

INSTITUTE OF MARINE ENGINEERS INCORPORATED.

SESSION



1913-14.

President : THOMAS L. DEVITT, Esq.

The President's Address.

Monday, November 3, 1913.

I am sensible of the honour conferred upon me in being elected President of the Institute of Marine Engineers. To be President of a Society so thoroughly representative of marine transportation is to me a source of gratification and pride; also to be associated in this connection with those who have occupied this Chair before me, men distinguished in science, in the practical arts, and in commerce. I ask the members of this Institution to accept my thanks for inscribing mine on a page already bright with so many illustrious names.

I am not an engineer, and it would be quite out of place, if, in this address I should attempt to deal with subjects on which I cannot pretend to be an authority. But I know the value of this Institution, and I am sensible of the importance of its work. As a shipowner whose experience began in the days when brigs, barques, frigate-built ships, Aberdeen clippers, American vessels of large tonnage and fine models, and those beautiful China clippers which to my mind represent the perfection of naval architecture, I look back with a sort of regret at the disappearance of the sailing vessel; but even now when it is almost impossible for sailing ships to compete with steamers, I think it is beyond contradiction that the real seamen of to-day are those who have been qualified for their present positions in steamships by a training in sailing vessels; they are resourceful and competent in a way that those reared in steamers can never become.

I know that shipowners must move with the times or be left behind, and how essential it is for them to take advantage of every improvement and development in machinery for propulsion of ships and of every invention of the engineers, when proved to be sound, so that they may be able to hold their own in the severe competition for the world's traffic on the sea.

My only excuse for accepting the great position which you have given me is that I think I have known how to use the vessels which have been built during the last half century, whether small cargo carriers or large passenger ships, and by association with others in these later times have kept to the front and am now assisting to manage a fleet of steamships in my own old trade to and from Australia, which in every respect is equal to, if not in advance of, all our competitors. But it would have been impossible for my colleagues and myself to have accomplished what we have done without the Marine Engineers, to say nothing of the Naval Architects, so without presuming to discuss engines and engineers, I think I can make out a good case for the existence of intelligent, enterprising Shipowners.

Of course, the days of private shipowning are over. Very few in the present day can own a fleet of steamers, but by combination of interests and with some support of the capitalist, intelligent managers can originate and carry on business, giving employment to shipbuilders and their workmen, engineers and theirs, sailors and firemen, and hosts of others on shore and afloat, to the advantage of all concerned.

Engineers, more than any others, depend on the harmonious working of their machines, each part depending on other parts, and if anything is out of order the whole construction may be at once made useless. I wish we could apply this principle to our relation one to another as employers and employed, so that there shall be "no schism in the body." If every part of the machine works properly, so that every one taking any part in the building, the managing, the working of ships and machinery, should work for a common end and try to make a success of the joint adventure, an excellent result is attained.

I am convinced that if this spirit could be encouraged, instead of setting class against class, and making trouble instead of harmonising difficulties, we should all prosper more than we do. None of us can do without the capitalist any more than we can do without the skilled workman. Working together with the aid of capital, shipowners, engineers, shipmasters, and sailors generally can make a success. But I have

wandered somewhat from my subject, and I must make reference to some of the developments that have taken place in my time.

In 1854, the year I began business as a lad in my father's office, there were seven or eight steamship lines running between Liverpool and New York.

My friend Dr. Thearle told me that in the year 1827 there were 80 steam vessels classed in the register book, and in 1832 there were 100, and I find that in those early days steam vessels had to be surveyed twice in every year.

In 1840 the log book of the Cunard steamer *Britannia* contained the following entry:—"Broke the larboard steam pipe, lapped it with canvas and rope yarn, and proceeded with low pressure." We have made some progress from that state of affairs.

The *Great Britain* had been launched in 1843, and after a somewhat eventful career had been placed in the Australian trade at the time of the gold fever, and thereafter for many years sailed regularly between England and Australia. Her dimensions were 320ft. overall x 51 x 31ft. 4ins., and she was described in the public prints of the time as "*a stupendous steamship of unparalleled vastness.*"

I find the following advertisement issued by the owners in 1852:—

"The *Great Britain*, 3,500 tons and 500 H.P., B. R. Matthews, R.N. Commander, will be despatched for Melbourne and Sydney, N.S.W., calling at the Cape of Good Hope for coals, water and fresh provision on Saturday, 21st August, 1852, at 1 p.m. This magnificent vessel, fitted up with every possible convenience, has just performed her trial voyage to New York in the most satisfactory manner."

The engines of the *Great Britain* had been renewed, and were then of the oscillating type, made by J. Penn and Son, of Greenwich, the cylinders being 82½ins. diameter, and the stroke 6ft. The screw propeller was three bladed, 15ft. 6ins. in diameter, and 19ft. pitch, and by the use of gearing, made three revolutions to one of the engine. There were no less than six boilers on board, and her coal capacity was about 1,200 tons. It is pleasant to know that her first voyage was highly successful, 600 passengers being carried, and the machinery working splendidly the whole of the time.

Another notable steamer of that early time was the *Royal Charter*, 235ft. in length, and built for the same owners as the *Great Britain*. The *Royal Charter* was the product of a belief then widely held by Shipowners, and shared by not a few engineers, that vessels relying on steam power alone would never be economically employed in long voyages, and that the ship of the future, which should combine the best qualities of both types, would be the full rigged ship fitted with auxiliary steam engines. At the particular stage of development which had been attained, this was not an unreasonable opinion, and as a matter of fact in 1856 the Cape and Indian Mails were carried in auxiliary steamers with a speed under sail of 10-11 knots and under steam, in calms, of 6-7 knots. The *Royal Charter* was such a vessel. She had a pair of direct acting trunk engines, by Penn, of Greenwich, developing 200 nominal H.P. working an auxiliary screw which could be lifted out of the water and placed on deck. She could also spread 15,000 square feet of canvas, and on her trial trip under canvas only, and in a light wind, she did 14 knots, and under steam, 9 knots. This vessel made her maiden voyage to Melbourne in 59 days, but she had a short life and a tragic end. Three years later she was wrecked on the Welsh Coast.

If I were asked to state the impression left upon me from these early recollections of the beginning of steam navigation as we know it, I should have no difficulty in replying. I should say it was the spirit of enterprise that then existed among shipbuilders and engineers, the passion for experiment, the desire to tread unknown paths, to undertake projects, the magnitude of which seemed out of all proportion to the means available for their execution. Certainly, there was no such word as "fail." Then was the zenith of Thames shipbuilding. Mare's Yard at Blackwall, afterwards the Thames Ironworks, was one of the principal yards of the world. The wages of workmen at Blackwall averaged for 18 months £5,000 per week, and some weeks £1,600 more. The yards of Messrs. Green, Scott Russell, Dudgeon, Maudslay, Samuda, and many others, employed thousands of hands. It was the dawn of a new era, and the spirit of enterprise was in the air. The chief evidence of this spirit, as exhibited in both engineers and shipbuilders, was, I think, the building of the *Great Eastern*. That great vessel, the construction of which was actually commenced by Mr. Scott Russell on the 1st May, 1854, was not only far and away the largest vessel up to that time, but remained the largest up to the end of the 19th century. I think

you will agree that not only as regards her size, but taking account also of the appliances then available, and the novelty of the principle embodied in her construction, she provides an arresting illustration of the initiative and courage of the pioneer builders of ships. It is quite true, that so far as monetary results are concerned she was a failure—except to those who broke her up.

The *Great Eastern*, however, reflects the courage and enterprise of the shipbuilder and not less so the same qualities in the Marine Engineer. Let me give you another example, however, which applies strictly to your own profession. I find in an old issue of *Engineering* this reference to the achievement of one of the most prominent of pioneer marine engineering firms, the son of the founder of which, Dr. Inglis, is a member and past President of this Institution:—

“ In 1855 a contract was entered into with a degree of
 “ boldness which only complete success could have justified. This was for the steamer *Tasmanian*, for the
 “ European and Australian Steam Navigation Co. The
 “ machinery, of over 3,000 H.P. was at that time considered of the largest size, and to undertake the erection
 “ of it in a little wooden shop, barely 20ft. high and
 “ furnished with a 15-ton crane, was almost heroic. The
 “ sole plate of this set of engines weighed 40 tons, and
 “ had to be lowered with screw jacks into a pit dug out to
 “ give height under the travelling crane. Messrs. Inglis
 “ actually built up the crank shaft, working the material
 “ in the smithy. The *Tasmanian* proved one of the
 “ fastest screw steamers built up to that time, having
 “ easily attained the speed of $14\frac{1}{2}$ knots at Stokes Bay.
 “ Her consumption of coal, about 3lbs. per I.H.P. per
 “ hour, was for that day extremely moderate. The engines
 “ were constructed with three cylinders, had a built crank
 “ shaft, valves at the side, variable expansion, steam reversing gear, a built propeller, and other improvements.
 “ They worked most successfully until the general adoption
 “ of compound engines made so many admirable contrivances obsolete.”

In spite of this enterprise, courage and resource, however, our sailing vessels, considered as the more important part of our Mercantile Marine, took an unconscionable time in dying. About the time of which I speak we were regaining that pre-eminence in the design of clipper ships which had been wrested

from us by the Americans, as much by their freedom from convention in design as by the impetus given to their shipbuilding industry, due to their plentiful supply of timber. In the China trade, Messrs. Green of Blackwall, took up the transatlantic gage, built the *Challenger* to race the American *Challenge* and won. Messrs. Scott's *Lord of the Isles*, an iron ship, beat two of the fastest American clippers of double her size. One still remembers the popular excitement engendered by these races—a species of America Cup contest on a vaster scale. In the Australian trade, with which I have been connected all my life, the bulk of the passenger and cargo traffic continued to be carried in sailing vessels for many years. Amongst the first of these I recollect the *Vimiera*, a ship of 1,000 tons built in Sunderland for Mr. Duncan Dunbar of London, and the *Copenhagen*, a teak ship of 878 tons built at Moulmein. The *Copenhagen* was thought to have done very well in her day in having her poop full of passengers with some in 'tween decks, and in carrying on one voyage, that I well remember, in addition to stock for the ship's use, 15 horses, 17 bulls, and 68 sheep for breeding purposes in Australia. Amongst the last of the fast sailers is the Aberdeen clipper ship *Thermopylae*, which in 1868 did the voyage from London to Melbourne in 60 days.

The opening of the Suez Canal completely transformed the conditions of ocean transport, and has since entirely reversed the proportion of sailing and steamer tonnage. The principal passenger lines which brought about this state of affairs were the P. and O.S.N. Coy. and the Orient S.N. Coy., with the latter of which I am connected.

In 1869—eight years prior to the formation of the Orient Company, Messrs. Robt. Napier and Sons (whose General Manager was the late Mr. afterwards Sir William Pearce, and their Chief Engineer Constructor, Mr. Brock) built for Messrs. Devitt and Moore the iron screw steamer *Queen of the Thames*, one of the first to be fitted with compound engines, and which made the voyage to Melbourne in 48 days. After the formation of the Orient Company in 1877, monthly services to Australia were undertaken, then fortnightly in co-operation with the Pacific Steam Navigation Co. Our earliest vessels in this service were the *Cuzco*, *Garonne*, *Chimborazo*, and *Lusitania*. These were 380ft. in length, having compound engines, the diameters of cylinders being 60" and 104" with a stroke of 4ft. Boiler pressure was about 60lbs. per square inch. In 1879 we built the *Orient*, 445ft. in length, and in 1881 the

Austral, 456ft. The *Orient*, an iron vessel, was a most satisfactory steamer, and at the time was considered to be one of the largest and finest afloat. She remained in active service for 30 years.

Since that time the science of Marine Engineering has never looked back. The members of this Institution are intimately acquainted with each forward step which has been made, and, as I have said, I have followed each one with interest and appreciation. We have seen the advent of surface condensation and successive application of the principle in the adoption of compound, triple and quadruple expansion engines. Boiler pressures, which in 1880 were 80 lbs. per square inch, are now 220 lbs. per square inch; and coal consumption which was then $2\frac{1}{2}$ lbs. per I.H.P. per hour is now $1\frac{1}{2}$ lbs. per I.H.P. per hour and less.

Even now, after the long experience of steam and the abandonment of the idea of auxiliary steam power in sailing ships, there are sailing vessels being built of large capacity with Diesel Engines to propel them in calms and adverse winds. We shall hear before long whether these are a success or not. If you have not already done so I would advise you to read my friend, Mr. Gracie's paper which he delivered at the Institution of Civil Engineers on 23rd October, in which the following interesting paragraphs appear:—

- (1) "The speed (the lecturer is referring to the twenty years' progress evidenced in the vessels of a well-known line of cargo tramps) has remained practically constant at 11 knots; but while the 6,400 ton deadweight carrier of 1895 developed 1,400 indicated horse-power, and consumed 24 tons of coal daily, her successor of to-day can carry 9,600 tons and steam at the same speed on an expenditure of only 32 tons daily for 2,300 indicated horse-power. Fifty per cent. more deadweight is carried, and 64 per cent. more power developed, but only 33 per cent. has been added to the fuel consumed. The coal rate has fallen from 1.6lb. per horse-power per hour to 1.3lb., while for a 3,000 mile voyage the deadweight carried per ton of coal has increased from 23.5 tons to 26.4 tons."
- (2) "In the course of my remarks I have made no reference to failures, as these have been but rare among so many notable successes. Nevertheless, much has been learned from failure, as each one, if read aright, indi-

“cates something to be avoided in future work. The
“solid progress recorded, with but little assistance from
“that manual labour which to-day claims to be the sole
“producer of wealth, has been the inevitable result of
“the persistent intellectual effort, amounting at times to
“genius, of the many men whose names are as household
“words among us, and will live imperishably in the
“annals of our profession.”

I wish I could have given you a more interesting account of my recollections of the rise and development of marine engines, but you know so much more about the subject than I do, that you will perhaps pardon my omissions and will believe that shipowners and the public generally value most highly the great work of the Marine Engineer.

I trust that the new building, the corner stone of which was laid on Wednesday by the Lord Mayor of London, will be the meeting place of many generations of engineers, where they can discuss their problems and help one another to perfect their machinery for the benefit of themselves and the world at large.



Presentation of Awards.

The Denny Gold Medal for session 1912-13 was then presented to Mr. Jas. E. Milton for the paper on “The Spontaneous Combustion of Coal,” read before the Institute on January 20th, 1913. In presenting the medal Mr. DEVITT said:

I have pleasure in handing you this medal and in wishing you a very bright career. You have something to live up to: your father has distinguished himself in his profession and I trust you will do your best to achieve the high success which he has attained.

Mr. J. E. MILTON: I wish to express my deep appreciation of the high honour which the Institute has conferred upon me, and also to thank you for the very kindly way in which you have presented it.

ESSAY COMPETITIONS.

The results of the Essay Competitions were then announced as follows:—

Associate Members.—“The Economic Use of Coal on Board the Modern Steamship.” Prize of £2 awarded to Mr. Walter Smith.

Graduates.—“The Safety Devices required in a Modern Marine Boiler and Machinery Installation.” Prize of £2 awarded to Mr. Jas. Marsden.

Open Competition.—“The Welding of Iron and Steel; Past and Present Methods.”

Prize of £2. Mr. Thomas E. Dodds (Graduate).

Prize of £2. Mr. R. J. Walker (Graduate).

Prize of £1. Mr. G. A. Murray Brown (Graduate).

Prize of £1. Mr. Wm. Auchinloss.

Messrs. The Darlington Forge Co., Ltd., very kindly gave a donation of £3 towards the prize fund in connection with the above.

Mr. Walter Smith and M. Thomas E. Dodds attended to receive their prizes.

LLOYD'S REGISTER SCHOLARSHIPS.

Mr. DEVITT: The Lloyd's Register Scholarship of £50 per annum, tenable for two years, was awarded this session to Mr. G. A. Murray Brown (Graduate), apprentice engineer with Messrs. D. Rowan and Co., Ltd., of Glasgow, and he has commenced his studies at Glasgow University. In view of the excellence of the papers submitted, the Committee of Lloyd's Register also awarded premiums of the value of £5 and £3 respectively to Mr. Thomas E. Dodds (Graduate) of Dunston-on-Tyne and to Mr. Robt. J. Walker (Graduate) of Glasgow. I need hardly tell you, gentlemen, what a pleasure it is to the Committee of Lloyd's Register to present these prizes. In doing so they have one object in view, to encourage young men to come to the front. The better the man, the better his position will be in the future, and if the Committee of Lloyd's Register can help in any way I can assure you they are most willing to do it.

Mr. A. BOYLE: I have great pleasure in asking you to accord a hearty vote of thanks to our President, Mr. Devitt, not only for his address this evening, but for the great interest he has taken in the welfare and progress of the Institute during his year of office. The address of a President of the In-

stitute is, of course, above and beyond criticism, but the address Mr. Devitt has given this evening, and which I am sure we all appreciate very much, is not only of great interest, but it contains some very wise words which we should do well to ponder over. The services which Mr. Devitt has rendered to this Institute have been very valuable indeed. The very gratifying success of the important ceremony of laying the Foundation Stone of the new premises on Wednesday last was in no small measure due to the great interest displayed by Mr. Devitt. That day was a red-letter day in the history of this Institute. The presence of the Lord Mayor of London in State, the number of distinguished gentlemen present, and the happy thought of bringing the boys and girls from the Royal Merchant Seamen's Orphanage to take part in the ceremony, all contributed in making the occasion a memorable one, and I am sure Mr. Devitt himself will be gratified at the great success of the proceedings. I have only one word more to say and that is that this Institute, as an Institute, is greatly indebted to the Society of Lloyd's Register. Several of our members are connected with that Society, and we have had the advantage of having papers read by them on more than one occasion. To-night we have seen with the greatest pleasure one of their number receiving the highest honour we can give for reading a paper before the Institute. In addition to being indebted to Lloyd's Register for what the members connected with it have done, we are also indebted to the Committee and Chairman of Lloyd's Register for enhancing the value of the Institute to our members, especially to the younger members, by the very handsome gift of two scholarships, which, I am sure, no words of mine are needed to emphasize. I ask you to accept and support this very hearty vote of thanks to our esteemed President, Mr. Devitt, for the great work he has done for the advancement of this Institute, and also for the trouble he has taken in coming down this evening to give us this address which we have listened to with so much pleasure.

Mr. R. LESLIE, R.N.R.: It affords me a great amount of pleasure to second this vote of thanks, as it is more than fully deserved, because Mr. Devitt, from his earliest years, has seen what the engineers have been in the past, and he also knows what they are now, and fully appreciates the value of the engineer and the good work done by him. The great corporation over which Mr. Devitt presides is an intensely practical one in all that it does. The scholarships they give are not only an inducement to the young men to study, but they are

a very practical inducement, and with such encouragement the young men would be very dense if they did not accept such opportunities. I am very pleased to see that the young men at the present time are taking a great interest in the scholarships and prizes, and I hope that in the new building which is now being erected on Tower Hill there will be even greater impetus to work of this kind. The engineer expects to be well paid, but he must give something in return, he must give good results for the wages he gets. I have much pleasure in seconding this vote of thanks to our President.

MR. J. HALLETT: Before Mr. Devitt replies, I should like to supplement what has already been said, and I should also like to say that the presence of the boys and girls from the Merchant Seamen's Orphanage at the Foundation Stone ceremony was entirely due to Mr. Devitt, and it is not the least item of good work he has done for the Institute. It will be gratifying for him to know, because I know he takes a very practical interest in this Orphanage, that many gentlemen have called on me to express the pleasure they had in seeing the children, who, they thought, looked splendid. It will also be gratifying to the members who have contributed towards the *Titanic* Engineering Staff Memorial Fund to know that part of the money will be utilised in this Orphanage for the benefit of the orphans of marine engineers.

MR. DEVITT: I thank you very much for your kind expression of appreciation of the small things I have done. I am only sorry that in my year of office I have had little work to do at all. Not many years ago one of my colleagues said we managers ought to know about engineering. I said: "I don't know. A little knowledge is a very dangerous thing." I think if we know what to do with the ships and attend to that part of the business, it will be sufficient to get the best men to work them for us. I do not want to be quite ignorant about these things, but it would be quite impossible for a man who has to see about how the ships are to be employed, who has to deal with questions of freight and passengers and to manage things generally, to give a great deal of attention to the machinery. He may be intensely interested in it, but he has not the time to devote himself to it thoroughly. As far as the Seamen's Orphanage is concerned, I happen to be Chairman of that Institution, and I thought it would be a good advertisement to have the boys and girls at the ceremony, to show the public generally what is being

done, and I believe everybody appreciated it. If any of you can come to Snaresbrook and see the ideal way in which the Orphanage is conducted you would be extremely gratified. I am very pleased and proud to have been connected with the Orphanage for the last half-century, and my father before me was also deeply interested in it. I want it to prosper. We try to get all shipowners to give a guinea a year for every ship they possess, but we have not been quite successful. Shipowners in the North sometimes send the children of their seamen and do not send the subscription. Of course in some instances they have local institutions. Liverpool supports her own Orphanage nobly; at the same time there are Liverpool children in the Orphanage at Snaresbrook. Lloyd's Register has been mentioned. We want to get the best men to the front. There are 350 surveyors all over the world, and I hope that young men will offer themselves to us from time to time. The work is growing each year, and I think you will be interested, as well as the Committee, in seeing the Society expand. I have now only to thank you very much for the way in which you have received me, and I wish the Institute every possible success.