

MARINE AND DANGER

SIGNAL LIGHT,

WILL CONTINUE BURNING FOR OVER 40 MINUTES.

Attention is directed to this New Signal Light, which burns with immense power and brilliancy.

The Light is free from danger, is non-explosive, and it is not affected by heat.

The steady flare produced may be seen for a great distance in the open air, and the Light will continue to burn for over 40 minutes.

It may be employed with advantage in cases of SHIPWRECK, LIFE BUOY RESCUES, ROCKET LINE APPARATUS, SHIP SIGNALS, SALVAGES, TIDE AND HARBOUR WARNINGS, LIFE-BOAT SERVICES, RAILWAY ACCIDENTS, TELEGRAPH WORK AND SUBMARINE CABLE REPAIRS, and whenever a Brilliant Signal Light is required.

The Light instantaneously ignites on contact with water.

The Light CANNOT BE EXTINGUISHED BY EITHER WIND OR WATER; it is comparatively inexpensive, and of great simplicity.

The Signal Light can now be supplied in quantity, either for use as a Floating Light, or a Stationary Signal.

Packed in cases containing *Ten* Lights each case, price Sixty Shillings.

All communications to be addressed to NATHL. J. HOLMES, 7, Great Winchester Street Buildings, Old Broad Street, London.

ANTI-FOULING COMPOSITION.

ORDERED FOR USE BY THE HON. BOARD OF ADMIRALTY, AFTER LONG AND SUCCESSFUL TRIAL.

PATRONIZED BY A NUMBER OF
LEADING SHIPOWNERS AT HOME AND ABROAD.

Iron Ships protected from Fouling, Wooden Vessels kept clean, Sheathing preserved, and adhesion of Shell Fish and Weed at same time prevented.

FOR PARTICULARS APPLY TO

THE BRITISH AND ORIENTAL SHIP COATING COMPANY,

GRANGE, EDINBURGH.

OR TO ANY OF THEIR AGENTS IN MOST OF THE IMPORTANT PORTS OF THE WORLD.

TO MERCHANTS, CAPTAINS, AND OTHERS.

UNDER THE Patronage of Royalty,

AND THE Aristocracy of Europe.

These Preparations are universally held in high estimation, and the fact of the distinguished patronage they enjoy, their general use in all Countries, and the numerous testimonials constantly received of their efficacy, sufficiently proves their value, and renders them well worthy the attention of MERCHANTS and SHIPPERS.

ROWLANDS' MACASSAR OIL

POSSESSES EXTRAORDINARY PROPERTIES FOR PROMOTING THE GROWTH, RESTORING AND BEAUTIFYING THE HUMAN HAIR.

It prevents Hair from falling off or turning grey, strengthens weak HAIR, cleanses it from Scurf and Dandriff, and makes it BEAUTIFULLY SOFT, PLIABLE, and GLOSSY. In the Growth of

THE BEARD, WHISKERS, AND MOUSTACHIOS,

it is unfailing in its stimulative operation. For CHILDREN it is especially recommended as forming the basis of A BEAUTIFUL HEAD OF HAIR. Price 3s. 6d., 7s., 10s. 6d. (equal to four small), and 21s. per bottle.

ROWLANDS' KALYDOR,

AN ORIENTAL BOTANICAL PREPARATION FOR

IMPROVING AND BEAUTIFYING THE COMPLEXION AND SKIN.

This Royally-patronized and Ladies'-esteemed Specific exerts the most soothing, cooling, and purifying action on the skin, eradicates *Freckles, Tan, Pimples, Spots, Discoloration,* and other *Cutaneous Visitations,* and renders

THE SKIN SOFT, CLEAR, AND BLOOMING.

Price 4s. 6d. and 8s. 6d. per bottle.

WHITE AND SOUND TEETH

Are indispensable to PERSONAL ATTRACTION, and to health and longevity by the proper mastication of food.

ROWLANDS' ODONTO,

OR PEARL DENTIFRICE.

Compounded of ORIENTAL INGREDIENTS, is of inestimable value in PRESERVING and BEAUTIFYING the TEETH, STRENGTHENING the GUMS, and in imparting a DELICATE FRAGRANCE to the BREATH. It eradicates Tartar from the Teeth, removes spots of incipient decay, and polishes and preserves the enamel, to which it imparts a PEARL-LIKE WHITENESS. Price 2s. 9d. per box.

Sold at 20, *Hatton Garden, London, and by Chemists and Perfumers.*

Ask for "ROWLANDS'" Articles.

London: Printed for the Proprietor by JAMES MARTIN, 9, Lisson Grove, in the Parish of St. Marylebone, N.W.—December 1st, 1871.