INSTITUTE OF MARINE ENGINEERS

INCORPORATED.

SESSION 1898-9.

BRISTOL CHANNEL CENTRE.

President—Professor ELLIOTT, D.Sc.

ANNUAL DINNER.

THE Eighth Annual Dinner of the Bristol Channel Centre was held at the Royal Hotel, Cardiff, on October 29. The President (Professor Elliott, D.Sc.) was supported by Sir E. J. Reed, K.C.B., F.R.S., Mr. E. T. Reed, the Mayor of Cardiff (Alderman J. Ramsdale, J.P.), Rev. Canon Thompson, D.D. (Vicar of Cardiff), Mr. Llewellen Wood, J.P., Mr. Lester Jones (President Cardiff Chamber of Commerce), Mr. T. E. Watson, J.P., Mr. Henry K. Jordan, F.G.S. (President of the South Wales Institute of Engineers), Mr. John Duncan, J.P., Dr. J. Ll. Treharne, J.P., Mr. Charles Heywood, Dr. T. Wallace, J.P., Rev. J. Baker, M.A., Captain T. N. Rosser (Dockmaster, Cardiff), Mr. A. Mawson (Chairman Cardiff Shipowners' Association), Mr. C. B. Fowler, F.R.I.B.A. (President of the South Wales Architects' Society), Mr. T. J. Leaning (District Superintendent Great Western Railway), Mr. A.

Havelock-Case (Engineer-in-charge, Port Talbot Docks), and Messrs. D. Gibson, M. W. Aisbitt, and T. W. Wailes (Vice-Presidents), T. A. Reed (Council Representative), A. E. Smithson (Hon. Treas.), George Sloggett (Hon. Sec.), J. F. Walliker (Committee), Captain Johnson (Principal Officer, Board of Trade), Mr. E. Handcock, Jun., Captain T. H. Sloggett, M.I.N.A., Mr. J. A. Jenkins, B.A. (Registrar, University College), and Mr. W. Hawkins (Sec. Cardiff Chamber of Commerce).

The loyal toasts having been duly honoured at the invitation of the President,

The Rev. Canon THOMPSON, D.D., proposed "Our First Line of Defence." He said he was told, when he came into the hotel, that some friends had been criticising him for allowing himself to propose such a toast. Well, he pitied their want of insight. No one would suppose for a moment that because the toast was put in that particular form any disparagement was meant to our glorious Army or to the Reserve Forces of the land. For the sake of convenience, they were all gathered up into one. To-night "the Navy" included the Army and Reserve Forces, as it were, and had swallowed up—he was delighted to see—"the Bishops and Clergy, and Ministers of all denominations." It would, indeed, be a mistake for anyone to suppose they were unmindful of the Army, especially to-day. It was sometimes said, that although England was a great naval Power—the greatest the world had ever seen—yet that she was not a great military Power. But Britain's military power was great, even in point of numbers, because we had about a million of men all told in all parts of the world; and if we reckoned her military prowess by the deeds her arms had done she was the greatest military Power the world had ever seen. We had only to think of Marlborough, Wolfe, Wellington, and those glorious Indian chieftains Wolseley and Roberts, and, lastly, the liberator of the Soudan, Lord Kitchener of Khartoum, to con-

firm this. Nor was he going to allow the Reserve Forces to sink into unmerited oblivion. He had the honour of wearing Her Majesty's uniform and—whenever he felt inclined to sport it—the volunteer medal for long and meritorious service. But, of course, it was undeniable that the Navy must always be our striking arm in case of need. It must always be on the sea that England and her possessions would be defended, if they were to be successfully defended at all. The other day, when he visited the squadron in the Cardiff Roads, and boarded the Admiral's flagship, the *Sanspareil*, he was deeply impressed with the marvellous amount of potent power upon that single ship; but what struck him more than anything else was the manly tone, the gentlemanly conduct, the self-suppression, the courteous chivalry of all the men belonging to the ship, from the chief officer to the lowest sailor. He was going to couple with the toast a name well known, not merely in Cardiff and England, but a name that had a European reputation. It was as distinguished a thing to be one of the creators of the Navy as to be one of its illustrious fighters, and Sir Edward Reed could fairly claim this title. The first time he made Sir Edward's acquaintance was some thirty-three years ago. They were dining together at a friend's house, and Sir Edward was then engaged designing, not a vessel of war but one designed for the protection of missionary enterprise. He was telling them round the dinner table about the construction of a certain steel ship which—if his memory served—was to be used by David Livingstone, of immortal memory, on the Lake Tanganyka. What Sir Edward Reed was doing then was not in the least degree incompatible with what he had done since. The man who was prepared to defend his native land, whatever be his profession in life, was doing not only a patriotic and courageous but a religious duty. There could not be anything contradictory between defensive warfare and the most peaceful and harmless of civil pursuits. He coupled

with the toast the name of Sir Edward Reed, whom they all liked to see in Cardiff, and whom they would like to see oftener in Cardiff than had been the case in the past few years. Sir Edward was one who had conferred great benefits upon the interests of Cardiff, and Cardiff people would never forget it. During the fifteen years he sat for Cardiff, Sir Edward Reed was a model member, and preeminently fitted to be the member for such a great mercantile industrial and commercial community.

Sir Edward Reed was greeted with loud applause on rising to acknowledge the toast. He said he was not sorry that the first opportunity he had been able to find of visiting Cardiff for nearly 3½ years should have been in connection with the great naval service of this country—a service with which he had been more or less intimately associated all his life. There was a time when it was wholly unusual, and by most people deemed improper, for a civilian associated with the Navy to respond for the naval service. For his part, he did not complain that that feeling existed, because in those days all ships were substantially alike, and the merit lay not at all in the designers of the ships but in the fighting of them, and therefore it was most proper in those days that the officers and men of the naval service should receive first and only consideration upon social occasions like the present. There was another reason why they could not have expected to see the names of constructors associated in the toast of the Navy. A century ago we were able to do what we could not do to-day; we were able to capture from the French better ships than we ourselves possessed. It was a fact that in the great war at the end of the last and the beginning of the present century all the best types of line-of-battle ships were captured from the French and imitated in our dockyards. But the French lay under the disadvantage that, while they were preeminent in theory they were not gifted with the practical qualities which enabled them to put ships together with the strength that the sea made imperative.

In those days the French ships could not be launched; they had to be built in dry dock because they might have broken to pieces in launching. All that had passed away, and we lived in a new era. In these days the naval designer and the marine engineer had to put their best ability and skill into the construction of Her Majesty's ships, otherwise the country would be left in an unfortunate position. In his opinion it was a shameful fact, and one against which he had protested for many a long year, that the men who were required to work the whole machinery, the whole fighting elements, of Her Majesty's ships, were not deemed worthy of being executive officers of the Navy. He ventured to say the time was coming, and the time was near, when the men who had to work the whole of the fighting machinery of the ship, who are responsible for the mobility of the ship, for her speed, for the efficiency of the 30 or 40 engines which entered into the composition and operation of the modern battleship, would be recognised amongst the fighting officers and men of the British Navy, and would receive that honour and distinction in that respect which the United States Government had recently, and very properly, accorded to the marine engineers of the United States Navy. He felt some confidence, therefore, that he was not doing an improper thing, at a gathering of the Institute of Marine Engineers, in rising to respond for the naval service of the country. Looking to the extraordinary political situation, a considerable interest was manifested as to our naval position and strength, and he was not sorry to have an opportunity of saying a word or two upon the subject. Many a time, in Cardiff, he had to criticise and complain of Her Majesty's ships, of certain features of their design, which he thought to be bad and dangerous. He was happy to tell them that for many years past those objections had not been repeated in any British battleship at all, and although the ships which he had thought to be defective as fighting vessels still existed, they were relegated to minor services, and we had now

a Navy of the first class, to which only hypercritical people could justly take exception. In the days when he had to complain, it was sometimes said—"How is it you can see such grave defects in certain of our ships, and you never see any defects in any French or other foreign ships." His answer was—"Don't be too hasty. You should not say I don't see any defects in foreign ships: I don't talk about them." As a matter of fact, the French Navy had bad defects of a very grave kind. One of these was, with regard to many of their ships, a large measure of instability which, from time to time, had driven the Government of France to many resorts with a view to remedy the defect. Many critical considerations entered into the design of warships of to-day. In the case of H.M. *Captain*, which was lost, the First Lord of the Admiralty told him, replying to his alarms about her, that the Navy officers considered her the best ship in H.M. Navy, and that he himself so considered her. Not very long afterwards he (Sir Edward) had retired from the Admiralty, and the ship capsized from the cause that was foreseen—fully and clearly foreseen—and took 600 souls to the bottom. She had the fatal defect of too low a side for a ship carrying a press of canvas. That class of danger did not now exist, because we did not sail any battleships. But there entered into designs many other considerations, which it would be improper for him on that occasion to detail. It would, however, be interesting for them to know that, in his opinion, we had a Navy vastly superior in numbers to the French, and of much superior qualities. Of late years, there had been built a whole series of ships—very large battleships—from which had been excluded, so far as he could judge, every fatal element—not every dangerous element—because we could not put these giant vessels afloat to fight each other without incurring multifarious risks. The sea battle of to-day was a question of so many minutes. When a British squadron got alongside a foreign fleet, the fight would almost be decided by the first discharge of the artillery of the more powerful

ships. He did not know why, but it had been the fancy of all governments to leave large portions of the upper structure of the vessel, and what that structure contained, exposed to destructive fire. Simultaneously there had arisen the quick-firing gun, and the gun which could be directed by machinery with the most deadly aim, even by an ordinary person if the range were not too great. The consequence would be, in his opinion, that these unprotected upper works and their contents would be set on fire, and practically destroyed, and the ship silenced, at the first round or two by the more effective ship with the quick-firing guns properly handled. He was glad to be able to say that the novelty, the complexity, and the difficulty of fighting the machine-armed battleship of to-day had been wonderfully well mastered by the officers and men of the naval service. He did not know any phenomenon of our public life more striking or more gratifying than the skill and determination with which the officers and men of the naval service, discarding the old times with its abundance of tackle aloft, when a network of ropes and lines absorbed the attention of officers and men at sea, had devoted themselves to the teeming mass of complexities on board the modern man-of-war—complexities that might have appalled any class of men not made of the right metal. He believed our Navy was never so efficient, speaking comparatively with other navies, as it was at the present time. The only blot in it was that to which he had already referred, that we had not arrived at the time when the marine engineer and his staff were considered worthy to rank with the fighting officers and men of the naval service. The fact was, the Navy was governed by a board of politicians and Navy officers of the executive class. But both politicians and executive Navy officers devoted themselves conscientiously to the national interests of the country. Mr. Goschen had signalised his term of office by pressing to completion all those manifold arrangements which

were indispensable to the efficiency and quick mobilising of the Navy in a time of hostilities, and the country need not mistake the tranquillity which prevailed at the Admiralty and at the dockyards as an indication of indifference to the state of things. The Intelligence Department of the Admiralty was managed in an admirable manner, and he had not the smallest doubt that if any country should be so unwise as to challenge us, without reasonable cause, to conflict, she would find that the fighting force of this country was perfectly and readily available, and in a manner which was never before known in the naval history of this or any other nation. Nothing short of madness could induce our neighbours, even with a military force a thousand times stronger than they possessed at the present moment, to challenge the fleets of England to mortal combat. His own idea was, we should only want the time to overtake our enemy's ships to destroy them or to lock them up in their own ports. And if we sometimes felt disposed to be impatient with the Government in respect of matters of this kind, we should never forget that our known strength and capability were a burden upon them. There would really be no great honour—none at all—in challenging France to a naval contest to-day. All that was necessary to do was to give France time to see the weakness alike of its situation in Africa and in the eyes of the world, and then he felt satisfied that the very dreadful prospect of a war between two great civilised and neighbouring States would have passed away, and there would be no such contest. If we had a war, well, he could say with truth, with the veriest Jingo : "We've got the ships, we've got the guns, and we've got the money too!"

Mr. W. Lester Jones (President of the Cardiff Chamber of Commerce) proposed "The Ports of the Bristol Channel." He referred to the go-aheadness of the Barry Company, remarking that what was formerly known as the basin of No. 1 dock was now called dock No. 3; while land that was mapped out as thirty-five

acres of timber-ponds, it was quite clear was intended as dock No. 4. He hoped the ports in the Channel would prosper. The toast was coupled with the name of Mr. T. E. Watson.

Mr. T. E. WATSON, J.P., responded. He could not aver that he was unaccustomed to address marine engineers, but he was afraid it usually resolved itself into an adjuration to "Get another knot on, and don't burn so much coal." As to the ports of the Bristol Channel, the first project for docks on the Avon was formulated by King Canute the Great, and it had been formulating ever since. As to Newport, there was a project to deepen the Alexandra Dock 2 ft., which upon 35 ft. was something. Barry, after all, was but a creek in the port of Cardiff. The enormous growth of the South Wales coal trade necessitated the creation of more docks. The competition between colliery and colliery was making more and more necessary a place of shipment as near as possible to the place of mining. When last he spoke of Port Talbot in that room he described her as "the new baby." The new baby was now a big girl. He was pleased to be able to say that in a day or two they would be able to admit ships at Port Talbot at a minimum depth at neap tides of 23 ft. Barry had so far shown the way, and Port Talbot would do her best to follow her. With regard to the marine engineering profession, he was pleased to know that the turbine engine used much more coal than the ordinary engine; so as a colliery proprietor he said, "More power to the *Turbinia*."

Mr. LLEWELLEN WOOD, J.P., proposed "The Institute of Marine Engineers." Conservative though he was proud to declare himself, yet he was glad to welcome the presence of that distinguished naval architect Sir Edward Reed, Cardiff's old friend. The members of the Bristol Channel Centre were past-masters in the arts of hospitality. Then, in the capacity of guests themselves, they have acquired a distinct reputation and wide experience. It had been partially disclosed

that night that whenever the Channel ports required to advertise their attractions they were wont to turn to the Bristol Channel Centre of the Institute of Marine Engineers. It appears that when Bristol wanted to make manifest the extent to which art had repaired the ravages of time, and had lent lustre to the charms that were becoming somewhat dimmed, or when Port Talbot—of whom his friend Mr. Watson was the *chaperon*—when Port Talbot was fain to display—what should he call it? she was a big girl—when Port Talbot was anxious to display the promise of her virginal immaturity it was to Mr. George Sloggett she appealed; and then she became surrounded by a bevy of potential admirers, all ready and competent to make her happy for the moment, whether more serious attentions followed after or not. To pass to the serious business of the Institute. As an outsider he knew enough to know that it played a very important and responsible part, especially as a channel through which the theories and discoveries of each member of the profession might be more or less tested by exposition and discussion. The Institute discharged most important functions—functions which could not, perhaps, be discharged by any other agency. In submitting the toast, he asked them to drink it in view of what Sir Edward Reed has just said—perhaps the most competent authority on the subject in the world—he asked them to drink it in view of the great work which was done for the country by the marine engineering profession for the certainty of our supplies, the defence of our coasts, the protection of our dependencies and possessions. What they had heard from Sir Edward accentuated the lessons of the late American-Spanish war. It appeared clear that no maritime skill, no courage, could possibly make up for such differences in the *materiel* of those fleets. What Sir Edward told them appeared to amount to this: that that speed, which, he learned, was largely the result of the application, the nice application, of mechanical appliances to the conditions under which

they worked, the trustworthiness and efficiency of equipment and armament, and of the complicated machinery—without which they could not be made effective—all these things were growing relatively of enormous importance. If he understood Sir Edward Reed aright, the man-of-war might be likened to some huge piece of floating machinery; and should we win other Niles and other Trafalgars the victories would have been half won in our designers' offices, in our dockyards, and in our workshops. After what Sir Edward had told them, no Englishman would look forward with diminished confidence to the issue of any maritime struggle in which we might be engaged. When they came to think of it, the toast had large claims upon their recognition by reason of its relation to the progress of the race. From the day when primeval man first learned that the labour of his hands might be made more diversified and effective by the employment of the rude tools at his command, down to to-day, the world's engineers—using the title in its largest sense—had been amongst the chief factors in the advancement of the world. Indeed, he would go so far as to omit the preposition, and say they had been the chief factors in the world's progress and development. See what the marine engineer had done! The sea, which for thousands of years was looked upon as the great separator of human races, had now become the readiest means of communication between them. We were no longer separated or estranged, but connected, by the ocean, and with it came the interdependence of nations, the wants and shortcomings of each of the earth's families being made up for by the superfluities of the rest.

The PRESIDENT, acknowledging the toast, observed that time was when a paper of Cardiff origin before the Central Institute was as hard to find as legendary treasure—that was never hidden because it never existed. The meetings of the Institute in Cardiff were then thinly attended, and those who spoke were weighed down by the necessities of business

which demanded a deep reserve. They had changed all that. Papers from Cardiff, comparatively speaking, were now abundant. Some of those papers were of such conspicuous merit that they attracted attention not only in this country but in all quarters of the globe where engines and ships were discussed. The Centre had been supported and encouraged by many of the best in Cardiff, as Mr. Llewellen Wood had pointed out. It had received not only moral support, but, in hours of stress, substantial and personal support, and he should like to say, in his humble opinion, that support and that sympathy had not been wasted. It had been darkly hinted that the Bristol Channel Centre had broken its allegiance with London, that the tail was trying to wag the body, much to the body's loss of dignity. Nothing could be more pernicious, nothing further from the truth. The Bristol Channel Centre had been jealous of the honour of the Institute at large: it had waged war, not against abuse, because no abuse ever existed, but in the cause of reform. The Institute of Marine Engineers had pursued its path and met with its successes without in the least degree trenching upon the purviews of the older engineering associations. It was brought into being, as Sir Edward Reed remarked on one occasion, by the call of an urgent necessity—that it was necessary to provide for the branch of the profession to which sea-going engineers belonged, and for those persons who by business relations were brought into contact with them. The progress of the Institute had been phenomenal; and he had more than once ventured the opinion that that progress and success was due in a large measure to a definite statement of qualifications. No person could become a full member of the Marine Engineers' Institute who was not a chief engineer, with, of course, a Board of Trade certificate, or unless he could present qualifications deemed by the Council sufficient to justify them in waiving the rule. This, if not a very high standard, was a definite standard, and the examination system had

been represented very conspicuously in the offices and the qualifications of the Institute. He did not believe that an examination qualification would permanently operate to circumscribe the operations of any institute; on the contrary, the efficiency and the enormous reach for good would be considerably increased. Take, for example, the experience of the Institution of Civil Engineers. When the examination system of admission to the student class was established the numbers went down during the first year or two, but by-and-bye, when the thing began to operate, students flocked in, and the Institution of Civil Engineers was now an enormous body. With that experience they had extended the system to the class of associate member; and it was now no longer possible for a person to remain in the Institution of Civil Engineers until he had convinced the Council that he had laid the basis of some professional education. In conclusion, the President intimated that, inasmuch as business cares were pressing heavily upon him, he should not be able to continue the duties of his office, and he must relinquish the position which, by the confidence of the Centre, he had been privileged to hold for eight years. No man could have been more nobly supported by his committee, no institution could have been more nobly supported by its secretary, and on many occasions he had received support and kindnesses from his committee which he should never forget.

PRESENTATION OF THE "DENNY" GOLD MEDAL.

Sir EDWARD REED proceeded to hand over to Mr. M. W. Aisbitt the "Denny" Gold Medal, awarded by the Institute for a paper on "Screw Propeller Shafts." He said a few weeks ago, amongst the many "Transactions" and "Proceedings" of engineering and other societies that he found upon his table was the paper by Mr. Aisbitt. He had no idea then that he should be asked to discharge the present very pleasant duty, but he read the paper—a compliment which he did not always pay to the papers that came before him.

He found it most interesting and valuable, because it contained an exhaustive statement of ascertained facts bearing on the subject, and showed a very able and delicate handling of the suggested causes of the defects in screw propeller shafts. He so much admired and appreciated the paper, as well as the discussion that took place upon it, that he read the whole a second time—the only time, he did believe, in his life when he had read a second time a paper and discussion on a professional subject. His humble opinion of its merits had been confirmed by the Council of the Institute in London, and Mr. Aisbitt had done the Bristol Channel Centre the honour of winning—and this was the second time it had been won by a Cardiff gentleman—the Denny Gold Medal of the Institute. The medal bore upon it a very excellent portrait of his old friend Mr. Peter Denny, of Dumbarton, a very old and respected friend of his, and he well remembered sitting beside him when one evening presiding in London at the annual festival of the Institute of Marine Engineers. A day or two ago he (Sir Edward) —while sitting upon another Merchant Ships' Load-line Committee—met Mr. Archibald Denny, a fellow-member, one of the very clever sons of Mr. Peter Denny, and had tried to induce him to come down with him to Cardiff and make the presentation of his father's medal, but he found it impossible to spare the time. He was about to leave home for a visit to Australasia, and he expected to be absent nine months. Mr. Denny desired him to say, however, that he took a lively interest in the proceedings of that evening, and few things could have given him greater pleasure than to have accompanied him had it been possible. He (the speaker) congratulated the Centre upon having among them gentlemen who were capable of bringing this prize to the Bristol Channel Centre twice in the very few times it had been awarded. Some people were more fortunate than others. He spent considerable time in the early part of last year in writing an elaborate paper upon the progress of the theory and mathematics of naval architecture since the Institution

of Naval Architects was founded in 1860. Well, he got no gold medal. He got a certain amount of credit, it was true, but he was not endowed with the gift of absorbing a great deal of praise. He enjoyed it for the moment, but we did not live for praise; and the man who concerned himself much about it was lacking in some quality or other. He hoped Mr. Aisbitt would live long to distinguish himself in his profession.

Mr. AISBITT, rising to acknowledge the presentation, was received with applause and musical honours. He returned his sincere thanks to Dr. Elliott, the President, from whom he had received so many favours, and to Mr. Sloggett and members of the Committee who induced him to write a paper, which had resulted in his being awarded the Denny Medal. He also expressed his gratitude to Sir Edward Reed for his kind observations. It might be deemed curious that a firm of shipbuilders should give a medal for engineering, but it should not be forgotten that engineers had had a great deal to do in teaching and developing the science of shipbuilding, in which connection he need only recall the fact that it was an engineer who built the *Great Eastern*. The profession of the marine engineer had advanced, and was still advancing, at a great rate, because, to be thoroughly up to date, the marine engineer ought to understand electricity and be able to take intelligent charge of refrigerating machinery. An important force that was coming to the front was that of liquefied air. It was a force that was scarcely comprehended yet. Imagine 600 feet of air compressed into one cubic foot!

Mr. T. W. WAILES (who first brought the Denny Medal to Cardiff) proposed "The Municipality of Cardiff," and the Mayor of Cardiff responded.

Mr. JOHN DUNCAN, J.P., gave "The President" in cordially appreciative terms, and with an expression of regret at the Doctor's intention to relinquish the presidential duties, and the toast was heartily honoured.

Dr. ELLIOTT having made response, the proceedings closed with the singing of the National Anthem.