

INSTITUTE OF MARINE ENGINEERS  
INCORPORATED.

SESSION



1899-1900.

*President*—SIR JAS. L. MACKAY, K.C.I.E.

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REPORT OF THE PROCEEDINGS

AT THE

ANNUAL MEETING

HELD AT

58 ROMFORD ROAD, STRATFORD,

ON FRIDAY, MARCH 16TH, 1900.

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CHAIRMAN—MR. A. BOYLE (MEMBER OF COUNCIL).

# INSTITUTE OF MARINE ENGINEERS INCORPORATED.

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PROGRAMME OF THE  
**ELEVENTH ANNUAL MEETING,**

On Friday, 16th March, 1900,

AT

58 ROMFORD ROAD, STRATFORD.

*Chairman*—MR. A. BOYLE (MEMBER OF COUNCIL).

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| 7.30 The CHAIRMAN.  | 8.40 Vote of Thanks to the Auditors.<br>Proposer, Mr. J. T. Smith.<br>Seconder, Mr. A. McIndewar.                               |
| 7.35 Appointment of Scrutineers.<br>Proposer, Mr. A. G. Crichton.<br>Seconder, Mr. G. W. Bartle.  | 8.50 Vote of Thanks to Hon. Solicitor.<br>Proposer, Mr. F. W. Shorey.<br>Seconder, Mr. C. Noble.                                |
| 7.40 The Annual Reports.<br>The Honorary Secretary.<br>The Hon. Sec. Bristol Channel Centre.<br>The Hon. Sec. Southampton Centre.                       | 9.0 Educational Experiences.<br>Mr. J. R. Ruthven (Convener Papers<br>Committee).   |
| 7.55 Financial Statement.<br>The Hon. Treasurer.  | 9.10 Report of Scrutineers.<br>Messrs. R. Adam and J. C. Anderson.  |
| 8.0 Adoption of Reports.<br>Proposer, Mr. Robt. Leslie.<br>Seconder, Mr. J. E. Elmslie.   | 9.15 Vote of Thanks to Scrutineers.<br>Proposer, Mr. A. H. Mather.<br>Seconder, Mr. W. Lawrie.<br>Response, Mr. J. C. Anderson. |
| 8.10 Vote of Thanks to the Retiring<br>President.<br>Proposer, Mr. S. C. Sage.<br>Seconder, Mr. J. R. Ruthven.  | 9.20 Appointment of Auditors.<br>Proposer, Mr. J. Blelloch { Messrs.<br>Seconder, Mr. Howie { A. Brown<br>& Hulme.              |
| 8.30 Vote of Thanks to Office Bearers<br>and Council.<br>Proposer, Mr. C. W. McLaren.<br>Seconder, Mr. C. Slater.<br>Response, The Chairman of Council. | 9.25 Vote of Thanks to Chairman.<br>Proposer, Mr. A. Hulme.<br>Seconder, Mr. G. Halliday.<br>Response, The Chairman.            |

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CHAIRMAN :  
MR. A. BOYLE (CHAIRMAN OF COUNCIL).

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THE CHAIRMAN : Gentlemen, As you are aware, this is the eleventh annual meeting of the Institute, and we are called together for the purpose of considering, and, if approved, passing and adopting the reports and accounts of the Institute for the last financial year. We make, as it were, a fresh start to-

night. We review the events and work of the past and the prospects of the future, and consider how far we have succeeded, and how far the objects and aims of the Institute have been carried out. Those objects and aims are not only the reading and discussion of practical papers and the dissemination of useful information on subjects connected with marine engineering, but also to furnish marine engineers with a centre—a rallying point, so to speak—and enable them to feel, wherever they may be, that the Institute exists to form a bond of union between them—a centre for the mutual advantage and benefit of all. There was some expectation that Sir John Durston, one of our past presidents, would take the chair to-night, but Mr. Adamson has handed me a letter received from him in which he says that he would have been delighted to attend but regrets to say he is leaving this afternoon for the country for a few days. Under those circumstances the best thing I can do is to proceed at once with the business, and the first business on the programme is the appointment of scrutineers.

Mr. A. G. CRICHTON moved that Mr. R. Adam and Mr. John C. Anderson be appointed scrutineers, and the motion having been seconded by Mr. G. W. BARTLE was at once agreed to.

The CHAIRMAN: I now call upon Mr. Adamson, our honorary secretary, to read the annual report.

The HON. SECRETARY (Mr. James Adamson): Before I read the report there is one sentence in Sir John Durston's letter, the first part of which the members will probably like to hear, although not the second part, which we read with regret, and wish him a speedy recovery. Sir John says: "I should have been delighted to attend your meeting on Friday, as I am to hear of the great and solid progress of the Institute during the past year, but I regret to say I am leaving to-morrow afternoon for the country for a few days, as I am run down

after an attack of influenza," and he closes with all good wishes for a successful meeting.

The annual report is as follows :

## ELEVENTH ANNUAL REPORT.

In the following Report on the work of the Session, carried on under the presidency of Sir James L. Mackay, the details of what has been done by the various Committees are touched upon in order to give Members an idea and choice of the directions in which they may give countenance and support to the Institute for the general good.

MEMBERSHIP.—The increase to and changes in the Membership have been as undernoted :

	1899. At Jan. 31.	Deaths.	SESSION 1899-1900. Resigna- tions.	Lapsed.	Elected.	1900. Jan. 31.
Past Presidents (Hon. Members)	2	—	—	—	1	3
Members . . .	758	9	12	70	96	763
Companions . . .	60	—	2	2	17	73
Associate Members	72	—	1	11	3	63
Associates . . .	77	—	—	13 (transfers)		63
Graduates . . .	68	1	1	21	,,	42
Totals .	1037	10	16	117	117	1007

The additions to the membership, 117, are greater than last Session by 39, but as the nett total membership on February 1, 1900, was only 1007, there is a nett decrease of 28.

Our losses from the Roll Book by death include the following names, and we read them with deep regret and sympathy for the relatives.

D. BROWN (Member), who died at East Ham, Essex, in October, 1899, was Superintendent Engineer to the Belle Line of Paddle Steamers.

H. P. CONWAY (Member), who died at Southampton over 12 months ago, and intimation of whose

death was received after the Annual Meeting held last year.

C. S. DU SAUTOY (late President of the Southampton Centre), who died at Southampton in October, 1899, was for many years Superintendent Engineer to the Union Co., Southampton.

G. INGLIS (Member), who died at Forest Gate, E., in May, 1899, was in the service of the P. and O. Co. for 37 years, and of that period Chief Engineer for 26 years. His last appointment was in the s.s. *Peninsular*.

J. PHILLIPS (Member), who died at Stamford Hill, N., in February, 1899, was retired from the P. and O. service 4 years ago. He had been in the service for 39 years, and Chief Engineer for 32 years. His last appointment was in the s.s. *Sutlej*.

J. W. SELLEX (Member), who died at Port Said in March, 1899, was in the service of the P. and O. Co. for 18 years, and was Engineer of the *Isis* when he died at Port Said.

W. SMITH (Member), who died at Upton Manor, E., in March, 1899, was in the service of the P. and O. Co. for 34 years, and for the last 24 years as Chief Engineer. His last appointment was as Chief Engineer s.s. *Malta*.

W. M. TAYLOR (Member), who died at Arbroath, N.B., in March, 1899, was Assistant Superintendent Engineer at Tilbury in the service of the Pacific Steam Navigation Co. up till within a few months of his death.

C. T. YOUNG (Member), who died at South Woodford, E., in January, 1900, was Superintendent Engineer to the Shaw, Savill and Albion Steamship Co. for the last 7 years, previous to which he was in the service of the Company as Chief Engineer of the *Arawa*.

G. W. OSWALD (Graduate), who died at Forest Gate, E., in May, 1899, after a wasting illness, he having been compelled to go home from Glasgow, where he was completing his apprenticeship.

The figures relating to the membership include the names of several who, in accordance with a resolution of Council, have been placed on a Probationary Roll, they having omitted, to date, to comply with the terms of the notice advising them of their election, subject to the proviso contained in the resolution which is as follows :

#### PROBATIONARY MEMBERS.

“RESOLVED: That in all cases where new members are proposed and passed by the Council in the ordinary course on payment of their entrance fees, each shall be advised that on receipt of his annual subscription the election will be ratified with full privileges; such subscription to cover twelve months, after which the member may pay pro rata for the remainder of the second year.

“Meantime the name of each probationary member shall be placed on a probation list until such time as his full qualification has been made.”

CENTRES.—During the session it was found necessary to place the Bristol Channel Centre on a new basis, and having had several conferences on the subject, after meeting a deputation appointed by the Members of the Centre, headed by the President, Sir John Gunn, it was agreed that an amount be returned for local expenses equal to that received from the B.C.C. Members in Annual Subscriptions, together with a grant of £25 per annum for 3 years, the entrance fees being retained in the General Fund for general expenses. In accordance with this agreement, and by the energetic and liberal support given by many of the local Office Bearers and Members, Rooms have been taken and furnished at Park Place, Cardiff, where the Members meet in their own reading room, or in larger assembly.

On the occasion of the Annual Dinner of the Centre, held in Cardiff on Saturday, October 28, the Rooms were inspected by the Hon. Secretary of the Institute, along with several of the Office Bearers of the Centre, and found to be very suitable for the purpose, and it is hoped that the Bristol Channel Centre, which has ever been full of life, will progress and develop to a greater extent with this new impetus given to it.

The Southampton Centre has not made progress during the Session, but the reverse, and it has been considered advisable to give up the Rooms hitherto rented for local purposes and have the furniture returned meantime to the Institute premises. Arrangements have been made for accommodation to be provided when required for meetings of local Members as may be found advisable. The illness and subsequent death of the President, Mr. C. S. Du Sautoy, referred to in the obituary, in October 1899, cast a gloom over the affairs of the Centre, and militated against its progress meantime.

The establishment of other Centres has been proposed and some correspondence has taken place on the subject, but nothing definite has been arranged.

### ENGINEERS' QUALIFICATIONS.

Referring to the various discussions which have been held on the subject of "The Qualifications for Board of Trade Certificates," the following letter from the Board of Trade was received on March 18, 1899, viz:

"BOARD OF TRADE (MARINE DEPARTMENT),  
 "7 Whitehall Gardens, London, S.W.,  
 "*March 11, 1899.*

"SIR,—I am directed by the Board of Trade to transmit to you the enclosed proof of revised regulations which have been prepared with regard to the examinations of engineers in the mercantile marine. A note of the principal points in which this draft differs from previous issues will be found on page 3 of



the print, and copies of the existing regulations are enclosed herewith for purposes of reference. Before issuing this revised edition the Board would feel much obliged if your Association would be good enough to favour them with any observations which may occur to you with regard to it.—I am, Sir, your obedient servant,

(Signed) "INGRAM B. WALKER."

The proposals were carefully considered, and after several discussions on the subject, report of which is appended, the following reply was sent to the Board of Trade, viz. :

"INSTITUTE OF MARINE ENGINEERS,  
" 58 Romford Road, Stratford,  
*May 16th, 1899.*

"DEAR SIR,—In forwarding the result of the various conferences and discussions which have been held by the Council, the Members in open meetings, and a Committee of the Council of the Institute of Marine Engineers, on the subject of the proposed regulations for engineer certificates of competency to take the place of the former regulations, I have great pleasure in desiring you to convey to the Board of Trade, and especially to the Marine Department, the warmest thanks of the Office Bearers and Council of this Institute for the great and unvarying courtesy accorded to all in connection with the correspondence and the labour involved in bringing the altered regulations to their present form; not only are thanks due to the Board of Trade from this Institute, but from the whole country—for the whole community is interested in the improvements suggested or implied. I have the honour to express this in the name of the Institute for conveyance to the Board. With this preface I beg to say that the proposed new regulations have been very carefully considered and compared with the old, many evenings having been devoted to the subject, both in open discussions and in committee and Council meetings, due weight being given to

every expression of opinion, especially where any difficulty or hardship might be found to exist in young apprentices obtaining the necessary qualifications, as, what is wanted is *not to restrict the number* of qualifying engineers, but *to improve the quality* of such as seek to qualify, *so far as may be by regulation.*

“ I place this on record, specially so that we may not be misunderstood in connection with this subject, as we have no sympathy with placing arbitrary and artificial restrictions on a natural trade output for the purpose of temporary gain to a small section of the community. The observations and recommendations we have to offer to the Board for consideration are embodied in the form of a report made by a committee of the Council, as representing the views of the Institute on the subject. Article No. 8 is the first rule which embodies any alteration of note. The alteration is a decided improvement, and the whole tendency of the new regulations will be to ensure a better trained class of men entering for the second-class certificates, inasmuch as it defines the requirements in respect to the workshop service, and also ensures attention to the special department of experience calculated to make the most efficient men.

“ Article No. 9 is also an improvement on the old rule, by empowering the examiner to require a definite statement of experience to be submitted, signed, and endorsed in respect to the sea service of candidates.

“ Article No. 22 is the most important of the new regulations, and contains several points which are specially worthy of comment. These may be summarised as follows :

“(A) The five years' workshop service cannot be advocated too strongly, and it is a matter of congratulation that the Board of Trade has seen it to be imperative to insist upon this time as a minimum before a candidate presents himself for a second-class certificate.

“(B) The definite time that a candidate must serve in special departments of the works in order to qualify him is specified distinctly, and this is considered also a step in the right direction.

“(c) The time allowance for candidates attending a technical school is considered to be too much relatively to workshop service—i.e., three years technical school to two years in the practical workshop.

“It is desired to point out that the usual conditions of attendance at technical schools are such that no more than one portion of the time should be allowed to count as equivalent to one-third of the portion for workshop service, that is, three years' technical school training to one year workshop service, and no more than one year's service based on this equivalent to count for technical school training under any conditions, that is to say, the whole service cannot be spent at a technical school.

“We apprehend that the service of three years stipulated in the erecting or fitting shop may be completed after the technical apprenticeship expires, that is to say, for instance, in the event of an apprentice having served the *major part* in other departments of the works. Here it is to be remarked that the qualifying word '*minor*' is not necessary in line 8 of p. 14, especially as the pattern-making, surfacing, and drawing office at least are not looked upon as '*minor*' departments.

“It should be made clear that the three years' erecting shop service is not as an absolute necessity to be passed within the apprenticeship limit whether it be five or seven years, according to the rule in the particular workshop, the latter being not unknown.

“The expression *N.H.P.* is considered to be too vague, and if used to designate a standard it ought to be defined so as to express, at least approximately, a certain ratio to the actual power. Meantime the expression has no definite limit of elasticity, and has become a by-word signifying that which is undefined.

“As such would be of great service for owners of small launches and boats desiring engineers, it is regretted that no provision is made by which a third grade certificate might be established, not necessarily a compulsory one, but as an encouragement to junior engineers as a stepping-stone to the second, so that the process of education may be gradual and free from cram.

“It is noted with satisfaction that the attention of candidates is directed to the study of auxiliary machinery, and that questions on such are included in the papers set down for the examination of candidates; the questions themselves are exceedingly good and well-adapted for the purpose intended.

“It is considered that the new regulations should come into force in 1900, certainly sooner than 1904 for many obvious reasons, as a good deal of publicity has already been given to the subject-matter of the proposed alterations, definitely during the past eight or nine months, and indefinitely during the past eight or nine years. Hence, to some extent, the feverish haste with which young men have rushed “to put in their three years,” as it is termed, in order to obtain the time qualification for certificates as quickly as possible, and are sometimes encouraged by a tin-tack policy in this course, utterly regardless of the more important qualifications of ability and experience, which those who have to carry on their work with such raw material consider to be paramount. It is not fair either to the steamship owners or the certificated engineer in responsible charge of the machinery to force upon them junior engineers who have had less workshop experience than what may be called technically the conscientious limit, as the shipowner can only be guided by the regulations framed, and as such regulations are generally credited with imposing too much than too little, hence the tendency is to encourage the *bare* limit by many, the bent of whose policy is a short time-serving one for immediate profit rather than for preservative economy.

“ It is not considered desirable to make the qualifications to pass *any easier* for a foreigner who cannot express himself clearly in the language of the engine-room; the recent judicial comments in connection with the deck department give point to this.

“ It is noted with satisfaction that the facilities for obtaining certificates given in the old regulations without proper qualifications obtained in the workshops are withdrawn, as having served their purpose and become obsolete.

“ Thanking you for your kind courtesy in the matter; on behalf of the Council,

“ I am, yours faithfully,

“ JAS. ADAMSON,

“ *Hon. Secretary.*”

#### THE LATE T. H. ISMAY.

At an Ordinary Meeting of the Institute held on Monday evening, November 27, presided over by Sir John Durston, K.C.B. (Past President),

The CHAIRMAN said: It is my privilege to-night to preside over your deliberations, but before commencing the business of the evening I should like to say a few words in relation to an event which has occasioned universal sorrow. During the past week the country has sustained a great loss by the death of Mr. T. H. Ismay, the head of the White Star Line. The deceased gentleman was a leader of men and a captain of industry, and one to whom we owe as much as to any man living the remarkable development of steam shipping, both in respect of its high tonnage capacity and its great speed. I am quite sure that you will wish to join with me in sympathising with his family. With your concurrence I will propose a resolution expressing to the family of the late Mr. Ismay the deep regret with which the Members of the Institute of Marine Engineers have heard of his death, and our sincere sympathy with the members of his family in their bereavement.

The resolution was received and passed by all present standing.

The following letter was sent to Mrs. Ismay in accordance with this resolution :

“ 58 ROMFORD ROAD,  
“ STRATFORD, LONDON, E.,  
“ *November 29, 1899.*

“ DEAR MADAM,—It is my melancholy duty to offer to you and your family circle the respectful sympathy of the Institute of Marine Engineers, and to express the deep regrets of the Office Bearers and Council in the severe loss you and yours have sustained by the death of your beloved husband—a loss, too, which is shared by the nation, in that one by whose enterprise and public spirit the commercial interests of the country have been greatly advanced, has been removed from among the leaders of men.

“ A resolution expressive of sympathy and regret was moved by Sir John Durston at our meeting on Monday night, and I now beg to convey to you these few lines in accordance with the resolution.

“ I am, Madam, yours respectfully,  
(Signed) “ JAS. ADAMSON,  
“ *Hon. Secretary.*

“ Mrs. T. H. ISMAY, Liverpool.”

“ 30 JAMES STREET, LIVERPOOL,  
“ *December 12, 1899.*

“ DEAR SIR,—I write on Mrs. Ismay’s behalf to acknowledge the receipt of your letter of November 29, informing her that at a meeting of the Institute of Marine Engineers a resolution was passed expressing sympathy with Mrs. Ismay and family in their great bereavement.

“ Mrs. Ismay has been deeply touched by the appreciative references which your letter contains to her husband’s life and work, and I am to ask that you will be good enough to convey to Sir John Durston and the Members of the Institute her most grateful thanks and those of her family for their kindness.

“ Believe me, yours faithfully,  
(Signed) “ R. ISMAY.

“ JAMES ADAMSON, Esq.”

## THE DENNY MEDAL.

At the same meeting the Denny Gold Medal was presented to Mr. R. D. Keay (Member) for his paper entitled "The Thermo-dynamics of the Steam Engine," when the following words were addressed by the CHAIRMAN: My next duty is a very pleasant one. It is to present to Mr. R. D. Keay the Denny Gold Medal which has been awarded to him by the Council of the Institute for his paper on "The Thermo-dynamics of the Steam Engine," read in November last. All here will admit the great value of Mr. Keay's paper, which furnishes matter for deep thought, and no doubt in the future it will bear more thought than it has received up to the present. It is only by the careful consideration and study of the subject which Mr. Keay has dealt with, combined with practical observation and experience, that we make advances, and I think we are all very much indebted for this contribution to our *Transactions*. On behalf of the President and Council of the Institute I present you, Mr. Keay, with this medal, and I wish you long life to enjoy the honour of possessing it.

PAPERS AND DISCUSSIONS.—Five Papers have been read and discussed in the course of the Session, in addition to the discussions held on the proposed new Board of Trade Regulations for Engineers. These Papers and the discussions thereon are being published and issued to Members. (Mr. J. R. RUTHVEN, *Convener*).

TRANSACTIONS.—Forty-two bound volumes have been disposed of during the year—being bound up for Members in the official binding at 3s. 6d. each—and thirty presented to libraries and kindred societies with whom we exchange *Transactions*. (Mr. A. G. CRICHTON, *Convener* for Issue of *Transactions*). The list of societies with whom we exchange is as follows:

The Institution of Naval Architects.

The Institution of Engineers and Shipbuilders in Scotland.

The Institute of Mechanical Engineers.

The N.E. Coast Institution of Engineers and Shipbuilders.

The Liverpool Engineering Society.

Ecole d'Application du Génie Maritime.

L'Association Technique Maritime.

The American Society of Civil Engineers.

The Cornell University Library.

Société des Ingénieurs Civils de France.

The *Transactions* are also sent, being granted by application, to the following libraries, viz :

The Guildhall Library.

The West Ham Free Library.

The Patent Office Library.

The Brisbane Public Library.

The New Zealand Government Assembly Library.

For purposes of copyright, copies of the *Transactions* are also sent to the National Libraries.

EDUCATIONAL.—Three lectures were delivered in the spring of 1899 by Mr. J. G. Hawthorn, as per list of meetings, but it was considered that, owing to the new Technical Institute which had been opened in the Romford Road, the classes which had previously been held in connection with the Educational Committee should be stopped, and the time and labour expended on the classes devoted more to experimental and test work, with occasional lectures. (Mr. J. G. HAWTHORN, *Convener*).

PROPERTY.—There have been no additions to the property of any special note during the Session ; there have been a few presentations as per list attached, and the purchases made on behalf of the Tennis Club. The property has been kept in good repair as found necessary. (Mr. S. C. SAGE, *Convener*).

THE READING ROOM has been well supplied with papers and periodicals, as per attached list. (Mr. C. NOBLE, *Convener*).



THE LIBRARY has been added to by nineteen volumes presented. The complete catalogues may be examined and books obtained on loan by Members at any time. The list at present issued only contains the names of the books received in the course of the Session. (Mr. J. BLELLOCH, *Convener*).

EXPERIMENTS AND TESTS. — The Committee appointed to carry on experiments and tests has devoted a good deal of time to this work, meeting on Friday, and occasionally on other, evenings. It is considered by the Council that this department of the work of the Institute should be encouraged as much as possible, as it is to the advantage of all classes of the membership to take an interest in investigations which tend to improved results being obtained by indicating the directions in which improved results may be looked for. The results of some of the experiments have been embodied in papers contributed by Mr. G. HALLIDAY (*Convener* of the Committee).

PRESS CUTTINGS. — The scrap-book containing records and notices of interest and value for reference is being kept up and posted for the use of Members. Further contributions are invited. The contributions invited are press cuttings containing descriptions of special experiences, accidents, and records of repairs carried on under difficulties, experimental data, or contributions in writing from members giving their own experiments and results. (Mr. A. CAMPBELL, *Convener*).

RECREATION. — During the summer a Lawn Tennis Club was started and carried on with considerable vigour. Mr. A. H. Mather (Secretary) reports that the opening season of the club was very successful, the members' attendance on the three evenings per week appointed and on Saturday afternoons being very satisfactory.

The season ended on Saturday, September 30, when a photographic group of the Members was

taken, and the proceedings closed very pleasantly with a social meeting in the lecture hall.

The balance sheet is as follows, showing a balance of £2 12s. to the credit in addition to the property, as an asset against the grant of £5 made by the Council to start the club, prepare the ground, and purchase material.

### TENNIS CLUB BALANCE SHEET.

EXPENDITURE			INCOME		
	£	s. d.		£	s. d.
General Expenses ..	3	0 9	Subscriptions .. ..	4	5 0
Social Evening ..	2	12 6	Donation, Mr. Leslie..	1	0 0
Cost of Photos..	1	12 6	„ Mr. Sage ..	0	10 6
Balance ..	2	12 0	Lost Balls—Fines ..	0	3 9
			Tickets for Social ..	2	13 6
			Payments for Photos	1	5 0
	£9	17 9		£9	17 9

Grant received from the Council £5.

A. H. MATHER, *Hon. Secretary.*

RECREATION (*continued*).—The Annual Dinner was held on Wednesday, November 15, in the King's Hall, Holborn Restaurant; the detailed report of this has been already issued.

The Annual Conversazione was held on Wednesday, January 31, in the Town Hall, Stratford, and, as usual, it was a most successful gathering. The President wrote expressing regret that he was unable to be present, being called away to Australia before the event took place. His absence was much regretted at the assembly.

There were very few exhibits on this occasion. Mr. Caird exhibited a series of excellent lantern views, illustrative of bird and flower life; the photographs from which the slides were taken evidencing astonishing deftness and painstaking on the part of the photographer.

The programme of music was brief, and dancing commenced about eight, and was continued till about

2 a.m. (Messrs. W. I. TAYLOR and W. C. ROBERTS,  
*Joint Conveners.*)

THE WEST HAM TECHNICAL INSTITUTE in Romford Road, Stratford, was unfortunately attacked by fire in October, 1899, unhinging the classes and lectures in the midst of the work of the Session. The use of our lecture hall was offered to the authorities to assist them in their efforts to keep the classes going; other and more suitable premises, however, were arranged for in the circumstances.

The published reports which have recently appeared on the subject of the engineers of the Navy, their position and rank, and the prospect that the engineer-in-chief of the Navy will occupy a rank and position which his responsibilities and that of his staff entitle him to, is looked upon as matter of congratulation.

The Institute was represented at the meetings of the Sanitary Institute, held in the autumn of 1899 at Southampton. A record of the *Transactions* of this Conference was obtained and placed in the library.

The Paris Exhibition to be held during the coming Session will probably prove of great service and interest, and Members who may attend are desired to take notes and give the results of their experiences in the form of papers, to enrich our *Transactions*. On behalf of the Council,

JAS. ADAMSON,  
*Hon. Secretary.*

### QUALIFICATIONS OF ENGINEERS.

The Revised Regulations proposed for adoption by the Board of Trade to take the place of the existing Regulations for the conduct of examinations and passing of Engineers, were discussed at several meetings of the Institute held in March and April, 1899.

At the first meeting, held on March 18th, the letter received from the Board of Trade was read, and the paragraphs of the proposed Regulations were read and discussed. It was pointed out that in the

Revised Regulations the question of a third grade certificate was not referred to, but with regard to the period of apprenticeship a most important alteration is proposed. Paragraph 22, on page 3 of the print referred to in the letter, read as follows:

“Candidates for second-class certificates must serve as apprentice engineers for five years instead of three years; three years of the five must be spent in fitting or erecting; no service in drawing office or boiler yard will count for more than twelve months; time spent in technical schools may be accepted under certain conditions; all applicants to produce testimonials of ability as an engineer workman. The sea service required cannot be performed in vessels with engines of less than 66 N.H.P. Sea service alone will no longer qualify a candidate for examination.”

Paragraph 23 is as follows:

“Qualifications for First-Class.—Under old rules a candidate had to serve as second, third, or fourth engineer in a foreign-going ship, or as second engineer in a home trade passenger steamer. Now service as senior engineer in charge of a watch on a foreign-going steamer, or as first or second engineer of a home trade steamer will be accepted. The vessels must be of at least 99 N.H.P.”

The discussion was adjourned till next meeting.

The discussion of the proposed regulations was continued at a meeting held on Monday, March 27th, when the following paragraphs were under consideration:

“8. All applicants will be required to produce, in addition to the official discharge certificates, testimonials as to their workshop service and as to their service at sea. The testimonials as to workshop service must be signed by the employer, and must testify to the applicant's conduct and ability, and state what kind of work he was engaged on (*e.g.*, fitting, erecting, etc.), and for how long.”

"9. Testimonials as to service at sea must testify to the applicant's sobriety, experience, ability, and general good conduct for at least the last twelve months' service at sea preceding the date of application to be examined. They must be signed by the master and chief engineer (or, in the case of testimonials to chief engineers, by the master and superintending engineer), and must clearly state whether the applicant was on regular watch, and in regular charge of a watch on the main engines or boilers. It is desirable that testimonials of candidates should be endorsed by the superintending engineer. No time spent in clerical work will be allowed to count."

"14. Foreigners must prove to the satisfaction of the examiners that they can speak and write the English language sufficiently well to perform the duties required of them on board a British vessel. In every case, before failing a candidate for insufficient knowledge of the English language, the examiner should refer the matter to the local senior examiner. Where the port has only one examiner, the matter should be referred to the senior examiner of the district, who, if the failure be confirmed, will endorse the report on the form Examination 15."

"22. Second-class Engineers.—A candidate for a second-class engineer's certificate must be 21 years of age; (a) he must have served as an apprentice engineer for five years at least, and prove that during the period of his apprenticeship he has been employed on the making or repairing of steam engines, boilers, etc. Three years of the apprentice time must have been passed in fitting or erecting, or in both, and no period of service in the drawing office, boiler yard, and other minor departments of the works will in either case count for more than twelve months' workshop time. In calculating the five years of artisan service which are to constitute the required apprenticeship the time spent at a technical school (recognised by the Board of Trade as suitable), where there is an engineering laboratory, may be taken into account and accepted as equivalent to artisan service

at the ratio of three years in the technical school to two in artisan service, provided that the applicant was over fifteen years of age, and can produce the principal's certificate for regular attendance and satisfactory progress, and provided also that in such case the other portion of the time was spent in the fitting or erecting shops of an engineer, as indicated above. . . ."

With reference to Rule 8, it was pointed out by Mr. RUTHVEN and others that great difficulty, and even hardship, might result to candidates in cases where employers refused to give testimonials as to workshop service, and it was stated that some employers made it a rule never to give testimonials of the kind to men who had been in their employ. On the other hand it was asserted that the Board of Trade had never experienced any difficulty in obtaining these testimonials, and that while employers objected to giving testimonials to be hawked about the country, they seldom raised any objection when applied to by other employers. It was also explained by the Chairman and others that under the old rules it was only necessary for the testimonial of the employer to state that a man had been employed in his engineering works for a certain period, while the new rule made it necessary for the testimonial to state the actual work on which the man had been engaged. Mr. W. Lawrie, Mr. M'Laren, Mr. Troup, Mr. Halliday and others also spoke on the subject, and in the result a resolution was unanimously passed approving of the amended rule.

On Rule 9 Mr. SHOREY disapproved of the suggestion that engineers' testimonials as to sea service must of necessity be signed by the master of the ship, but the Chairman, Mr. Lawrie and others pointed out that in law the master employed everybody on board the ship, and was the person legally responsible for giving characters to the whole of the crew. It was also suggested by the Chairman that this rule had been amended with the view of meeting the cases

of those engineers in twin screw ships who ranked as junior seconds, junior thirds, and junior fourths. Formerly nobody below the rank of fourth engineer could sit for a certificate, but under this new rule the examination was open to any engineer who had had charge of a watch. It was understood that the meeting approved of the rule as amended.

On Rule 14 the Hon. SECRETARY explained that the alteration proposed by the Board of Trade eased the position somewhat for foreigners, inasmuch as before a candidate was failed for insufficient knowledge of the English language the matter must be referred to the local senior examiner. Mr. Shorey did not consider that Board of Trade certificates should be granted to foreigners at all, and he moved a resolution to the effect that this view should be urged upon the Board of Trade. Mr. Lawrie doubted the wisdom of passing any such resolution. At the same time he did not think that the foreigner should be given any increased facilities, and he moved as an amendment that the provision as to foreigners should remain as in the present regulations. Mr. F. Cooper seconded this amendment, which in the end was carried.

Rule 22 was described by Mr. ADAMSON as the most important of the whole lot. It provided, he said, that candidates for second-class certificates must serve as apprentice engineers for five years instead of three years; three years of the five must be spent in fitting or erecting; no service in drawing office or boiler yard would count for more than twelve months; time spent in technical schools might be accepted under certain conditions; all applicants must produce testimonials of ability as engineer-workmen. The sea service required could not be performed in vessels with engines of less than sixty-six N.H.P. Sea service alone would no longer qualify a candidate for examination. Mr. Cooper thought this rule as now framed by the Board of Trade required some further alteration. Supposing a lad on going into a work-

shop was employed for the first three or four years in turning, he would be disqualified for all time from sitting for a certificate, because the rule said that three years out of the five years' apprenticeship must be passed in fitting or erecting, or in both. Mr. Lawrie and Mr. Noble urged that three years in a technical school should only count as the equivalent of one year of artisan service; and the Chairman considered it an excellent feature of the new rule that it omitted the service as a journeyman mechanic as a qualification for examination. Mr. Troup objected to it being made compulsory to serve an apprenticeship in the making and repairing of "steam engines," and he moved that the words in the first sentence of subsection A read "on the making or repairing of engines, boilers, and other machinery." Mr. Lawrie thought the "etc." in the rule after the words "steam engines, boilers," covered everything that was required, and he moved as an amendment that the clause be approved as drafted by the Board of Trade. Mr. Halliday seconded this amendment, which was carried.

The further consideration of the subject was adjourned until the second Monday in April, and a vote of thanks to the Chairman (Mr. J. G. Hawthorn) for presiding closed the meeting.

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At the meeting held on Monday, April 10th, the following discussion took place :

Mr. J. G. HAWTHORN (Member of Council), who presided, said he thought they would regard it as a very satisfactory feature of these new rules that the alterations were generally in the direction of stiffening the examinations for engineers' certificates, and the effect would therefore be to raise the status of marine engineers. It must be borne in mind that the facilities for acquiring knowledge in all subjects were now vastly superior to those available in years gone by, and it was a great advantage to the service



to get the examinations out of the old groove. Having regard to the character of these draft rules, he thought the Institute had reason to congratulate itself on the result of the action it had taken in the matter. At the last meeting they dealt with the first twenty-one rules, and the first part of Rule 22. The Hon. Secretary would now deal with the alterations in the following Regulations.

Mr. ADAMSON stated that in connection with Rule 22, which related to the qualifications for a second engineer's certificate, four subsections had been introduced which were entirely new. They were in the following terms :

“(g.) He must be able to explain the method of testing and altering the setting of the slide valves, and method of testing the fairness of shafts and adjusting them. (h.) He must be able to calculate the suitable working pressure for a steam boiler of given dimensions, and the stress per square inch on crank and tunnel shafts when the necessary data are furnished. (i.) He must understand the construction of steering engines, evaporators, feed filters, and feed heaters. (j.) He must understand the construction of centrifugal, bucket, and plunger pumps, and the principle on which they act.”

No. 23 of the new rules defined the qualifications for a first-class certificate. Under the old rules a candidate had to serve as second, third, or fourth engineer in a foreign-going ship, or as second engineer in a home trade passenger steamer. Under the proposed new rule service as senior engineer in charge of a watch on a foreign-going steamer, or as first or second engineer of a home trade steamer would be accepted; but the vessels must be at least 99 n.h.p. Sub-paragraph (i) of this rule was new. It read :

“(i.) He must understand the construction of, and be able to maintain in working condition, the auxiliary machinery which is placed under his charge, viz. : Refrigerating machinery, electric light engines

and dynamos, electric motors fitted to ship's boats, hydraulic machinery and the various descriptions of steering engines, etc."

THE CHAIRMAN said he thought that in this rule the Board of Trade had made a very acceptable concession, for there could be no doubt that the old regulations on this point pressed very hardly upon many young men in the home trade. Hitherto a man might have served for three or four years as chief engineer of a steamer running across the Channel and developing 1,200 or 1,500 horse-power, and yet not be entitled to sit for a chief engineer's certificate. Under the new rule this undoubted hardship would be removed. He also thoroughly approved of the suggested new subsection, for it was most desirable that a chief engineer should have an adequate knowledge of the different auxiliary machinery on board a modern steamship. It was, perhaps, unnecessary to move a separate resolution in regard to every one of these rules, but in the absence of any proposal or opinion to the contrary, he would take it that the meeting approved generally of the new regulations as drafted by the Board of Trade.

Mr. W. LAWRIE entirely approved of what had fallen from the Chairman, and after some remarks from Mr. M'Laren,

The HON. SECRETARY stated that the council had appointed a small sub-committee to go into this matter. After considering the various opinions expressed in the course of the present discussion, this sub-committee would formulate the reply proposed to be forwarded to the Board of Trade, and it would be submitted to a future meeting for approval. Rule 27 specified the qualifications for extra chief certificates, and it included two new paragraphs in the following terms :

"(g.) He must be able to explain the construction and working of the refrigerating machinery in use on

board ship, the electric lighting plant, the steering engines, hydraulic and pneumatic engines, the pumps, and all other auxiliary machinery placed under the chief engineer's control. (r.) In order to intelligently deal with ballast tanks, the cocks, valves and pumps of which are under the chief engineer's control, and to co-operate the more readily with the master in keeping the vessel in a safe condition especially when she is light, and when coaling operations are proceeding, candidates are expected to possess an elementary knowledge of the stability of floating bodies."

The CHAIRMAN then called attention to the principal features of several succeeding rules, including the following :

"30. In the case of candidates for first-class certificates qualifying service means service on regular watch as senior engineer in charge of the main engines or boilers. During the whole of the period claimed, candidates must have been in possession of second-class certificates. In the case of candidates for second-class certificates, qualifying service means service as engineer on regular watch on the main engines or boilers. In no case will time spent in clerical work be allowed to count."

"32. Being on regular watch means being on watch for at least eight hours a day.

"35. Service in home trade and coasting steamships of not less than 66 nominal horse-power will be accepted as qualifying service for a second-class certificate, provided the candidate has taken regular watch on the main engines and boilers, and his name is borne on the ship's articles as engineer during the whole period. Service in these vessels, if of 99 nominal horse-power, will be accepted as qualifying for first-class certificate if the candidate has been first engineer during the whole period, his name having been entered as such on the ship's articles. In all cases service in the home trade must be half as long again as service performed in foreign-going ships."

Strong objection was expressed by several members to Rule 42, which reads as follows :

“42. An officer who has attained the rank of engineer or assistant-engineer in Her Majesty's Navy or Indian Marine Service is entitled without examination, if an engineer, to a certificate of service as first-class engineer, and if an assistant-engineer to a certificate of service as second-class engineer. These officers may be examined for a certificate of competency on the same conditions as engineers of the mercantile marine.”

Mr. HALLIDAY considered that a naval engineer should only be allowed to apply for a certificate under precisely the same conditions as an engineer in the mercantile marine.

Mr. F. COOPER agreed with this view, which was supported by Mr. Lawrie, Mr. Mather, and others.

The whole of the draft rules having been dealt with,

The CHAIRMAN said that the sub-committee would probably report to the Council and formulate the reply to be forwarded to the Board of Trade.

A vote of thanks to the Chairman concluded the proceedings.



# INSTITUTE OF MARINE ENGINEERS. (SESSION 1899-1900.)

## BALANCE SHEET, 31st JANUARY, 1900.

<b>Liabilities.</b>				<b>Assets.</b>			
				£ s. d.			
To Sundry Creditors .. .. .			172 11 9	By Cash—			
„ Subscriptions in advance for Session 1900-1901			135 4 11	At Bank .. .. .	208 6 5		
„ Denny Gold Medal Fund .. .. .			261 13 4	On Deposit .. .. .	300 0 0		
„ Stephens' Legacy Fund and Interest—						508 6 5	
	£ s. d.			„ Petty Cash in hand .. .. .		0 1 2	
Balance 1st February, 1899..	102 10 0			„ Sundry Debtors for Conversazione Tickets ..		49 15 0	
<b>Add Interest, 1899 .. .. .</b>	<b>2 10 0</b>			„ Consols 2½ per cent. (£300 @ 112½ cost) ..		336 7 6	
		105 0 0		„ Freehold of Institute Buildings, 58 Romford Road, at cost, with extension .. .. .		1500 0 0	
„ Interest on Consols Accumulated Fund—				„ Furniture, etc., at Institute—			
Balance 1st February, 1899..	7 9 7			Balance 1st February, 1899 ..	260 13 11		
<b>Add Interest 1899 .. .. .</b>	<b>7 19 8</b>			<b>Less Depreciation, 5 per cent.</b>	<b>13 0 8</b>		
		15 9 3				247 13 3	33
<b>Less Interest on Stephens' Legacy Fund .. .. .</b>	<b>2 10 0</b>			„ Additions, Alterations and Repairs to Institute—			
		12 19 3		Balance 1st February, 1899 ..	235 14 1		
Revenue Account—				<b>Less Depreciation .. .. .</b>	<b>26 3 10</b>		
Balance 1st February, 1899..	1,984 13 6					209 10 3	
<b>Add Excess of Income, 1899</b>	<b>180 10 8</b>			„ Insurance, unexpired .. .. .		0 19 10	
		2165 4 2					
		£2852 13 5				£2852 13 5	

We have examined the above Balance Sheet with the Books and Vouchers, and certify it to be in accordance therewith and, subject to our report of this date to the Council, correct. We have verified the Bank Balances and Investments.

FEAST, DRAKE & CO.,  
Chartered Accountants.

St. George's House, 6 and 8 Eastcheap, London, E.C.

6th March, 1900.

## REVENUE

Dr.

1st February, 1899, to

	£	s.	d.	£	s.	d.
<b>To General Expenses—</b>						
Bank Charge .. .. .	0	11	7			
Postages .. .. .	15	17	1½			
Telegraphic Address .. .. .	1	1	0			
Inscription on Medal .. .. .	0	2	6			
Engrossing Certificates .. .. .	2	2	0			
Stationery and General Printing .. .. .	17	16	8			
Assistant Secretary's Salary .. .. .	100	0	0			
Chartered Accountants' Fees .. .. .	10	10	0			
Expenses of Deputations, etc. .. .. .	7	3	0			
				155	3	10½
<b>„ Rates, Taxes, etc.—</b>						
Rates and Taxes .. .. .	24	14	2			
Gas .. .. .	15	6	10			
Water .. .. .	3	4	0			
				43	5	0
<b>„ House Account—</b>						
Caretaker's Wages .. .. .	62	12	0			
Coals .. .. .	4	8	0			
Sundries .. .. .	2	5	8½			
Garden .. .. .	10	0	0			
Repairs, etc. .. .. .	9	9	6½			
				88	15	3
<b>„ Insurance .. .. .</b>				1	14	6
<b>„ Advertisements .. .. .</b>				4	10	0
<b>„ Depreciation—</b>						
On Furniture .. .. .	13	0	8			
On Repairs & Additions to Building .. .. .	26	3	10			
				39	4	6
<b>„ Reading Room Expenses .. .. .</b>				8	7	7
<b>„ Papers and Discussions—</b>						
Printing and Lithography .. .. .	136	1	11			
Reporting .. .. .	28	5	0			
Postages .. .. .	21	14	4			
				186	1	3
<b>„ Recreation Section—</b>						
Expenses (Dinner) .. .. .	123	16	8			
„ (Conversazione) .. .. .	75	13	0			
„ (Tennis Club) .. .. .	4	13	1			
				204	2	9
<b>„ Experimental Department Expenses .. .. .</b>				7	12	4
<b>„ Interest—</b>						
Denny Gold Medal .. .. .				10	0	0
<b>„ Transactions Section—</b>						
Expenses of Binding Volumes .. .. .				14	3	6
<b>„ Southampton Centre .. .. .</b>				13	14	3
<b>„ Bristol Channel Centre—</b>						
Expenses to date of Resolution .. .. .	12	13	8½			
Grant as per Resolution .. .. .	25	0	0			
Expenses estimated at amount of Subscriptions handed to this Centre during Year .. .. .	82	8	0			
				120	1	8½
<b>„ Balance .. .. .</b>				180	10	8
				£1077	7	2

## ACCOUNT.

31st January, 1900.

Cr.

	£	s.	d.	£	s.	d.
<b>By Entrance Fees—</b>						
Members .. .. .	71	1	0			
Associate Members .. .. .	2	10	0			
Associates .. .. .	3	15	0			
Graduates .. .. .	0	10	0			
Companions .. .. .	14	0	0			
						<b>91 16 0</b>
<b>„ Subscriptions (General)—</b>						
	£	s.	d.			
Members .. .. .	744	9	1			
Associate Members .. .. .	33	17	6			
Associates .. .. .	27	15	8			
Graduates .. .. .	9	0	10			
Companions .. .. .	28	15	0			
						<b>843 18 1</b>
<b>Less Subscriptions in Advance—</b>						
Members .. .. .	101	8	9			
Associate Members .. .. .	3	0	6			
Associates .. .. .	2	15	0			
Graduates .. .. .	0	18	4			
Companions .. .. .	6	14	9			
						<b>114 17 4</b>
						<b>729 0 9</b>
<b>Bristol Channel Centre—</b>						
Members .. .. .	95	1	3			
Associate Members .. .. .	4	13	9			
Associates .. .. .	0	10	0			
Companions .. .. .	14	19	3			
						<b>115 4 3</b>
<b>Less Subscriptions in Advance—</b>						
Members .. .. .	15	11	4			
Companions .. .. .	4	16	3			
						<b>20 7 7</b>
						<b>94 16 8</b>
<b>By General Revenue—</b>						<b>823 17 5</b>
Sale of Bye-Laws .. .. .	0	10	0			
„ Papers .. .. .	0	6	0			
Receipts, Billiard Table .. .. .	2	10	10			
						<b>3 6 10</b>
<b>„ Recreation Section—</b>						
Sale of Dinner Tickets .. .. .	63	15	6			
„ Conversazione Tickets .. .. .	69	3	0			
„ Tennis Club Tickets .. .. .	2	12	0			
Balance of Conversazione account, 1899 .. .. .	0	8	0			
Donation to .. .. .	1900	3	0			
						<b>138 18 6</b>
<b>„ Experimental Department Donations .. .. .</b>						<b>3 3 0</b>
<b>„ Transactions Section—</b>						
Sale of Bound Volumes .. .. .	11	3	0			
<b>„ Interest on Deposit Account .. .. .</b>						<b>5 2 5</b>
						<b>£1077 7 2</b>

## MEETINGS HELD DUR

DATE	NO. OF PAPER	SUBJECTS
1899		
February 13 ..	78	Discussion on "The Marine Engineer" .....
Do. 13 ..	80	"Electric Light-Stations" .....
Do. 20 ..	—	"Pumps and Condensers" (Lecture) .....
Do. 27 ..	80	Discussion—"Electric Light-Stations" .....
Do. 27 ..	82	Paper—"Auxiliary Machinery on Board Ship" ..
March 6 ..	—	"Incrustation and Corrosion" (Lecture) .....
Do. 13 ..	82	Discussion—"Auxiliary Machinery on Board Ship"
Do. 20 ..	—	"Casualties at Sea and Methods of Repair" (Lecture)
Do. 24 ..	—	Annual Meeting .....
Do. 27 ..	—	Discussion—"The Board of Trade Revised Regulations re Examinations of Engineers in the Mercantile Marine."
Do. 27 ..	82	"Auxiliary Machinery on Board Ship" .....
April 10 ..	—	Discussion—"Board of Trade Revised Regulations"
Do. 24 ..	82	Discussion—"Auxiliary Machinery on Board Ship"
May 8 ..	83	"A Comparison between the Performances of two Steamships."
Do. 29 ..	84	"Experiments on the Heat Absorbent Power of Water."
Do. 29 ..	83	Discussion—"The Performances of two Steamships"
June 12 ..	83	Do. do.
September 11 ..	84	Discussion—"Heat Absorbent Power of Water" ..
Do. 11 ..	83	Discussion—"The Performances of two Steamships"
Do. 18 ..	83	Do. do.
Do. 25 ..	83	Discussion—"The Performances of two Steamships"
Do. 30 ..	—	Tennis Club Social Meeting .....
October 9 ..	83	Discussion—"The Performances of two Steamships"
Do. 9 ..	85	"Objectionable Matter which tends to enter Steam Boilers, and its prevention from so doing."
Do. 23 ..	85	Discussion on ditto.
November 13 ..	85	Discussion on ditto.
Do. 15 ..	—	Annual Dinner .....
Do. 27 ..	85	Discussion—"Objectionable Matter in Boilers" ..
Do. 27 ..	86	Paper—"The Engine Room Telegraph" .....
December 11 ..	87	"Results of Experiments on the Circulation of Water"
1900		
January 8 ..	86	Discussion—"The Engine Room Telegraph" ....
Do. 22 ..	87	Discussion—"The Circulation of Water" .....
Do. 31 ..	—	Eleventh Annual Conversazione .....



## ING SESSION 1899-1900.

AUTHORS	CHAIRMAN	WHERE HELD
JAS. ADAMSON (Hon. Sec.) ..	A. Boyle .. .. .	Institute Premises,
N. APPELBEE (Assoc. Mem.)	(Chairman of Council)	58 Romford Rd., E.
J. G. HAWTHORN (Member)		Do. do.
N. APPELBEE .. .. .	Do. do.	Do. do.
E. NICHOLL, R.N.R. ..	Do. do.	Do. do.
(Member)		
J. G. HAWTHORN (Member)		Do. do.
E. NICHOLL, R.N.R. ..	Do. do.	Do. do.
(Member)		
J. G. HAWTHORN (Member)		Do. do.
—	S. C. Sage .. .. .	Do. do.
—	(Member of Council)	
	J. G. Hawthorn (Member of Council)	Do. do.
E. NICHOLL, R.N.R. ..	Do. do.	Do. do.
(Member)		
E. NICHOLL, R.N.R. ..	A. Boyle .. .. .	Do. do.
(Member)	(Chairman of Council)	Do. do.
J. D. McARTHUR (Member)	W. Lawrie (Member) ..	Do. do.
G. HALLIDAY (Member) ..	A. Boyle .. .. .	Do. do.
J. D. McARTHUR (Member)	(Chairman of Council)	
Do. do.	Do. do.	Do. do.
G. HALLIDAY (Member) ..	Do. do.	Do. do.
J. D. McARTHUR (Member)	Do. do.	Do. do.
G. HALLIDAY (Member) ..	—	Do. do.
J. D. McARTHUR (Member)	W. McLaren (Member) ..	Do. do.
J. D. McARTHUR (Member)	W. Lawrie (Member) ..	Do. do.
WALTER W. HOUFFE ..	Jas. Adamson (Hon. Sec.) ..	Do. do.
(Member)		
Do. do.	W. Lawrie (Member) ..	Do. do.
Do. do.	Do. do.	Do. do.
—	Sir J. L. Mackay, K.C.I.E. ..	The Holborn Restaurant
WALTER W. HOUFFE ..	Sir A. J. Durston, K.C.B. ..	Institute Premises,
(Member)		58 Romford Rd., E.
J. MACARTNEY .. .. .	Do. do.	Do. do.
(Vice-President)		
G. HALLIDAY (Member) ..	T. F. Auckland (Companion)	Do. do.
J. MACARTNEY .. .. .	Do. do.	Do. do.
(Vice-President)		
G. HALLIDAY (Member) ..	Do. do.	Do. do.
—	W. I. Taylor } Joint	Town Hall, Stratford, E.
	W. C. Roberts } Conveners	

The CHAIRMAN : We had hoped to have had this evening the pleasure of the company of Mr. George Sloggett, the honorary secretary of the Bristol Channel Centre, and also that of Mr. Griffiths of Southampton, but neither of these gentlemen has been able to attend. Mr. Sloggett has, however, forwarded the annual report of the Bristol Channel Centre, and I will ask Mr. Adamson to read it.

Mr. JAMES ADAMSON : Mr. Sloggett wires : "Hoped to attend annual meeting to-night, but prevented by business. Kindly do business for me and read my report."

The annual report of the Bristol Channel Centre is as follows :

## INSTITUTE OF MARINE ENGINEERS INCORPORATED.

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BRISTOL CHANNEL CENTRE.

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### ANNUAL REPORT.

SESSION 1899-1900.

UNDER the Presidentship of Sir John Gunn, Kt., the Bristol Channel Centre has had a year of success and prosperity such as no similar period in its history can show. Certainly in no previous Session has work of such a beneficial and lasting nature been recorded tending to the future development and usefulness of the Centre.

In this year commodious reading and meeting rooms have been acquired; a local trust has been formed, and the rooms handsomely furnished thereby; there has been a larger proportionate increase in membership than ever before in the same time; a

grant has been obtained from the Institute in London, and most amicable relations brought about between the Council and the Centre; while formal rules have been prepared and adopted governing the Bristol Channel Centre election and other matters. This catalogue alone embodies a considerable amount of work, but in addition several meetings have been held, also three attractive summer visits, a very successful annual dinner, and a smoking concert on behalf of the South African War Fund.

Sir John Gunn shortly after his election strongly advocated the procuring of suitable rooms for the use of the Centre. A Committee meeting was held to consider the matter, and rooms at 3 Park Place, Cardiff, were inspected. These rooms were considered so satisfactory for the purpose that it was promptly resolved to engage and furnish them. The Committee, on the initiative of Mr. George Rutherford, readily undertook to act as guarantors for the money required, pending a satisfactory arrangement with London.

With the object of obtaining pecuniary assistance from the Institute for the working expenses of the Centre, a deputation, consisting of Sir John Gunn, Mr. M. W. Aisbitt, and Mr. T. A. Reed, was appointed, and on May 4, 1899, they visited London and interviewed the Council at the Institute, Stratford. As a result of this visit the following arrangement was ultimately arrived at, viz.: That for the next three years the Bristol Channel Centre should have all annual subscriptions and a sum of £25 per annum returned; some further minor concessions were also granted.

The wise policy of the Council in acting so magnanimously has since been amply justified. Much satisfaction has been created amongst the members, and the bond existing between the Bristol Channel Centre and the Institute in London greatly strengthened. The rooms serve a useful purpose, and they are an acquisition that tends to increase the member-

ship. Many valuable presents of books and furniture have already been made to the Trustees for the use of the Members, and are placed in the rooms.

Mr. W. H. Roe, Cardiff, has been unanimously appointed Honorary Solicitor to the Bristol Channel Centre.

Mr. J. F. Walliker, with the aid of a sub-committee, has prepared rules for the Centre that were much needed, and they have been adopted.

The three Summer Visits made were :

1. Visit to the Gloucester and Sharpness Docks, Ship Canal, Berkeley Castle and District. This was probably the most interesting and successful day of the kind the Centre has ever had. The President (Sir John Gunn) with a very large attendance of Members journeyed by train to Sharpness and were met there by Sir William Marling, Bart. (Chairman of the Docks and Canal Company), and several of the Directors. Mr. Hubert Waddy, General Manager of the Company, read a paper descriptive of the Docks and Ship Canal.

2. Visit to the s.s. *Paris* at Milford. This was after the vessel had been ashore on the Manacles, near Falmouth. Mr. M. W. Aisbitt received the party and acted as guide in viewing the vessel.

3. Visit to Coumlin Viaduct and Celynen Colliery. The party descended into the coal mine and inspected the workings during the day. Mr. S. W. Allen (Member B.C.C.) read an interesting paper on bridge work and descriptive of Coumlin Viaduct.

The Ninth Annual Dinner was better attended than any previous one, and was very indicative of the increasing prosperity of the Centre. Sir Fortescue Flannery, M.P. (Past President of the Institute), presided, he having visited Cardiff expressly to attend the Dinner. During his stay he was the guest of Sir John Gunn, who was prevented by family bereavement from being present.

The Institute was represented by the Hon. Secretary and Mr. S. C. Sage (Member of Council).

A Smoking Concert of a very enjoyable kind was held towards the end of the Session, and was largely attended. A substantial sum was realised on this occasion for handing to the South African War Fund.

The order of holding the meetings will be seen from the Table appended hereto.

Mr. J. F. Walliker (Member B.C.C.) read a paper during the Session, entitled "Twenty Years' Progress in Cargo Boat Machinery."

Separate reports are furnished of the Summer Visits and the other meetings.

The Committee for the Session is composed as follows: President, Sir John Gunn, Kt.; Vice-Presidents: Mr. M. W. Aisbitt, Mr. T. W. Wailes, Mr. J. F. Walliker; Members of Committee: Mr. J. Boddy, Mr. J. Chellew, Mr. J. Fleming, Mr. D. Gibson, Mr. W. Rosser, Mr. Geo. Rutherford, Mr. W. Scott, Mr. W. Simpson, Mr. R. Williamson; Representative to Council, Mr. T. A. Reed; Honorary Treasurer, Mr. A. E. Smithson; Honorary Secretary, Mr. George Sloggett.

All of the Committee have shown great enthusiasm and unselfish devotion to the interests of the Bristol Channel Centre. They have worked unanimously for the general good, and, as must generally happen under such conditions, a satisfactory result has been attained.

On behalf of the Committee,

GEORGE SLOGGETT,

*Honorary Secretary,*

Bristol Channel Centre.

# BRISTOL CHANNEL CENTRE.

## MEETINGS HELD DURING THE SESSION 1899-1900.

DATE	SUBJECT	AUTHOR	CHAIRMAN	WHERE HELD
1899				
Feb. 15	General Meeting. Nominations made for Annual Election, and Discussion on "Auxiliary Machinery on board Ship.	Mr. Edw. Nicholl (Member)	Mr. T. W. Wailes (Vice-President B.C.C.)	Lecture Room, South Wales Institute of Engineers, Cardiff.
June 24	Summer Visit to Gloucester and Sharpness Docks, Ship Canal, and Berkeley Castle.	.. .. .	Sir John Gunn, Kt. (President B.C.C.)	Luncheon at Berkeley, Gloucester.
Sept. 9	Summer Visit—s.s. "Paris" ..	.. .. .	Mr. T. W. Wailes (Vice-President B.C.C.)	Old Milford.
Do. 23	Summer Visit to Coumlin Viaduct and Celynen Colliery. Paper on Bridge Work.	Mr. S. W. Allen (Member B.C.C.)	Mr. J. F. Walliker .. ..	Coumlin, Mon.
Oct. 2	General Meeting. Opening of New Rooms for Bristol Channel Centre at 3 Park Place, Cardiff.	.. .. .	Sir John Gunn, Kt. (President B.C.C.)	Bristol Channel Centre Rooms, 3 Park Place, Cardiff.
Do. 28	Ninth Annual Dinner .. ..	.. .. .	Sir Fortescue Flannery, M.P. (Past Pres. Institute M.E.)	Banqueting Hall, Royal Hotel, Cardiff.
1900				
Feb. 1	Paper, "Twenty Years' Progress in Cargo Boat Machinery."	Mr. J. F. Walliker (V.-President B.C.C.)	Mr. T. W. Wailes (Vice-President B.C.C.)	Bristol Channel Centre Rooms, 3 Park Place, Cardiff.
Do. 7	General Meeting to pass Rules for Bristol Channel Centre, and make Nominations for the Annual Election.	.. .. .	Mr. J. F. Walliker (Vice-President B.C.C.)	Do. do.
Do. 15	Discussion, "Twenty Years' Progress in Cargo Boat Machinery."	.. .. .	Mr. M. W. Aisbitt (Vice-President B.C.C.)	Do. do.
Do. 24	Smoking Concert. Proceeds given to South African War Fund.	.. .. .	Mr. T. W. Wailes (Vice-President B.C.C.)	Lesser Park Hall, Cardiff.
Do. 28	Discussion closed on "Twenty Years' Progress in Cargo Boat Machinery," and Paper read on "Boiler Water Impurities."	J. F. Walliker .. W. W. Houfe ..	Mr. M. W. Aisbitt (Vice-President B.C.C.)	Bristol Channel Centre Rooms, 3 Park Place, Cardiff.

The CHAIRMAN: I will now ask Mr. Shorey, the honorary treasurer, to present the financial statement.

The HON. TREASURER: I think you will all be pleased to know that our income has exceeded our expenditure this year and that we close the year with a credit balance of £180 10s. 8d. For your information I have an analysis here showing the increase or decrease in the principal items of the revenue account, as compared with the previous year, and if you will follow me I will tell you what the chief differences are. First, as to the income. In entrance fees there is an increase of £8 11s., that is the increase in the year ended January, 1900, as compared with the year ended January, 1899. In subscriptions there is an increase of £182 16s. 11d.; General revenue, 17s. 11d. decrease; Transactions, decrease, £8 15s. 5d; Interest on deposit, £5 2s. 5d. increase; Donations to library, £4 2s. decrease; Drawing classes, decrease, £4 5s. 5d; Total decrease in the receipts this year over last year, £18 0s. 9d., and the total increase, £196 10s. 4d., making the net increase in income for the year, £178 9s. 7d. Now we go to the expenditure. General expenses, increase, £20 10s. 10½d; Rates and taxes, increase, £1 4s.; House account, increase, £15 0s. 7½d.; Advertisements, decrease, £2 10s.; Depreciation, decrease, 13s. 9d.; Reading room expenses, increase, 13s.; Papers and discussions, decrease, £119 10s. 10d.; Recreation section, increase, £63 2s. 3½d.; Transactions section, increase, £3 0s. 6d.; Bristol Channel centre, increase, £94 8s. 10d.; Southampton centre, decrease, £14 13s. 9d.; Experimental department expenses, increase, £4 9s. 4d. The total decrease in the expenditure is £137 8s. 4d., and the total increase £202 9s. 8d., so that the net increase in our expenditure as compared with last year is £65 1s. 4d. You will see we have been spending a little more money, and the way in which we arrive at the balance of £180 10s. 8d. shown in the revenue account is as follows: Difference

between income and expenditure, £113 9s. 3d.; balance brought forward, £67 2s. 5d. I do not think that I have any more to say, but if there is any question that any member would like to ask, I will do my best to answer it.

Mr. R. LESLIE: I have very great pleasure in proposing that the annual reports and financial statement be adopted. Except as to the Southampton Centre, the annual report of the Council that has just been read, is a very good one throughout. It is a pity that the Southampton Centre has not been doing so well as it ought, but that circumstance is certainly overbalanced by the success of the Bristol Channel Centre which seems to be doing extremely well. I do not know that I need say any more on the subject, and I propose that these reports together with the financial statement be adopted.

Mr. J. E. ELMSLIE: I have very great pleasure in seconding the motion. Both the reports and the accounts seem to be exceedingly satisfactory, and show the institution to be making substantial progress.

The CHAIRMAN: Before putting this motion I may say that there has been a great decrease in the expenditure in reference to the printing and publication of papers and discussions. I think we shall all regret that. We have not had quite so many papers in the past year as in the previous years, but we hope to have more next year. I feel that this is an item of expenditure which we do not want to see diminished in any way. It is an expenditure that we are all anxious to see increased rather than decreased. Another feature of the accounts is that the expenses of the Bristol Channel Centre have much increased, but that increase is more apparent than real, and against the increase we have to put the fact that the Bristol Channel Centre now defray all their local expenses. It is very pleasing to find that the Bristol Channel Centre is so satisfied with the arrangement



that has been made. They defray all the local expenses.

The HON. SECRETARY: With reference to this matter there are a few words that appear to have slipped out of the report. In addition to the return of the annual subscriptions received from the Bristol Channel Centre we also give them a grant of £25 a year for three years. Perhaps Mr. Leslie will kindly allow me to include those words in my report from which they have slipped out. We give the Cardiff Centre a grant of £25 a year for three years besides returning all the annual subscriptions, and we retain all the entrance fees.

Subject to the insertion in the Council's report of the words indicated by Mr. Adamson, the motion was carried unanimously.

Mr. S. C. SAGE: I rise with very great pleasure to propose a hearty vote of thanks to our retiring President, Sir James Mackay. I think that with regard to its Presidents, this Institute has established a record, and we are greatly indebted to those gentlemen of eminence who, year after year, have occupied the position of head of this institution, and lent us the honour of their distinguished names and attention. It is only proper and right that we should record our sense of the valuable services which they have rendered us, and I have therefore very great pleasure in proposing a hearty vote of thanks to our retiring President for his services during the past year.

Mr. J. R. RUTHVEN: I have very great pleasure in seconding that vote of thanks.

The motion was carried by acclamation, the whole of the members present standing.

Mr. W. McLAREN: I have great pleasure in rising to move a vote of thanks to the office bearers and members of Council, and there is no doubt that the work done by these gentlemen is not known to the

members generally, although I hope they will be able to read about it when the annual report goes out after this meeting. One point to which I should like to call the Council's attention is the attendance of the members at the ordinary meetings for the reading and discussion of papers. We should very much like to have the presence of more members at those meetings.

MR. A. SLATER: I have much pleasure in seconding the motion. I think the whole of the members will agree that we owe a deep debt of gratitude to all these gentlemen for their devotion to the affairs and welfare of the Institute.

The motion was carried unanimously.

THE CHAIRMAN: My name is down to respond to this vote, although when the programme was arranged it was not expected that I should be in the chair. I can only say that I thank Mr. McLaren very much for the kind way in which he proposed this vote of thanks, and also Mr. Slater for the way he endorsed what Mr. McLaren had said. Speaking on behalf of the Council I will only say that we appreciate very much the support and approval of the members. Without that support and approval our labours would be very difficult indeed, but with your approbation any amount of labour or work will be thought nothing of. I may further say that the policy and spirit of the Council are solely dictated by an anxiety for the best interests and welfare of the Institute, and I can only express a hope that the value of the Institute to the members and the support given to the Institute by marine engineers will be increased more and more as time goes on.

MR. J. T. SMITH proposed a hearty vote of thanks to the auditors, Mr. J. B. Johnston and Mr. T. F. Aukland.

MR. McINDEWAR seconded the motion which was at once agreed to.

The HON. SECRETARY : Mr. Johnston, one of the auditors, wires to say that he is confined to his house by illness, and Mr. Aukland has been prevented by business from attending this evening. We know that we have the sympathy of Mr. Aukland from his frequent attendance at our meetings. He has been most exemplary in carrying out the view laid before us to-night by Mr. McLaren, and I hope that every member will lay it to heart.

Mr. F. W. SHOREY : I have very much pleasure in proposing a cordial vote of thanks to our honorary solicitor. He has not had much work to do for us during the past year. We are a very happy family as a rule, but sometimes matters arise in regard to which we require a little legal assistance. However, he is not troubled more than we can possibly help, and for what he has done, and for what he would have done for us if called upon, I have very much pleasure in proposing a hearty vote of thanks.

Mr. C. NOBLE seconded the motion, and it was at once agreed to.

Mr. J. R. RUTHVEN : The subject which I have been asked to bring before you is one that has already been alluded to by the Chairman and also by Mr. McLaren. I wish to say a few words on the subject of the Papers. They are not coming in from the members, associate members, associates and graduates as in former years. It is not that we have exhausted the subjects, that can never be the case; but there seems to be a disinclination to take the trouble to write a paper. Laziness is the root of all evil. But there is still some hope; I will tell you what the Council is willing to do. Many members think that they cannot write what they have in their minds. They have lots of ideas and experiences to relate. Now here is an opportunity to have your papers written; here you can have the advantages of a Prime Minister; an expert shorthand writer will

write your papers for you, and if this will not tempt you, I don't know what will.

Now, with regard to the attendance at meetings. Here you can have the advantage of having any technical questions answered by men actually engaged daily upon them. I am very sorry that so few members take advantage of the enormous amount of material which is at their service in connection with this Institute, and that is a point which I specially desire to impress upon members to-night.

The CHAIRMAN : I am sure we are all indebted to Mr. Ruthven for what he has said. Mr. Ruthven is the Convener of the Papers Committee, and he is very anxious to have more work to do. I appeal to you to keep Mr. Ruthven more occupied in the future than he has been in the past.

The SCRUTINEERS then submitted the result of their examination of the ballot papers and reported that the voting by the members had resulted in the election of the following Office Bearers and Members of Council for the ensuing year—

PRESIDENT :

Colonel John Denny, M.P.

HON. TREASURER :

Mr. F. W. Shorey.

HON. SECRETARY :

Mr. James Adamson.

MEMBERS OF COUNCIL :

Mr. J. T. Smith.

Mr. J. G. Hawthorn.

Mr. J. W. Richardson.

Mr. S. C. Sage.

Mr. J. R. Ruthven.

Mr. W. Lawrie.

Mr. W. McLaren.

Mr. A. H. Mather.

HON. MINUTE SECRETARY :

Mr. C. G. Newby.

With regard to the Bristol Channel Centre, the

Scrutineers reported that the voting had resulted in the election of the following—

PRESIDENT :

Sir John Gunn.

VICE PRESIDENT :

Mr. T. W. Wailes.

HON. SECRETARY :

Mr. George Sloggett.

HON. TREASURER :

Mr. A. E. Smithson.

REPRESENTATIVE TO COUNCIL :

Mr. T. A. Reed.

MEMBERS OF COMMITTEE :

Messrs. D. Gibson, J. Fleming and J. Boddy.

Mr. F. W. SHOREY : Since you have done me the honour of re-electing me as your honorary treasurer, allow me to take this opportunity of thanking you. If any of you would like to look into the books at any time they are always open for your inspection.

Mr. A. H. MATHER : I have very much pleasure in proposing a hearty vote of thanks to the two gentlemen who have acted as scrutineers—Mr. Adam and Mr. Anderson. The overhauling of these voting papers and making out a statement of the result involves a considerable amount of labour, not of a very exciting or attractive kind, and they are certainly entitled to our thanks. I see that the members have done me the honour of electing me a member of Council. The honour was entirely unexpected, but as the members have elected me will you allow me to say that I will attend the meetings as far as possible, and that I will try and do the best I can to help forward any work that may come to my share.

Mr. W. LAWRIE seconded the motion which was put and carried, and

Mr. J. C. ANDERSON in acknowledging the vote said : Our only regret is that the members have not made

our task much harder. The percentage of members who have sent in their voting papers is too small. However, I thank you on behalf of my colleague and myself for your recognition of our services.

Mr. J. BLELLOCH proposed that Mr. Hulme and Mr. A. Brown be appointed auditors, and the motion having been seconded by Mr. Howie was put and carried.

Mr. HULME and Mr. BROWN both accepted the appointment, and said they would endeavour to carry out the work conscientiously.

The CHAIRMAN: We shall now be pleased to hear any gentleman who has any remarks to make about the work of the Institute generally. We shall be glad to receive any suggestion that any member may have to offer the Council for the improvement of our position or work in any way. We all hope that the Institute will go on and flourish. I believe it will, and that others who come after us will continue our work.

Mr. C. NOBLE: One or two members have asked me to make a statement or suggestion about the voting papers that are issued. It is suggested that it would be preferable if the voting papers were so framed that members would only have to put a X against the names of those for whom they desired to vote.

Mr. J. R. RUTHVEN: There is something in that. It would simplify matters certainly.

The CHAIRMAN: You see there is no limit of choice, and any member can vote for any other member.

Mr. F. W. SHOREY: If a member cannot write down half a dozen or a dozen names once in twelve months I am afraid we are degenerating.

Mr. A. HULME: Being marine engineers we are in many cases at sea, in more senses than one, as to who would be suitable members to elect on the Council, and therefore some of us think it desirable

not to fill up the papers but leave it to those who have a knowledge of the most suitable for the offices.

The CHAIRMAN : Every member has a right to vote for any one he pleases. He can add any name he thinks fit.

Mr. S. C. SAGE : With regard to these voting papers, it has been the subject of a good many years' consideration—the way in which these proposals should be put forward—and of course what Mr. Hulme has said is very much to the point. There are certain members of the Council who retire each year by rotation and who are eligible for re-election. Those names are put forward or such of them as are willing to be re-elected, and then certain other names are submitted by the Council for the consideration of the members along with the retiring members of the Council. That proves that the Council have done what Mr. Hulme has indicated in suggesting the names of certain members whom we know, by virtue of being engaged ashore, are in a position to undertake the duties. But it is possible for any member of the Institute to nominate any other member, or nominate himself for the position of member of Council. We are always willing to receive suggestions, and adopt them if they are practicable, but unless some much better system can be proposed, which I am sure will receive the careful consideration of the Council, the procedure adopted now and for years previously is, I think, a very good one.

Mr. R. LESLIE : I quite agree with what Mr. Sage has said. Any member who may be at sea knows very well that the names put forward on the paper have been selected by a practical Council, and if he is at a loss what names to put down, he can put down any five or six of the names on the paper. Surely a member can spare five minutes once in twelve months to do a small job of that kind. There can be no difficulty about it because all the names put

forward are eligible. All the member has to do is to write in five or six of those names, and whatever names he selects he is practically certain to be right. I should object to any alteration in the system, because if any member knows a good man whose name is not on the list he is quite at liberty to put it forward. You could not get over the difficulty by adopting the suggestion that has been made to-night without putting down on the list the names of the whole of the members of the Institute.

Mr. RUTHVEN: Might it not be permissible for the general membership to send in the names of suitable candidates so that we might have a larger selection? If members would take the trouble to send in names I think the proposals would be favourably received.

Mr. G. HALLIDAY: I was just going to make the same suggestion as Mr. Ruthven who has taken the words out of my mouth. Would it not be well for the Council to give us some date before which proposals may be sent in? So far as I am concerned, I have never heard the time for sending in the names of any members who may be suggested for election. With regard to the reports of the discussions on papers that are printed in the Transactions, I should like to know if those reports are sent to the various speakers for revision, and if not, I would suggest that they should be sent to each speaker so that he may have an opportunity of revising his contribution before it is printed in the Transactions.

Mr. J. T. SMITH: With regard to the voting papers for members of Council the choice is rather restricted because members object to have their names put forward year after year. The reason that fewer names are put forward is that gentlemen do not wish their names put down time after time when they are not elected.

Mr. W. McLaren: Will there be any advantage in continuing to notify the members of our meetings?



It has been a great pleasure to be present when the attendance has been good and it has occurred to me whether there could be some other means of notifying the members of our meetings; whether there could be some other means of inducing members to attend these meetings and help us in the discussions.

The CHAIRMAN: We have been sending notices to members for the meetings during this winter, giving the subject for consideration on each evening.

Mr. McLAREN: I do not doubt that the notices are sent, but have we gained any advantage from being at the expense of those notices?

The CHAIRMAN: Yes, I think so. Note has been taken of what has been said in reference to the voting papers, and also in reference to the attendance at our meetings. Mr. Adamson will embody both those points in the report of this meeting and they will be brought prominently before the members. The remarks of Mr. McLaren as to increasing the numbers of those who attend our ordinary meetings are, I think, very important. A member who attends here not only benefits himself by what he hears, but benefits others by what he is able to say on the subject under discussion.

Mr. NOBLE: I do not think it would be out of place to give in our annual report the number of attendances made by the members of Council. It would give us some idea and be some guide in electing members, if we could see how they had attended.

Mr. JAMES ADAMSON said: I rise to again endorse the views expressed by Mr. McLaren. So far as the annual report is concerned, the desirability of having better attendances was very clearly laid down at our annual meeting last year, both in reference to council meetings and at the discussions on the papers. I do not think that I can add anything more, and I am sorry that the matter has again to be brought before us after the lapse of a year. No doubt, as

Mr. Boyle has suggested, there has been a great amount of sickness among our members during the winter, and that has affected our attendance, but I have been pleased to see that our attendance has been better since the postcards were issued reminding also each member he can invite a friend, and I think that that system ought to be kept up and perhaps extended. Mr. Ruthven has tried to get in the thin end of the wedge in urging that members should send in their views in writing to the Council, and if members would only write out half a dozen lines we should be very glad to receive them. I commend Mr. Ruthven for his suggestion and hope it will bear fruit. I do not know that we could very much improve our present system of issuing the voting papers. I quite endorse the views of Mr. Leslie and Mr. Smith in regard to a large number of names on the list.

As to the reports of the discussions, referred to by Mr. Halliday, any member who wishes can have a revise of the remarks he may have made at any meeting. I often get notes from members sending extended remarks that have occurred to them subsequent to the discussion in which they have taken part. We also have remarks sent in by members in writing after the discussions have been closed, so that it is always competent for any member to send in his remarks in manuscript if he would prefer it; that is the system we adopted from the start of the Institute. In the first year or two I made it a point to write the report of every meeting the Institute held, and this was copied and a copy sent to the different newspapers, and we as an Institute benefited very largely in consequence. The necessity for such a course is happily at an end and we can afford other measures. We are richer, we are known, and now the reports of our meetings are courted by the different papers, whereas when the Institute started we had to take some little trouble in order to get our proceedings reported. Members will see that it would be impossible to communicate with every member who takes part

in the discussions, as many who have spoken may be upon the ocean, and it would be impossible to communicate with those members so as to enable the Transactions to be issued within a reasonable time; indeed we should never get through the work. Any member who has taken part in a discussion ought to know—and I am glad Mr. Halliday has mentioned this that I may say—that any member may and is invited to send in his remarks in writing, and I should prefer that myself as although every care is taken to make his observations clear and correct, sometimes a member may not be reported as he would himself like, although I have had notice of such. The following letter has just come to hand from the Institution of Civil Engineers.

INTERNATIONAL ENGINEERING CONGRESS,  
GLASGOW, 1901.

LONDON COMMITTEE.

SIR,—I am directed by a resolution passed at a meeting of Engineers held here on the 7th inst., Sir Douglas Fox in the chair, to convey an invitation to the Institute of Marine Engineers to appoint two representatives to act upon a London Committee of the International Engineering Congress to be held in Glasgow in 1901.

The meeting referred to, which was called at the request of a Glasgow Committee charged with the preliminary arrangements for the Congress, was of opinion that a London Committee, to which the Glasgow Executive Committee of the Congress might apply for assistance and advice, should be formed forthwith.

The general scheme of the Congress—which is to be held in August, 1901, in the buildings of the University of Glasgow, adjacent to the grounds of the International Exhibition—is indicated on the enclosed sheet. The programme will consist of meetings, visits to Engineering works in Glasgow and the neighbourhood, and gatherings of a social character.

It will be seen that members of the London Committee will not be expected to perform executive functions in connection with the Congress, though they will be members of the General Committee and will be represented upon the Executive Committee in Glasgow.

I shall be glad to learn at your convenience whether the Institute of Marine Engineers will acquiesce in this request for the nomination of two representatives upon the London Committee, with the names of those who may be proposed.

I have the honour to be, Sir,  
Your obedient Servant,  
J. H. T. TUDSBERY.

*March 14th, 1900.*

This letter has been delivered at a very appropriate time, and it will remain to be considered by the new Council.

Mr. HULME: I have very much pleasure in proposing a hearty vote of thanks to our Chairman.

Mr. HALLIDAY seconded the motion which was carried unanimously.

The CHAIRMAN having briefly replied the meeting terminated.

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58, ROMFORD ROAD,  
STRATFORD,

*April 2nd, 1900.*

The following appointments have been made by the new Council for Session 1900-1: Chairman, Mr. A. Boyle; Vice-Chairman, Mr. J. T. Smith; Representatives to the London Committee in connection with the Glasgow Exhibition of 1901, Messrs. W. C. Roberts and Jas. Adamson.

## ADDITIONS TO INSTITUTE LIBRARY,

1899 AND 1900.

NO.	DESCRIPTION	PRESENTED BY
659	Engine Room Practice (J. C. Leversedge, R.N.)	C. V. Harcastle, R.N.
660	The Naval Annual (T. A. Brassey)	J. H. Watson, R.N.
661	Patent Water-Tube Marine Boilers (Babcock and Wilcox)	The Author
662	Official Year Book of Scientific and Learned Societies	Purchased
663	Transactions, Liverpool Engineering Society, vol. 20	The Council
664	Engineering, vol. 17, Jan. to June, 1874	F. S. Wiles
665	Engineering, vol. 18, July to Dec., 1874	do.
666	Engineering, vol. 19, Jan. to June, 1875	do.
667	Engineering, vol. 20, July to Dec., 1875	do.
668	Engineering, vol. 21, Jan. to June, 1876	do.
669	Engineering, vol. 22, July to Dec., 1876	do.
670	Engineering, vol. 23, Jan. to June, 1877	do.
671	Engineering, vol. 24, July to Dec., 1877	do.

NO.	DESCRIPTION	PRESENTED BY
672	Transactions, Institution of Naval Architects, 1899	The Council
673	Fowler's Mechanical Engineer's Pocket Book, 1900	The Author
674	N.E. Coast Institution of Engineers and Shipbuilders, vol. 15	The Council
675	Institution of Engineers and Shipbuilders in Scotland, vol. 42	do.
676	Lord Kelvin, 1846-1899 . . .	W. I. Taylor (Member)
677	Transactions, Institute of Marine Engineers, vol. 10	The Council
678	The Drainage of Habitable Buildings (W. Lee Beardman)	C. W. Barnes (Associate)

## PRESENTED TO THE INSTITUTE.

DATE	DESCRIPTION	PRESENTED BY
Oct. 1, 1899	Framed Photo. H.M.S. <i>Desperate</i>	J. S. Gibson Sugars, R.N., Member.
Jan. 23, 1900	Two Framed Photos. of Marine Engines and Feed-water Heaters	The N.E. Marine Engineering Co.

THE FOLLOWING PAPERS HAVE BEEN CONTRIBUTED  
TO THE READING ROOM DURING THE SESSION  
1899-1900.

DESCRIPTION	PRESENTED BY
Scientific Societies' Year Book	Purchased.
Engineering ... ..	do.
Engineer ... ..	do.
The Illustrated London News...	do.
The Graphic ... ..	do.
Shipping Gazette (Weekly) ...	do.
Naval List ... ..	do.
Stratford Directory ... ..	do.
Post Office Guide ... ..	do.
The Steamship ... ..	do.
The Syren and Shipping ...	do.
The Mechanical Engineer ...	The Proprietors.
The Marine Engineer ... ..	do.
The Practical Engineer...	do.
The Mariner ... ..	do.
The Shipping World ... ..	do.
Ice and Cold Storage ... ..	do.
Indian and Eastern Engineer ...	do.
Cold Storage ... ..	do.
Mechanical World ... ..	do.
Industries and Iron ... ..	do.
The Iron and Coal Trades'	do.
Review.	
The Engineers' Gazette ...	do.
The Automotor and Horseless	do.
Vehicle Journal.	
The Railway and Engineering	do.
Review.	
The Engineering & Iron Trades'	do.
Advertiser.	

DESCRIPTION	PRESENTED BY
The Sibley Journal of Mechanical Engineering.	The Proprietors.
El Ingeniero (Español)	do.
The American Society of Civil Engineers.	The Council of the Society.
Transactions Institution of Mechanical Engineers.	The Council of the Institution.
Transactions Institution of Engineers and Shipbuilders in Scotland.	do.
Transactions Sociétés Ingénieurs Civil de France.	The Council of the Society.
Bulletin de l'Association Technique Maritime.	The Council of the Association.
Revue Maritime (French) ...	The Council.
The Times of India ...	W. W. Wilson (Member).
West Ham Library Notes ...	The Librarian.
Feilden's Magazine ...	The Proprietors.
Mechanical Engineer ...	do.
British Refrigerator ...	do.
Marine Engineering, U.S.A. ...	do.
Fairplay ... ..	W. I. Taylor (Member).
Post Office London Directory, 1899.	do.



# INSTITUTE OF MARINE ENGINEERS, INCORPORATED.

*Founded February, 1889.*

*Incorporated July, 1889.*

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## MEMBERS.

MADE UP TO APRIL, 1900.

NO.	NAME	ADDRESS
1343	Aborn, G., R.N.	H.M.S. <i>Sutlej</i> , Glasgow, N.B.
13	Adam, R.	B. I. S. N. Co., R. A. Docks, E.
1408	Adams, Geo.	241, High Road, Leyton, E.
407	Adams, J. G.	46, Stuart Rd., Walton, Liverpool
1	† Adamson, Jas.	9, Stopford Rd., Upton Manor, E.
259	Adamson, John	1, Selbourne Gardens, York Rd., Ilford, Essex
1301	Agate, C.	"Ashtead," Emsworth, Hants
674	Aisbitt, M. W.	47, Mount Stuart Square, Cardiff

† Life Member by Election.

NO.	NAME	ADDRESS
443	Aitken, J. K.	c/o East London Harbour Board, East London, S. Africa
1213	Aitken, John	41, Clayton Park Sq., Newcastle- on-Tyne
1231	Aitken, R. H.	"Holly Bank," Dalry, Ayr, N.B.
1203	Alder, S.	
408	Alder, W. G. B.	56, Jamaica Street, Liverpool
562	Allan, J.	15, Clydeford Drive, Uddington, N.B.
736	Allen, S. W.	Exchange Buildings, Cardiff
85	Allison, A. C.	B. I. Engineers' Club, Calcutta
515	Anderson, C.	Windygates, Fifeshire, N.B.
302	Anderson, C.	Port Trust Office, Bombay
1197	Anderson, J. C.	49, Hornsey Lane Gardens, Highgate, N.
276	Anderson, S.	7, Vaughan Road, Romford Road, Stratford, E.
42	Anderson, T.	3, Derby Road, Liverpool
1285	Andlau, W. F.	North Front Water Works, Gibraltar
351	Annal, J.	P. & O. S. N. Co., R. A. Docks, E.
538	Appleton, J. J.	5, Church Row, Stockton-on- Tees
1282	Armstrong, R. B.	c/o Messrs. Day, Summers & Co., Southampton
797	Arthur, H. P.	"Kertch House," Queen's Park, Southampton
1332	Ash, H. E. H., R.N.	H.M.S. <i>Pembroke</i> , Chatham
785	Atkins, G. W.	"The Palmers Villa," Elstree, Herts
778	Axford, T. M.	9, London Street, E.C.
1036	Axworthy, S.	7, Central Park Road, East Ham, E.
724	Baggallay, R.	9, Fenchurch Street, E.C.
31	Baker, W. H.	1, Selbourne Road, Ilford, E.

NO.	NAME	ADDRESS
364	Balfour, R.	Lloyd's Registry of Shipping, Sunderland
592	Ballantyne, J.	46, Gladstone Rd., West Ham, E.
982	Balsillie, W.	4, Greenside Place, St. Andrews, N.B.
860	Banks, J. J.	"Salamis," Gordon Avenue, Southampton
929	Bapty, G. F. W.	37, South St., Greenwich, S.E.
288	Barbour, P.	86, Windsor Rd., Forest Gate, E.
64	Barclay, W.	13, Salisbury Rd., Forest Gate, E.
40	Barringer, H.	Keston Grove Park, Wanstead, E.
1303	Bartle, G. W.	146, Claremont Road, Forest Gate, E.
418	Baxter, T. A.	Black Park, Stranraer, N.B.
1054	Beavis, A.	73, Clifford Street, Southampton
2	Beldam, A.	"The Lodge," Acton, W.
508	Bell, J., R.N.R.	31, Tynemouth Road, South Tottenham, N.
1136	Bell, T. R.	129, Romford Road, Stratford, E.
1313	Bendell, E.	Carlton Place, Kilmalcolm, N.B.
398	Bennet, J. M.	Luss, Loch Lomond, N.B.
1196	Bertram, H.	17, Clayton Park Square, New- castle-on-Tyne
1020	Bethell, E.	42, Ravensbourne Road, St. John's, S.E.
1095	Bigmore, J.	"Forest Cottage," Chigwell Row, Essex
230	Birkett, W., R.N.R.	"Lowood House," 56, Dacre Road, Plaistow, E.
1289	Birtley, J. G.	29, Plasterston Avenue, Cardiff
506	Black, Blair	185, Palmerston Buildings, E.C.
799	Black, H. M.	108, Oxford St., Southampton
1307	Black, Jas.	No. 1, Dry Dock, Southampton
651	Black, W.	Peruvian Government, Callao
1330	Black, W. J., R.N.	H.M.S. <i>St. George</i> , Portland

NO.	NAME	ADDRESS
644	Blackett, J.	30, Pepys Road, New Cross Gate, S.E.
57	Blair, A.	63, Billiter Buildings, London, E.C.
260	Blake, J.	193, Romford Rd., Stratford, E.
245	Blelloch, J.	56, Cecil Road, Plaistow, E.
1222	Blow, W.	108, Wyndham Crescent, Canton, Cardiff
1353	Boak, W.	2, Farren's Road, Perambore, Madras, India
665	Boddy, J.	"Orwell Villa," Caeran Park, Newport, Mon.
1180	Boden, G. C.	"Bella Donna," Bevois Hill, Southampton
989	Boden, W. J. H.	"Bella Donna," Portswood Rd., Southampton
662	Bond, J.	278, Cowbridge Road, Cardiff
984	Borland, A.	5, Northcote Terrace, Murchison Road, Leyton, E.
1079	Bowden, H. J.	4, Stafford Terrace, Plymouth
631	†Bowen, Ed.	Porto Alegre & New Hamburg Railway Co., Rio Grande do Sul, Brazil
1342	Boyd, A.	93, Cohun Road, Cardiff
312	Boyd, D. D.	B. I. Engineers' Club, Calcutta
15	Boyd, P.	B. I. S. N. Co., R. A. Dock, E.
1300	Boyle, A., R.N.R.	105, Wallwood Road, Leytonstone, E.
1162	Brabbon, Alf.	13, Stratford Grove, W. Heaton, Newcastle-on-Tyne
1115	Bray, G. E.	49, Connington Road, St. John's, S.E.
446	Brett, W. J. N.	"Hopetoun House," Margery Park Rd., Forest Gate, E.
1220	Brewer, H.	5, Northcote Street, Cardiff
716	Brock, H. W.	Engine Works, Dumbarton, N.B.

† Life Member.

NO.	NAME	ADDRESS
343	Brock, Walter	Leven Ship Yard, Dumbarton, N.B.
498	Brock, Wm.	"Ava Bank," Dumbarton
733	Brolly, A. B.	Occidental & Oriental S.S. Co., San Francisco, America
1169	Brough, W. H.	57, Harold Rd., Upton Park, E.
1098	Brown, A. A.	4, Milton Road, Southampton
68	Brown, A. B.	Rosebank Ironworks, Edin- burgh
826	Brown, Alex.	2, Vectis Terrace, Brunswick Place, Southampton
166	Brown, L.	B. I. S. N. Co., Bombay
133	Bruce, R.	77, Billiter Buildings, E.C.
142	Brydon, J. M.	142, Kyverdale Rd., Stamford Hill, N.
783	Buchanan, C.	Indo-China S. N. Co., Shanghai
34	Buckley, W.	"Springleigh House," Sharrow, Sheffield
224	Buckwell, G. W.	Board of Trade Surveyor's Office, Sunderland
1183	Budge, W.	c/o Institution of Engineers and Shipbuilders, Hong Kong
1189	Buley, Jno.	Suffolk House, Laurence Pount- ney Hill, E.C.
291	Bull, A. B.	18, "Albert Villas," Albert Avenue, Hull
862	Bullen, E.	Pear Tree Green, Southampton
1151	Butler, D. C.	5, Carden Road, Peckham Rye, S.E.
1121	Caird, Alex.	248, High Street, Arbroath, N.B.
359	Caird, E. B.	777, Commercial Road, E.
882	Caird, P. T.	Greenock, N.B.
713	Callan, W.	2, Coleman Street, E.C.
181	Cambridge, H.	Mount Stuart Square, Cardiff

NO.	NAME	ADDRESS
175	Camelleri, A.	93, Freemason Road, Custom House, E.
1085	Cameron, J., R.N.R.	"Glenmore," Lonsdale Road, Wanstead
214	Campbell, Alex.	45, Langham Rd., West Green, N.
22	Campbell, Arch.	P. & O.S.N.Co., R.A. Docks, E.
1044	Campbell, J. W.	16, Colvin Rd., Heigham Rd., East Ham, E.
525	Campbell, Neil	"Kirklyston," Rangers Avenue, Sydney, N.S.W.
1049	Campbell, P. T.	23, Cambridge Rd., Wanstead, Essex
1099	Campbell, T.	"Belle Villas," Corbett Road, Cardiff
871	Cannell, F. C.	c/o Messrs. H. Parry & Son, Lisbon
394	Carlisle, H.	Eagle Foundry, Sheffield
990	Carney, J. H.	"Glengariffe," Stow Park, Newport, Mon.
277	Cassap, J. H.	103, Claude Rd., Roath, Cardiff
963	Castle, J. P.	6, Burlington Gdns., Chiswick, W.
732	Chellew, J.	Plymouth Rd., Penarth, Cardiff
915	Chicken, T.	40, Alma Street, Newport, Mon.
77	Chisholm, H., R.N.R.	P. & O.S.N. Co., R.A. Docks, E.
1263	Clapham, W.	17, Wilmer Rd., Manningham, Bradford, Yorks
704	Clark, John	12, Harold Road, Upper Norwood, Surrey
800	Clark, J.	"Cedar View," Avenue Road, Southampton
139	Cleghorn, G.	B. I. Engineers' Club, Calcutta
955	Clutterbuck, H.	London C. C., Spring Gardens, S.W.
1160	Coe, A. E.	69, Compton Avenue, East Ham, E.

NO.	NAME	ADDRESS
964	Cole, H. A. B.	79½, Gracechurch St., London
560	Collings, J. W.	3, Aberdeen Road, Croydon, Surrey
1108	Cooke, A.	36, Argyle Road, Ilford, Essex
688	Cooke, H. J.	
801	Coomber, R. W.	
171	Corns, F. A.	39, Newich Rd., Clapton, N.E.
1286	Cooper, F., R.N.R.	Belgrave Rd., Newcastle-under- Lyme
196	Cotton, W. J.	
52	Cowan, J.	"Sandmill," Sandhead, Stran- raer, N.B.
1348	Crabtree, W. F.	Southtown Iron Works, Great Yarmouth
759	Craig, J. C.	76, Disraeli Rd., Forest Gate, E.
4†	Craig, W. J.	"Pendower," 53, Earlam Grove, Forest Gate, E.
93	Crawford, D.	101, Barclay Road, Waltham- stow, E.
269	Crawford, D.	"Woodhead Cottage," Lam- lash, Arran, N.B.
949	Crichlow, W. G.	60, Norfolk Road, Ilford, E.
74†	Crichton, A. G.	18, Atherton Rd., Forest Gate, E.
287	Crichton, J. G., R.N.R.	P. & O. S. N. Co., R. A. Docks, E.
512	Croft, J.	130, St. Stephen's Road, Upton Park, E.
127	Crook, C. A.	58, Tyrwhitt Road, St. John's, S.E.
966	Cropley, W.	52, Knox Road, Forest Gate, E.
322	Cross, A. N.	23, Tylney Rd., Forest Gate, E.
1272	Cruickshank, W. D.	Marine Board Office, Sydney
1117	Cunningham, D. M.	"The Cottages," Mill Road, Bathgate, N.B.
1113	Currie, W. G.	25, Tancread Road, Anfield, Liverpool

† Life Member by Election.

‡ It is with deep regret we have to record the death of A. G. Crichton on April 24th, 1900.

NO.	NAME	ADDRESS
796	Cuthill, Alex.	70, Burngreave Road, Sheffield
18	Daglish, J.	13, Church Street, Walker-on-Tyne
854	Dance, C. M.	Sprowston Dock, British Guiana
1090	Daniel, N. T.	30, Mount Stuart Square, Cardiff
43	Daniels, A.	9, Rosslyn St., Aigburth Rd., St. Michael's, Liverpool
1235	Davidson, C. J.	"St. Gothard," Prince's Road, Lewisham, S.E.
819	Davie, H. A.	3, St. Bede's Park, Sunderland
347	Davison, R.	96, Llandaff Road, Canton, Cardiff
511	Davison, W. R.	"Rosedale," Wallwood Road, Leytonstone, E.
849	Day, A. J.	Northam Iron Works, South- ampton
834	Day, G. C.	"Terrace House," Southampton
802	Daye, H.	134, Gordon Avenue, Southamp- ton
168	Deighton, T.	79, Dalberg Rd., Brixton, S.W.
658	Denny, Jas.	Engine Works, Dumbarton, N.B.
1118	Denny, J. L.	c/o Messrs. Russell, Denny & Co., Perth, W. Australia
67	Denny, P.	Bellfield, Dumbarton, N.B.
784	Dewar, J. M.	
1167	Dewrance, J.	165, Great Dover Street, S.E.
1088	Dingle, A. F.	158, Kingston Rd., Portsmouth
1208	Dixon, H. G.	Board of Trade, Custom House Arcade, Liverpool
403	Dobbie, J. G.	203, West George Street, Glasgow, N.B.
1119	Dobson, Thos.	61, Park Place, Cardiff
601	Dobson, W.	13, Montague Rd., W. Croydon



NO.	NAME	ADDRESS
1322	Dodds, P.	17, Cambridge Gardens, Edinburgh, N.B.
1178	Dodds, W.	51, Guildhall St., Folkestone, Kent
240	Don, T.	35, Meeching Road, Newhaven, Sussex
250	Donbavand, C. J.	25, Ashley Rd., Crouch Hill, N.
666	Dorward, Ed.	27, Cairnie St., Arbroath, N.B.
912	Double, F. W.	112, Orford Rd., Walthamstow
1240	Doust, R.	19, Fossdene Rd., Charlton, S.E.
173	Drewry, T.	15, Hampton Road, Forest Gate, E.
1406	Dumlin, Wm.	67, Richmond Road, Cardiff
1217	Dunbar, A.	South Wharf, Melbourne, Australia
205	Duncan, R.	16, Argyle Road, Ilford, Essex
970	Duncan, W. S.	
821	Dundas, G.	21, Shakespear Avenue, Portswood, Southampton
686	Dunlop, David	Shipbuilder, Port Glasgow, N.B.
1198	Dunlop, Jno.	c/o Messrs. Worms & Co., Port Said, Egypt
907	Dunn, J.	
442	Dunnett, W.	P. & O.S.N. Co., R.A. Docks, E.
944	†Durstun, Sir A. J., K.C.B., R.N.	Admiralty, Whitehall, S.W.
676	Eames, R. H.	94, Tressillian Road, St. John's, S.E.
294	Edgar, G.	10, Clytha Crescent, Newport, Mon.
942	Edmiston, J. B.	1, Highfield Road, Walton, Liverpool
911	Edwards, W. W.	
743	Elkin, W.	Port Commissioner's Dockyard, Hourah, Calcutta

† Life Member by Election.

NO.	NAME	ADDRESS
1228	Elliot, John	90, Claude Road, Cardiff
1224	Elliot, Thos.	20, Newport Road, Cardiff
352	Elliott, D.Sc. Pf. A.C.	University College, Cardiff
940	Elliott, E.	British India Co., Mazagon Dock, Bombay
1323	Elliott, Jas.	13, Station Road, Norton, Stockton-on-Tees
536	Elliott, R.	35A, Ardgowan St., Greenock, N.B.
690	Elmslie, J. E.	113, Drakefield Road, Balham, S.W.
1073	Elwood, R. H.	32, Disraeli Road, Forest Gate, E.
650	Evans, W.	46, Mount Stuart Square, Cardiff
804	Evans, W.	
249	Fairles, G. W.	"Bank House," Alexandra Rd., Parkstone, Dorset
215	Fairley, J.	"Blair Villa," Auchamore Rd., Dunoon, N.B.
336	Farina, A. J.	63, Quayside, Newcastle-on- Tyne
858	Farquharson, A.	Core, Port Gordon, Banffshire, N.B.
400	Fawdon, H. W., R.N.R.	
998	Ferguson, C.	57, Dalhousie Street, Glasgow
936	Ferguson, J.	2A, Margery Park Rd., Forest Gate, E.
1185	Fernandes, H. J.	c/o Messrs. Gillespie Bros., 23, Crutched Friars, E.C.
309	Field, R. J.	375, Cowbridge Road, Cardiff
1279	Fielden, B.	28, Pelham Road, S. Woodford, E.
633	Findlay, T.	72, Somerset Road, Waltham- stow, E.

NO.	NAME	ADDRESS
1018	Finlayson, P.	
1147	Finlayson, W.	Colombo Iron Works, Colombo, Ceylon
50	Fish, T. W.	Lloyd's Registry, Calcutta
776	Fisher, Alex.	Post Office, Point, Natal, Africa
1188	Fitzgerald, J. C.	10A, Ardgowan St., Greenock, N.B.
422	Flannery, Sir J. F., M.P.	9, Fenchurch Street, E.C.
1230	Fleming, John	47, Mount Stuart Square, Cardiff
206	Fletcher, W. R.	Kattendyk Dock, West Quai, Antwerp
806	Forbes, H.	18, Ordnance Rd., Southampton
805	Forbes, J. H.	18, Ordnance Rd., Southampton
509	Ford, William	"Pelham House," Hainault Road, Leytonstone, E.
1007	Forrest, R. C.	
480	Fortune, W.	182, High Road, Leyton, E.
708	Foster, W. E.	
1177	Fowles, Robt.	80, Terrace Road, Plaistow, E.
751	Fox, Crosby	537, Manchester Road, Cubitt Town, E.
685	Fox, Samson	Leeds Forge, Leeds
254	Fraser, H.	Millwall Boiler Works, E.
609	Fraser, J. D.	Port Trust, Karachi, India
851	Fraser, W. G.	13, Park Road, Portswood, Southampton
1101	Froom, G. B.	12, Kendoa Road, Bedford Road, Clapham, S.W.
331	Fuller, C., R.I.M.	100, Gurney Rd., Stratford, E.
1110	Furneaux, J. B.	Victoria Works, Gateshead-on-Tyne
558	Gallon, J. W.	43, Fairland Rd., Stratford, E.
177	Gardiner, W.	58, Durham Rd., Manor Park, E.
1325	Gates, W.	"Forest View," Sharpness, Gloucester

NO.	NAME	ADDRESS
1064 850	Gatheridge, T. R. Gay, A.	43, Plantagenet St., Cardiff 26, Terminus Terrace, South- ampton
742	Gearing, E.	"Fenshurst," Clarence Drive, Harrogate
1329	George, F. T., R.N.	7, York Terrace, New Brompton, Kent
1170 39	George, R. Gibb, A.	14, Chaseley Rd., Stepney, E. "Garthland," Westcombe Park Rd., Blackheath, S.E.
549	Gibbons, C. A.	P. & O. S. N. Co., R. A. Docks, E.
218	Gibbs, A. W.	c/o Eastern Telegraph Co., Suez
193	Gibson, D.	18, Wordsworth Avenue, Cardiff
1370	Gibson-Sugars, J. S., R.N.	H.M.S. <i>Pioneer</i> , Chatham
643	Gifford, P.	2, Woodrow Circus, Pollok- shields, Glasgow, N.B.
1372	Gilbert, C. H.	Inspector-Genl. of Machinery, Chilian Navy, Valparaiso, S. America
1269 501	Gilby, J. N. Girdwood, A.	6, Pepys Rd., New Cross Gate, S.E. 39, Kilmaurs Rd., Newington, Edinburgh, N.B.
62	Girvin, J.	High St., Carrickfergus, Ireland
1104	Glassford, H.	B. I. S. N. Co., R. A. Docks, E.
1377	Glew, Benj.	Inst. Engineers & Shipbuilders, Hong Kong
965	Gold, J.	22, Granville Street, Gateshead- on-Tyne
1100	Good, F.	62, Cathedral Road, Cardiff
432	Gordon, G. H., R.N.R.	P. & O. S. N. Co., R. A. Docks, E.
1337	Graham, W. A.	"Dainskir Villa," Fort Road, Newhaven
490	Granger, G.	13, Clarendon Rd., Walthamstow
828	Grant, A.	"Bon Accord," Oxford Avenue, Southampton

NO.	NAME	ADDRESS
1284	Grant, Thos. F.	B. I. Engineers' Club, Calcutta
108	Gray, J. M.	4, Ladbroke Crescent, Notting Hill, W.
1358	Green, D. P., R.N.	H.M.S. <i>Banshee</i> , Mediterranean Station
1395	Green, E. W.	Blackwall Yard, E.
1251	Green, John	19, Thorold Road, Ilford, E.
5	Greer, D.	1, Denmark Terrace, Harvey Road, Leytonstone, E.
872	Greig, G.	c/o Messrs. Turner, Morrison & Co., Calcutta
1159	Greig, G.	15, Newcastle Street, Cubitt Town, E.
807	Griffiths, J.	39, Belmont Road, Portswood, Southampton
857	Groundwater, S.	c/o Messrs. C. Farnham & Co., Old Dock, Shanghai, China
791	Guthrie, Alex.	107, Avenue Rd., Southampton
986	Guy, W. J.	4, Old Pk. Terrace, Wednesbury, Staffordshire
980	Hale, C.W., R.N.R.	22, Woodfield Road, Redland, Bristol
253	Halkett, J. P.	Glengall Iron Works, Millwall, E.
248	Hall, J. P.	"Carville," Lawrie Rd., Sydenham, S.E.
951	Hall, J.	B. I. S. N. Co., R. A. Docks, E.
1249	Hallett, Joseph	108, Fenchurch Street, E.C.
1273	Halliday, Geo.	45, Torrington Square, W.C.
962	Hamilton, W. D., R.N.R.	116, St. Vincent Street, Glasgow, N.B.
46	Hammett, H.	3, Mansfield Rd., Ilford, Essex
499	Harbland, G. H., R.N.R.	33, Dacre Road, Plaistow, E.
1357	Hardcastle, C. V., R.N.	R.N. Engineers' Club, Portsea
914	Hardy, T.	33, Plasturton Avenue, Cardiff

NO.	NAME	ADDRESS
1205	Hare, W. B.	A. U. S. N. Co., Kangaroo Point, Brisbane, Australia
1008	Harper, C. W.	6, West High Street, Inverurie, N.B.
339	Harrap, G. F.	5, Budge Row, Cannon St., E.C.
853	Harris, A.	73, Queen Victoria Street, E.C.
488	Harris, G. A.	77, Brookbank Rd., Lewisham, S.E.
825	Harris, H. A.	
689	Harris, J. T.	"The Hall," Headcorn, Kent
180	Harris, W.	39, Albert Road, Forest Lane, Stratford, E.
337	Haslam, Sir A. S.	Breadsall Priory, Derby
668	Hawks, N. S.	"Glenairlie," Tavistock Road, South Woodford, Essex
6	Hawthorn, J. G.	41, East India Dock Road, Poplar, E.
1404	Hay, John	94, Gower Street, W.C.
1011	Hendry, J. R.	2, Rosefield Street, Dundee, N.B.
401	Hicks, G. W.	67, Grove Green Road, Leyton- stone, E.
1193	Higgins, A.	48, Osnaburgh Street, Regent's Park, N.W.
1256	Highet, Wm., R.N.R.	11, Westland Drive, Whiteinch, Glasgow, N.B.
863	Hindmarsh, M.	"The Laurels," Cavendish Grove, Southampton
898	Hislop, J.	
176	Hodgson, S.	76, Scarboro' St., W. Hartlepool
1211	Hogg, Hubert	"Davenshaw House," Congle- ton, Cheshire
228	Hollman, H. W.	92, Billiter Buildings, E.C.
675	Holt, W.	69, Bute Street, Cardiff
586	Hopkirk, W.	"Seafield," Barrhead, Glasgow, N.B.
574	Horn, W.	19, Fairland Road, Stratford, E.
1392	Hosgood, O. S.	5, Charles Place, Barry, Cardiff

NO.	NAME	ADDRESS
226	Hossack, W.	"Orton," Fochabers, Scotland, N.B.
371	Houfe, W. W.	c/o Inst. Engineers and Ship- builders, Hong Kong
1172	Hough, E. R.	66, Fenchurch Street, E.C.
975	Howell, W.	16, Argyle Road, Ilford, Essex
1379	Howie, Jas.	7, Bolton Road, Stratford, E.
84	Hudson, C.	"Woodlands," Disraeli Road, Forest Gate, E.
1338	Hudson, G. W., R.N.	R. N. Engineers' Club, Portsea, Hants
717	Hughes, W. O.	144, Anfield Road, Liverpool
1381	Hulme, D.	6, Acland Street, Limehouse, E.
1086	Hume, G.	63, Billiter Buildings, London
1181	Hunter, John	B. I. Engineers' Club, Calcutta
1013	Hurst, J.	Tilbury Docks, Essex
887	Inglis, D. J.	"Heysham Villa," Heysham Road, Southampton
1246	Inglis, John, L.L.D.	Pointhouse Shipyard, Glasgow, N.B.
993	Inglis, W.	67, Capel Road, Forest Gate, E.
1218	Ireland, J. H. H., R.N.	H.M. Royal Yacht, Portsmouth
642	Irwin, J. H.	Mowbray Terrace, Sunderland
1027	Jacks, T.	
655	Jackson, A. S.	Lloyds Bank Buildings, Cardiff
710	Jackson, F.	Victoria Foundry, East Moors Road, Cardiff
590	Jackson, N. J.	"Carsay Cottage," Tayvallysh, Lochgilphead, N.B.
1092	James, W. G.	427, New Cross Road, S.E.
748	Jarrett, W. G.	7, Alverton Street, Deptford, S.E.

NO.	NAME	ADDRESS
1037	Jeff R., R.N.R.	4, St. Margaret's Road, Plumstead, S.E.
537	Jeffrey, E.	P. & O. S. N. Co., R. A. Docks, E.
419	Jobling, J. C.	Blackwall Iron Works, Blackwall, E.
1344	Johnson, H. J.	29, Roupell Street, S.E.
730	Johnston, J. B.	1, Primrose Terrace, George Lane, South Woodford
520	Johnston, J. D.	43, Osborne Road, Truebrook, Liverpool
350	Johnstone, J.	25, Vernon Road, Plumstead, Kent
652	Jones, C.	10, Glynrhondda Street, Cardiff
333	Jones, C. J. J., R.I.M.	H.M. Indian Marine, Bombay
656	Jones, E.	Mount Stuart Dry Docks, Cardiff
1366	Jones, F. W.	120, Diana Street, Cardiff
1253	Jones, R. A.	30, Henrietta Street, Swansea
810	Jordan, W.	21, Exmoor Road, Southampton
1152	Joy, Basil H.	85, Gracechurch Street, E.C.
469	Jurd, A. E.	6, Cranbury Place, Southampton
946	Keay, R. D.	31, Wellington Road, Charlton, S.E.
900	Kellard, G.	
1350	Kelly, E. J.	1, Plasturton Place, Cardiff
706	Kelly, R.	44, Heathwood Terrace, Charlton, S.E.
583	† Kelvin, Rt. Hon. Lord	Glasgow University, c/o The Librarian
1384	Kendall, C. E.	35, Cohun Road, Cardiff
635	Kendall, W. T.	7, Manor Road, Tilbury, Essex
496	Kendrick, A.	c/o Messrs. Gibbs & Co., Cardiff
740	Kendrick, W.	Gordon Rd., West Cowes, I.W.
1234	Kennedy, R. S.	Glengall Iron Works, Millwall, E.
1320	Kenny, Alex.	48, Bell Street, Dundee, N.B.

† Life Member by Election.



NO.	NAME	ADDRESS
163	Kent, J. M.	P. & O. S. N. Co., R.A. Docks, E.
107	Kidd, G. W., Ald.	229, Romford Road, Forest Gate, E.
1276	Kidd, H.	"Craig Lea," Mansfield Street, Glebe Point, Sydney, N.S.W.
671	Kidd, J. McF.	213, Old Ford Road, Victoria Park, E.
153	King, G.	143, Breakspear Road, Brockley, S.E.
731	Kinghorn, J. W.	13, Praya Central, Hong Kong
238	Kingswood, R. W.	84, Chapel Street, Newhaven, Sussex
216	Kirkland, J.	69, Margery Park Road, Forest Gate, E.
140	Kirkwood, J., R.N.R.	P. & O. S. N. Co., R. A. Docks, E.
104	Kirkwood, R. A., R.N.R.	"Clinkeehan House," Clones, Ireland
811	Kydd, Alex.	37, Cambridge Rd., Southampton
373		
840	Lamont, W. Lane, J.	Colombo Iron Works, Colombo 12, Oxford Avenue, Southampton
275	Lang, J., R.N.R.	23, Cave Road, Plaistow, E.
947	Langdon, W.	Ditton Road, Widnes
1055	Lapsley, G. S.	57, Forest Drive, Leytonstone, E.
605	Latta, J. G.	77, Billiter Buildings, E.C.
279	Laurie, L. G.	Messrs. Laurie & Co., Newport, Mon.
1367	Law, G. H.	7, Disraeli Rd., Forest Gate, E.
1097	Law, J. N.	4, Church Terrace, Roath, Cardiff
765	Lawrie, J.	Government Marine Surveyor's Office, Singapore
1091	Lawrie, W.	89, Osborne Rd., Forest Gate, E.
824	Leather, J.	9, Northbrook Rd., Southampton
1335	Lee, D. S.	191, Gipsy Lane, Forest Gate, E.

† It is with deep regret we have to record the death of J. Kirkwood in February, 1900.

NO.	NAME	ADDRESS
385	Lee, R. E.	41, Mount Stuart Square, Cardiff
874	Lee, R. F.	2, Avondale Terrace, Chester Road, Sunderland
255	Leslie, J. L.	26, Victoria St., Arbroath, N.B.
7	Leslie, R., R.N.R.	1, Argyle Road, Ilford, Essex
542	Leslie, W.	c/o Messrs. Don Watson & Co., 5 Commercial Buildings, Calcutta
1022	L'Estrange, A.	65, Fenchurch Street, E.C.
1340	Leveson, A.	"St. Helier," Clutha Park, Newport, Mon.
933	Lindsay, A.	91, Khedive Rd., Upton Manor, E.
711	Lister, C.	35, Radnor St., Peckham, S.E.
839	Liston, A. G.	Parker's Hotel, Southampton
1248	Little, Edwin, R.N.	Fleet Engineer, H.M.S. <i>Cæsar</i> , Portsmouth
604	Livesey, G. F.	Calle Galos, No. 26, Valparaiso, S. America
1373	Livingston, D.	B. I. Engineers' Club, Bombay
412	Lochhead, D.	P. & O. S. N. Co., R. A. Docks, E.
172	Lockie, J.	2, Custom House Chambers, Leith
599	Loudon, T.	62, Park Grove, Whiteinch, Glasgow
545	Lovett, J., R.N.R.	27, Handfield Road, Waterloo, Liverpool
1036	Lowdon, D.	23, Kingsland Crescent, Barry Dock, Cardiff
48	Lowe, J. Y., R.N.R.	B. I. S. N. Co., R. A. Docks, E.
1375	Lyle, Jas.	Invicta Works, East Dulwich, S.E.
1374	Lynn, J. R. D.	11, Chatsworth St., Sunderland
243	Macartney, Jas.	Queen's Chambers, Queen's Place, Sydney, N.S.W.
881	Macdonald, A.	107, Clova Rd., Forest Gate, E.

NO.	NAME	ADDRESS
720	Macdonald, Alex.	"Garry Cottage," James St. Fens, Stanley, Perthshire
968	Macdonald, J.	Harbour Office, Hong Kong
1299	Macfarlane, J.	467, Collins St., Melbourne, Australia
1212	Mackay, Chas.	B. I. Engineers' Club, Bombay
372	Mackie, A.	36, Westdown Rd., Leyton Rd., Stratford, E.
931	Mackintosh, A. R.	43, Garden Reach, Calcutta
65	Mackintosh, E.	9, Shore Street, Inverness, N.B.
812	Mackintosh, R.	51, Bugle Street, Southampton
362	Maclachlan, J.	29, Belgrave Road, Ilford, E.
1298	Maclean, C. W.	Marine Board Office, Melbourne, Australia
1362	Madge, W.	18, Pains Road, Southsea
38	Maginnis, A. J.	Chapel Chambers, Liverpool
699	Mahany, R., R.N.R.	94, Glenpark Rd., Forest Gate, E.
213	Mair, D.	559, Barking Rd., Plaistow, E.
1280	Mannox, W.	300, Hagley Rd., Birmingham
70	Manuel, G. W., R.N.R.	"Eildon," Catford, Kent
423	Marquand, A. J.	2, Dock Chambers, Cardiff
1200	Mason, G. F.	245, Newport Road, Cardiff
500	Massey, W. H.	Twyford, R.S.O., Berks
473	Mather, A. H.	2, Kingsdown Road, Leyton- stone, E.
941	Mathias, J. R.	
1271	Matthew, J. P.	8, Crofton Road, Camberwell, S.E.
756	Matthew, W.	91, Tyndall Road, Leyton, E.
954	Maud, C. K.	Upper Edmonton, Middlesex
550	Maxton, J.	4, Ulster Street, Belfast
1112	McAdam, D.	"Marybank," March Street, Peebles, N.B.
1347	McArthur, J. D.	7, Westbank Place, Hillhead, Glasgow, N.B.
622	McCaig, R.	P. & O. S. N. Co., R. A. Docks, E.

NO.	NAME	ADDRESS
584	McClelland, Alex.	"Oakcrest," Victoria Road, Dunoon, N.B.
1077	McColl, H.	"Avondale House," Milford Haven
430	McEachran, C.	Greenock, N.B.
27	McIndewar, A.,	92, Dongola Road, Plaistow, E.
379	R.N.R.	
	McInnes, K.	27, Salisbury Rd., Forest Gate, E.
582	McIntyre, W. D.	Strathleven Place, Dumbarton, N.B.
35	McKellar, M. C.	140, Byers Road, Dowanhill, Glasgow, N.B.
390	McKenzie, C.	B. I. S. N. Co., R. A. Docks, E.
1051	McKenzie, K.	31, Ferry Road, Renfrew, N.B.
135	McKenzie, T. A.	28, Percy Rd., Upton Manor, E.
1267	McLachlan, H.	"Marine View," Helensburgh, N.B.
115	McLachlan, J.	43, Chobham Road, Leyton- stone, E.
409	McLachlan, J.	Thistle Works, Paisley, N.B.
507	McLachlan, John	8, Queen's Crescent, Cathcart, Glasgow
1150	McLaren, W.	107, Browning Road, Manor Park, E.
199	McLean, N. K.	"Endrick Villa," Cann Hall Road, E.
1378	McNaughton, D.	25, Heyes Rd., Everton, Liver- pool
141	McOnie, J.	
165	McPhail, P., R.N.R.	
1145	McPhail, R.	17, Albany Street, Leith, N.B.
1380	Meade, A. P.	202, Grange Road, Ilford, E.
118	Menzies, Alex.	Banchory, Kincardineshire, N.B.
1390	Metcalf, C. W.	5, Beatrice Street, Sunderland, B.C.C.
1225	Metcalf, H. E.	57A, Rosendale Road, Dulwich

NO.	NAME	ADDRESS
1204	Miall, H. J. R.	"Elm Hayes," Paulton, Bristol
1270	Michie, Jas.	91, Grosvenor Road, Ilford, E.
444	Miller, Alex.	2, Armadale Pl., Greenock, N.B.
1017	Mills, A. E.	"Ivy Villa," Downend Road, near Bristol
1339	Minhinnick, P. C., R.N.	H.M.S. <i>Canopus</i> , Mediterranean Station
426	Mitchell, D.	49, Milton Road, Gravesend, Kent
425	Mitchell, S.	49, Milton Rd., Gravesend, Kent
493	Mitchell, W.	61-63, Westow Road, Upper Norwood
178	Mollison, R.	57, Forest Drive, W. Leyton- stone
514	Moody, T. V.	
820	Moore, F.	c/o Messrs. Wilson & Co., Bahia
754	Moore, S. H.	9, Landseer Road, Bow, E.
1403	Mordey, T. H.	40, Plymouth Road, Penarth, Cardiff
392	Morgan, D. J.	Barry Dock, Cardiff
1296	Morgan, J. E.	4, Windsor Tee., Docks, Cardiff
530	Morgan, J. O.	H King St., Newcastle-on-Tyne
673	Morison, A.	10, Queen's Chambers, Welling- ton, New Zealand
640	Morrin, R.	69, Scaristrick New Rd., South- port
1062	Morris, G. S.	Amberley, Canterbury, New Zealand
1341	Morrison, J. D.	59, Draper Street, South Mel- bourne, Australia
978	Morrison, R.	220, White Post Lane, East Ham, E.
428	Moss, T.	19, Victoria Rd., Upton Lane, E.
1026	Muir, J.	c/o Messrs. J. King & Co., Engi- neers, Howrah, Calcutta
761	Munro, G. K.	17, Kelvinhaugh St., Glasgow
1314	Munro, W.	B. I. Engineers' Club, Calcutta

NO.	NAME	ADDRESS
1393	Munroe, R.	Penarth Slipway, Penarth, Cardiff
410	Murphy, E. O., R.N.R.	c/o Bailey & Murphy, 17, Praya, Hong Kong
241	Murray, C. W.	"Bellcorie," St. Denys Road, Portswood, Southampton
1032	Nairn, A. C.	P. & O.S.N. Co., R.A. Docks, E.
983	Napier, A.	2, Upper Chamberlayne Place, Southampton
1334	Ness, Alex.	"Dura," Bonhill Road, Dumbar- barton, N.B.
25	Newall, G. W.	19, Granville Terrace, Terrace Road, Upton Manor, E.
757	Newall, J. M.	19, Brigade Terrace, N. Wool- wich
234	Newby, C. G.	51, Deanery Rd., Stratford, E.
382	Niccol, D.	29, Brisbane Street, Greenock, N.B.
738	Nicholl, E., R.N.R.	26, Mount Stuart Sq., Cardiff
207	Nichols, F.	North Collingham, Newark, Notts.
1290	Nicholson, J. D.	11, Ryder Street, Cardiff
1245	Nicholson, Jos.	Hutton Avenue, W. Hartlepool
220	Nicoll, J.	42, Norfolk Road, Ilford, E.
80	Noble, C.	56, Selwyn Rd., Upton Manor, E.
134	Northcott, W. H.	Hatcham Iron Works, Pomeroy Street, S.E.
943	Organ, F. W.	13, Bryn Road, Swansea, Wales
920	Oswald, J.	2, Abbotsford Pl., St. Andrews
217	Page, T. H.	140, Leadenhall Street, E.C.
1277	Park, C. J., R.N.R.	6, Sandringham Terrace, Wetherby, Yorks.

NO.	NAME	ADDRESS
723	Parkin, J.	9, Cambridge Road, Blackpool
1236	Parsons, Hon. C. A.	"Holey Hall," Wylam-on-Tyne
1321	Parsons, J. R.	"Ivy Bank," Dartmouth, Devon
934	Paterson, T.	"Chingford Villa," Obelisk Road, Southampton
225	Paton, W.	P. & O. S. N. Co., R. Albert Docks
888	Peskett, F.	8, Oxford Street, Southampton
1034	Petersen, E.	
89	Phelip, Thos. R.	Portstown, Inverurie, Aberdeen
355	Phillip, E. C.	79, Disraeli Rd., Forest Gate, E.
533	Piercy, W.	21, Endymion Road, Finsbury Park, N.
621	Pinkerton, W. F.	B. I. Engineers' Club, Calcutta
889	Plowman, G. H.	"Glenburne," Atherley Road Hill, Southampton
883	Pollock, J.	22, Billiter Street, E.C.
420	Pottie, G.	42, Mansfield Road, Ilford
1084	Powel, H. C.	c/o Messrs. Willans & Robinson, Ltd., Victoria Works, Rugby
679	Power, G. S.	4, Tamar Terrace, Saltash, Cornwall
721	Pratten, W. J.	"Morningson," Derry Volgie Avenue, Belfast
1237	Preston, John	"Sturage House," Deptford
772	Primrose, W. B.	7, Belmont Street, Hillhead, Glasgow
1261	Proctor, W. E.	43, Billiter Buildings, E.C.
988	Prophet, W. W.	
69	Purves, D.	"Greenfields," Greenhill Road, Allerton, Liverpool
1292	Quinn, J. B.	6, Buddle Road, Wallsend-on-Tyne
37	Rait, H. M.	155, Fenchurch Street, E.C.
112	Ramsay, W., R.N.R.	P. & O. S. N. Co., R. A. Docks, E.

NO.	NAME	ADDRESS
753	Ramsay, W.	c/o Messrs. Butterfield & Swire, Hong Kong
363	Randall, A. E.	P. & O. S. N. Co., R. A. Docks, E.
99	Randall, J. W.	P. & O. S. N. Co., R. A. Docks, E.
782	Rankine, D. A.	11, Oriel Chambers, Water Street, Liverpool
1163	Reay, J. D.	"Clutha Villa," Barking Road, E.
596	Redman, J. Fell	155, Osborne Road, Forest Gate, E.
593	Redman, W.	"Harborough Villa," Stroud Road, Staines, Middlesex
831	Reed, E. C.	Raamsdon, Holland
707	Reed, Sir E. J., K.C.B.	Broadway Chambers, Westmin- ster
192	Reed, T. A.	Bute Docks, Cardiff
16	Reid, D.	P. & O. S. N. Co., R. A. Docks, E.
150	Reid, J.	25, Pindrell Road, Brockley, S.E.
1021	Reid, J.	P. & O. S. N. Co., R. A. Docks, E.
1006	Reid, J. S.	12, Montague St., Glasgow, N.B.
921	Reid, R.	5, "Keston Villas," S. Totten- ham
119	Reid, T. H.	62, New Road, Grays, Essex
1354	Relf, J.	"Rocklands," Albany Rd., Lea Bridge Road, Leyton, E.
539	Rennie, H.	B. I. S. N. Co., Calcutta
895	Richardson, H. T., R.N.R.	SS. <i>Empress of India</i> , Van- couver, B.C.
161	Richardson, J. W.	"Jesmond," Wallwood Road, Leytonstone, E.
576	Rickie, D.	c/o Messrs. Finlay, Muir & Co., Calcutta
495	Riddell, J.	16, Caird Drive, Hyndland Rd., Partick, Glasgow, N.B.
540	Riddle, A. C.	c/o Messrs. G. Thompson & Co., Royal Albert Dock, E.



NO.	NAME	ADDRESS
879	Risk, A.	"Abbotrule," Obelisk Road, Woolston, Southampton
815	Ritchie, J. K.	58, Bridge Road, Southampton
1399	Ritson, S. M. K.	7, Dogo Street, Cardiff
1202	Robb, Jas.	Rohilkund & Kumaon Railway Co., Barielly, India
159	Roberts, W. C.	18, Windsor Rd., Forest Gate, E.
41	Robertson, A.	55, Clova Road, Forest Gate, E.
56	Robertson, A. W.	"Glencarse," The Cliffs, South- end-on-Sea
741	Robertson, J.	4, Clova Road, Forest Gate, E.
53	Robertson, J.	11, St. Andrew's Rd., Plaistow, E.
1201	Robertson, T.	40, Eleanor Rd., Romford Rd., E.
1369	Robertson, W. L.	55, Elizabeth Rd., Upton Park, E.
575	Robertson, W. P.	16, Park Road, West Ham, E.
747	Rockcliffe, G. W.	"Sproston's Limited," George- town, Demerara, B. Guiana
846	Roskelly, W. T.	"Hayle," Ordnance Rd., South- ampton
913	Ross, D.	
653	Ross, H.	1, St. Mary Avenue, Liscard, Cheshire
1278	Ross, S. J.	Town Hall, Hackney, N.E.
235	Ross, W. M., R.N.R.	9, Hampton Rd., Forest Gate, E.
735	Rosser, W. D.	2, Windsor Esplanade, Cardiff
897	Rule, R.	11, College Rd., Mount Radford, Exeter
845	Rutherford, G.	Mercantile Pontoon Co., Cardiff
33	Ruthven, J. R.	41, Percy Road, Upton Park, E.
1257	Rutter, E. W., R.N.R.	7, Kensington Hall Gardens, W. Kensington
513	Ryder, C. L.	Walker Gate Brass Works, Newcastle-on-Tyne

NO.	NAME	ADDRESS
144	Sage, S. C.	47, Cecil Road, Plaistow
435	Sage, W. J.	"Dupree Villa," Finchley Park, N.
529	Salmond, W.	
307	Scarth, P.	38, Hawstead Rd., Catford, S.E.
45	Scobie, A.	5, Ardgowan Terr., Sandyford, Glasgow, N.B.
455	Scott, J.	"Hope Villa," Cann Hall Rd., E.
903	Scott, J., C.B.	Greenock Foundry, Greenock, N.B.
1400	Scott, J. D.	18, Stewart St., Chester Road, Sunderland
1398	Scott, John	17, Mount Stuart Sq., Cardiff
739	Scott, R.	24, Richard's Terrace, Roath, Cardiff
1258	Scott, R.	3, Rawdon Place, Cardiff
236	Scott, R. A., R.N.R.	55, Lewes Road, Newhaven, Sussex
1294	Scott, Thos.	36, Seething Lane, E.C.
737	Scott, W.	134, King's Road, Cardiff
282	Seabrook, A. W.	40, Mayfair Avenue, Ilford, E.
638	Seabury, E.	Burnt Mill, nr. Harlow, Essex
1233	Selby, H. A.	101, St. John's Rd., St. John's, S.E.
1089	Shand, H.	64, Queen's Road, Newcastle- on-Tyne
1368	Shanks, Jas.	73, Wallwood Road, Leyton- stone, E.
1328	Shapcott, R. A., R.N.	23, Victoria Road, N., Southsea
1081	Sharp, W.	30, Heaton Road, Newcastle- on-Tyne
1111	Sharp, W. E.	Supt. Engineer, Bang Kok Dock Co., Bang Kok, Siam
332	Sharvell, G. H., R.I.M.	"Longfield Court Villas," Long- field, Kent

NO.	NAME	ADDRESS
950	Shaw, A.	B. I. Engineers' Club, Calcutta
833	Shearer, G.	58, Romford Road, Stratford
492	Shearman, J.	59, Conway Road, Cardiff
1207	Shirra, James	10, Thames Street, Balmain, Sydney, N.S.W.
1227	Shorey, C. E., R.N.	H.M.S. <i>Spanker</i> , Portland.
10	Shorey, F. W.	14, Forest Drive, W. Leyton- stone, E.
1223	Shotton, J. W.	13, Clifton Place, Newport, Mon.
301	Simpson, J. W.	6, Campdale Rd., Tufnell Pk., N.
396	Simpson, W.	15, Wandsworth Road, Cardiff
97	Sinclair, J., R.N.R.	9, Rutland Place, Glasgow, N.B.
117	Sinclair, R.	10, Parsons Green Terrace, Edinburgh, N.B.
999	Sinclair, R. B	5, Elliott Street, Middlesbro'
128	Slater, C.	13, Cambridge Road, Seven Kings, Ilford, E.
338	Sloggett, G.	35, Stacey Road, Cardiff
523	Small, H. C., R.N.R.	67, Osborne Road, Forest Gate, E.
961	Smith, A. W.	Engineers, Limehouse, E.
960	Smith, D. R.	20, Prestage Street, Poplar, E.
976	Smith, J.	"Farm House," Tweedmouth, Berwick, N.B.
90	Smith, J.	37, Marques Rd., Crouch Hill, N.
303	Smith, J. T., R.N.R.	7, The Green, Stratford, E.
223	Smith, J. W., R.N.R.	240, Uxbridge Road, Shepherd's Bush, W.
98	Smith, P., R.N.R.	55, Osborne Rd., Forest Gate, E.
589	Smith, S.	59, Second Avenue, Manor Pk., E.
646	Smithson, A. E.	21, West Bute Street, Cardiff
195	Snell, R. G.	P. & O. S. N. Co., Bombay
346	Soper, T.	Deptford Pier, S.E.
1168	Soutar, C. C.	Anglesea Rd., Wivenhoe, Essex
958	Speedy, W.	56, High Street, East Ham, E.
1254	Speedyman, J.	92, Plashet Grove, Upton Pk., E.

NO.	NAME	ADDRESS
1241	Spence, J. A.	241, Romford Road, Forest Gate, E.
939	Spiers, H. J., R. N. R.	103, Embleton Road, Ladywell, Kent
440	Spiers, R.	B. I. Engineers' Club, Bombay
632	Stables, R.	2, Winchester St., Silvertown, E.
130	Stark, H.	34, Mars Terrace, Crescent Road, Plumstead, Kent
1107	Stark, J.	15, St. Vincent Place, Glasgow
233	Stark, Jas.	13, Stopford Road, Upton Manor
1154	Steel, J. F.	15, Three Mill Lane, Bromley-by-Bow, E.
817	Steele, L.	Limewood Hill Lane, Southampton
886	Stephen, D. W.	Board of Trade, Cardiff
856	Stephens, W. H., R. N. R.	"Gordon House," Poplar, E.
113	Stevenson, J.	22, Disraeli Road, Forest Gate, E.
257	Stevenson, J. B.	27, Robertson Street, Greenock, N. B.
36	Steward, Jas.	13, Otterburn Terrace, Jesmond, Newcastle-on-Tyne
44	Stewart, J.	22, Dacre Rd., Upton Manor, E.
1206	Stewart, R.	Marine Board Office, Brisbane, Australia
880	Stewart, S. T.	Milton Avenue, Southampton
467	Still, W.	77, Cecil Rd., Upton Manor, E.
693	Stockwell, A. C.	372, Stanstead Rd., Catford, Kent
1259	Strong, R. H.	2, Stuart Street, Cardiff
1295	Sturrock, W.	27, Clive Street, Grangetown, Cardiff
424	Swift, J. C.	27, Jermingham Road, New Cross, S. E.
393	Symonds, H. G.	Mount Stuart Square, Cardiff
1057	Tait, A.	495, St. Vincent Street, Glasgow, N. B.

NO.	NAME	ADDRESS
712	Tatam, F. R.	"Inglehurst," Hadley Wood, Barnet
14	Taylor, J.	B. I. Engineers' Club, Calcutta
198	Taylor, M. B., R.N.R.	19, Milton Avenue, Hornsey Lane Gdns., Highgate, N.
768	Taylor, W. A.	9, Harold Rd., Upton Park, E.
138	Taylor, W. I.	"Maybank," Belmont Rd., West Green, S. Tottenham, N.
1214	Teed, H. R., R.N.	H.M.S. <i>Mallard</i> , Chatham
397	Terry, S. H.	17, Victoria St., Westminster, S.W.
701	Thackrah, J.	41, Great Northern Road, Aberdeen, N.B.
258	Thom, J.	"Crathes," Aberdeen, N.B.
971	Thompson, P. G.	62, Wrottesley Rd., Plumstead, Kent
126	Thorburn, T., R.N.R.	P. & O.S.N. Co., R.A. Docks, E.
1078	Thorn, A. H.	10, St. Ann's St., Chepstow, Mon.
174	Thornton, R. P.	62, Teviot Street, Poplar, E.
945	Threlfall, G.	50, Fenchurch St., London, E.C.
762	Tod, J.	15, Pembroke Terrace, Cardiff
1371	Tomkins, J. A., R.N.R.	39, Bolton Rd., Stratford, E.
1243	Torrie, James	Rivington, Wellawatte, Ceylon
568	Tosh, D.	24, Albert Street, St. Pancras, N.W.
503	Tosh, W.	P.O. Box 2392, Johannesburg, S.A.R.
547	Tough, Alex.	B. I. Engineers' Club, Calcutta
1199	Towers, W.	Trinity Wharf, Blackwall, E.
594	Tricker, C. H.	78, Dacre Rd., Upton Manor, E.
1024	Troup, C. L.	282, Victoria Dock Road, E.
917	Trowell, W. J.	
1019	Tucker, A. E.	11, Westcombe Rise, Humber Road, Westcombe Park

NO.	NAME	ADDRESS
105	Turnbull, M., R.N.R.	72, Terrace Rd., Upton Manor, E.
843	Turner, H. T.	53, Bridge Road, Southampton
1161	Turner, W. H.	23, Cumberland Avenue, Sefton Park, Liverpool
789	Turner, W. J.	
380	Tyler, G. B.	42, Pigott St., Limehouse, E.
156	Tyler, J. J.	189, Malmesbury Rd., Bow, E.
1025	Vicary, W. J.	150, Hollybush St., Plaistow, E.
1308	Vile, A.	5, Denton Rd., Canton, Cardiff
1376	Vose, H. J.	8, Colville Gardens, Bayswater, W.
852	Wailes, T. W.	"Jesmond House," Richmond Road, Cardiff
554	Walker, A.	166, Crown Street, Aberdeen, N.B.
1093	Walker, A.	24, Leadenhall Street, E.C.
755	Walker, A. O.	"South Lodge," Blackwall Tunnel, S.E.
292	Walker, S. F.	Bloomfield Crescent, Bath
196	Walker, W. C.	13, Mansfield Rd., Ilford, Essex
1056	Wallace, W. C.	Atlas Steel Works, Sheffield
1266	Wallau, F. P.	"Iona," Belmont Place, Ports- wood, Southampton
1083	Walliker, J. F.	"Alston," Penarth, S. Wales
1052	Walliker, J. G.	"The Buttrills," Barry, South Wales
1109	Walters, W. H.	13, Mellor Road, Birkenhead
906	Washer, J.	R.M.S. Packet Co., Southamp- ton
1405	Watson, A. R.	61, Diana Road, Cardiff
1402	Watson, D. G.	203, Barry Road, Dulwich, S.E.
1394	Watson, G. C.	"Granville House," Bedford Park, Croydon

NO.	NAME	ADDRESS
1360	Watson, J. H., R.N.	H.M.S. <i>Terpsichore</i> , Chatham
413	Watt, J. H.	65, Durham Rd., Manor Pk., E.
504	Watt, R.	51, Darnley Street, Gravesend
49	Weir, J.	Holm Foundry, Cathcart, Glasgow
272	Wells, G.	"Elysee Villa," Sea View, Portland, Dorset
1010	Westmoreland, F.G., R.N.R.	"Southend," Catford, S.E.
1331	Wheatley, G. E., R.N.	H.M.S. <i>Star</i> , Portsmouth
54	White, F. J., R.N.R.	4, "Cypress Villa," Buckingham Rd., Woodford, Essex
143	White, W.	"Whiteinch," Forest Drive, Leytonstone, E.
672	† White, Sir W. H., K.C.B.	Director of Naval Construction, Admiralty, Whitehall, S.W.
387	Whyte, J. A.	Inverleven, Dumbarton, N.B.
1310	Whyte, J.	39, Steele Rd., Leytonstone, E.
876	Wickham, W. H.	
1219	Widdas, T. D.	56, Plasturton Avenue, Cardiff
1000	Wiles, F. S.	122, St. Mary Rd., Southampton
285	Williams, A. J.	
129	Williams, Jos.	5, "Grange Villas," High Road, Ilford, E.
841	Williams, W. H.	1, Milton Avenue, Southampton
528	Williamson, R.	Union Dry Dock Co., Newport, Mon.
577	Williamson, R., R.N.R.	591, Barking Road, E.
1138	Williamson, W. A., R.N.R.	Bell's Asbestos, Eastern Agency, 3, Battery Road, Singapore
1050	Wilson, A.	24, Norwood St., Spring, Hull
1045	Wilson, C. G.	"Bath Hotel," Cambridge
1293	Wilson, Ed. A.	"Poplin Cottage," Van Road, Caerphilly, near Cardiff
639	Wilson, H. C.	6, Trump St., Cheapside, E.C.

† Life Member by Election.

NO.	NAME	ADDRESS
996	Wilson, J.	11, Norse Road, Scotstown, near Glasgow, N.B.
899	Wilson, J.	53, Albert Road, Gourock, N.B.
1315	Wilson, P. C.	B. I. Engineers' Club, Bombay
125	Wilson, W. W.	P. & O. S. N. Co., Bombay
169	Wiltshire, G.	8, St. Andrew's Rd., Plaistow, E.
1365	Wimshurst, H. C.	7, Crescent Grove, Clapham Common, S.W.
157	Winterburn, W. G.	c/o Messrs. G. Fenwick & Co., Hong Kong, China
726	Wood, Alex.	41, Ranelagh Road, Leyton- stone, E.
608	Wotherspoon, J.	"Rosebank," Forest Hill, S.E.
188	Young, J., R.N.R.	P. & O. S. N. Co., R. A. Docks
924	Young, J. D.	2A, Tower Chambers, Old Church Yard, Liverpool
1226	Younger, A. Scott	8, Walmer Crescent, Glasgow, N.B.





## ASSOCIATE MEMBERS.

NO.	NAME	ADDRESS
1120	Appelbee, N.	Town Hall, Cardiff
902	Atkinson, R. C.	16, Globe Road, Southampton
1190	Axworthy, F.	7, Central Park Rd., East Ham, E.
1317	Baskett, A. Scott	Dowlaishueram, Godavary Dist. Madras
465	Beckett, F.	21, Carholm Road, Lincoln
1364	Billinton, P.	56, South Rd., Newhaven, Sussex
836	Campbell, A.	9, St. John's St., Southampton
718	Croft, W.	P. & O. S. N. Co., R. A. Docks, E.
830	Cutler, G.	4, St. Mary's Rd., Southampton
1291	Davies, J.	185, Macintosh Place, Cardiff
607	Deans, A. R.	P. & O. S. N. Co., R. A. Docks, E.
896	Denny, J.	c/o Messrs. Russell, Denny & Co., Ltd., Fremantle, West Australia
973	Dingle, F. C.	"St. Helier," Upper Stafford Road, Southampton
445	Dow, J.	5, Franklin Terr., Dumbarton Rd., Glasgow, N.B.
26	Ellis, T. H.	165, Great Dover Street, S.E.
1355	Fraser, M.	37, Cowbridge Road, Cardiff

NO.	NAME	ADDRESS
437	Gale, W.	12, Donnington Sq., Newbury, Bucks
451	Girdwood, J. F.	89, Coniston Road, Edinburgh, N.B.
1069	Gover, F. C.	Hayes Place, Hayes, Kent
1238	Hutchins, E. E.	26, Plasturton Gardens, Cardiff
795	Kenny, C.	32, Brinton's Rd., Southampton
466	Lilly, W. E.	Trinity College, Dublin
868	Lindsay, D.	46, Northbrook Rd., Southamp- ton
1215	McAuslan, W.	Engineers' Institute, Shanghai
598	McKenzie, A.	Haila Kandi, Cachar, Assam, India
471	McKersie, J.	12, Upper Frank St., Belfast
613	Menzies, T. E.	20A, Highbury Grove, N.
1053	Milner, A. R.	"Beaconsfield House," Matlock Bank, Derbyshire
788	Milvain, H. G.	36, Selwyn Road, Plaistow, E.
793	Mooney, S. V.	
1262	Odagiri, E., I.J.N.	3, Albion Street, Hillhead, Glasgow, N.B.
891	Parry, A. E.	"Bushwood," Portswood Lawn, Southampton
450	Patterson, W. W.	Oldlands Common, near Bristol
705	Pratt, A.	49, Richmond Road, Ilford, E.
867	Price, E. C.	"The Laurels," Cavendish Grove, Southampton

NO.	NAME	ADDRESS
1356 764	Reid, W. Robertson, A. M.	95, Grange Gardens, Cardiff 55, Clova Road, Forest Gate, E.
459	Sage, S. C. W.	13, The Drive, Cranbrook Road, Ilford, E.
935	Scott, J.	3, Milton Road, Southampton
1345	Seed, T. J.	11, The Grove, Blackheath, S.E.
890	Shapter, F.	
448	Shiedeaux, J.	28, Stafford Rd., Forest Gate, E.
414	Stalker, A. C.	"Leonard Villa," Credon Road, Plaistow, E.
200	Stevenson, A. L.	23, Benledi Street, Poplar, E.
1082	Stewart, H. A.	135, Sultan Road, Portsmouth
794	Stockley, H. C.	
664	Taylor, Ed. J.	Government Mills, Tangier, Morocco, N. Africa
1164	Taylor, F. G.	35, Hilton Street, Kittybrewster, Aberdeen
1275	Thomson, Alex.	34, Terrace Rd., Upton Manor, E.
452	Trenow, H. C.	35, Ashburton Rd., Addiscombe, Croydon, Surrey
680	Turner, S.	Chaseley, Rochdale
866	Willey, D. H.	8, Gloucester Sq., Southampton
438	Wymer, D. W.	"Dumfin," Stanhope Road, Sidcup, Kent

## ASSOCIATES.

NO.	NAME	ADDRESS
477	Alder, J. F.	P. & O. S. N. Co., R. A. Docks, E.
1094	Anderson, P. A.	3, Warriston Crescent, Edinburgh
1152	Barnes, C. W.	"The Vicarage," Grove Road, Bow, E.
795	Battle, A. E.	"Kenelwater," Oakfield Road, Ilford, E.
1016	Beale, James E.	5, Marine Terrace, Sheerness
727	Bond, H. T.	32, Wakefield St., East Ham, E.
1327	Broadbent, D. R.	26, Great Russell St., Russell Square, W.C.
774	Brownie, J.	P. & O. S. N. Co., R. A. Docks, E.
926	Bull, P. A.	29, Vernon Road, Old Ford, E.
1103	Cantounias, C.	B. I. S. N. Co., R. A. Docks, E.
987	Cleghorn, T. B.	3, Tidal Basin Road, Victoria Docks, E.
969	Collingridge, W. E.	"Kenmore," Shepherd's Hill, Highgate, N.
1349	Condell, M. A.	26, Ethnard Road, Old Kent Road, S.E.
1336	Day, W.	1, Chandos Road, Stratford, E.
551	Donald, W. C.	
555	Farenden, W. E.	P. & O. S. N. Co., R. A. Docks, E.
561	Finnecey, P.	P. & O. S. N. Co., R. A. Docks, E.
1002	Foulds, J.	6, Antigua St., Greenock, N.B.
937	Fraser, W. J.	193, Harold Rd., Upton Pk., E.

NO.	NAME	ADDRESS
773	Frater, T. S.	14, Dupree Road, Charlton, S.E.
458	Gale, J.	P. & O. S. N. Co., R. A. Docks, E.
1252	Godfrey, H.	28, Randolph Road, Custom House, E.
691	Graham, F.	P. & O. S. N. Co., R. A. Docks, E.
695	Haynes, F. G.	"Orton Rectory," Rotherham, Yorks
1165	Hodgart, A.	17, Albion Terrace, Gravesend
684	Hogg, Stanley	29, Dunmow Road S., Stratford, E.
1283	Howell, W.	315, Victoria Dock Road, E.
1175	Hughes, A.	315, Victoria Dock Road, E.
1255	Hutton, G.	
1232	Jenkin, Leonard	20, Deanery Road, Romford Road, E.
1047	Kendall, H.	P. & O. S. N. Co., R. A. Docks, E.
694	Kight, C. W.	111, Evering Road, Stoke Newington, N.
1179	Lovatt, H.	8, John Street, Gateshead-on-Tyne
1058	Macdonald, J. A.	3, Quadrant, N. Berwick, N.B.
957	Madge, G. H.	B. I. Engineers' Club, Calcutta
566	Malcolm, M.	"Brooklyn," Humber Road, Westcombe Park, S.E.
787	Martin, J. C.	34, Waterloo Rd., New Brompton, Kent
1305	Morrison, J. J.	

NO.	NAME	ADDRESS
1030	Nicoll, W.	"Skelmervie," Luthrie, Cupar, Fife
457 1407	Parsons, R. Pull, E.	P. & O.S.N. Co., R.A. Docks, E. 60, Oxford Road, New North Road, N.
1046	Reynolds, W. H.	Charnwood Terrace, Chichester Park, Belfast, Ireland
1063	Robertson, W. C.	"Torone Cottage," Torry, N.B.
1146	Rogers, J. S.	11, Piercefield Place, Cardiff
1009	Rollo, W.	41, Elgin Ter., Partick, Glasgow
616	Rooke, P. P.	11, Allhallows Street, Bideford, Devon
1346	Rose, A. E.	21, Fossdene Road, Charlton, S.E.
1067 597	Seabrook, J. A. Sheppard, E.	98, Fisher St., Barking, Essex 2, Victoria Terrace, Florence Road, Bromley, Kent
855	Simpson, W. B.	c/o Messrs. Jardine, Matheson & Co., Hong Kong
981	Smith, E. C., R.N.	Sunny Vale, Gravesend
1048	Smith, W. K.	7, Clune Brae, Port Glasgow, N.B.
1268	Stephens, W. J.	57, Alcester St., Stoke, Devonport
462	Stokes, C. R.	100, Drakefell Road, Brockley, S.E.
1012	Stuart, A. R.	196, Hainault Road, Leytonstone, E.
938	Stump, W. L.	42, Stavordale Road, Highbury, N.
1319	Sutherland, D.	1B, Summerside Place, Leith

NO.	NAME	ADDRESS
1311	Sutherland, Jas.	P.& O.S.N. Co., R.A. Docks, E.
1352	Taylor, L.	B. I. Engineers' Club, Calcutta 11, Stopford Rd., Upton Manor, E.
885	Terveen, J. H.	
1122	Thomson, J. A.	
1031	Wass, W. E.	"Orchard House," Melrose, N.B.
1137	Wishart, Thos.	234, Crown St., Glasgow, N.B.



## GRADUATES.

NO.	NAME	ADDRESS
922	Adamson, E. J.	Salisbury Terrace, Prince Consort Rd., Gateshead-on-Tyne
918	Arcus, J. W.	2, Plimsoll Street, Poplar, E.
1004	Armstrong, C. H.	472, Barking Road, Plaistow, E.
967	Beamish, R. L.	Parrock Street, Gravesend, Kent
1316	Berger, C. C.	42, Clever Rd., Custom House, E.
1302	Bromley, E. W.	3, Suffolk Place, Sevenoaks, Kent
1209	Browning, G. A.	25, Claremont Road, Forest Gate, E.
1068	Browning, W. E.	25, Claremont Road, Forest Gate, E.
1194	Coleman, H. A.	5, Chauntler Road, Custom House, E.
760	Craig, A.	53, Earlham Grove, Forest Gate, E.
1003	Cropley, W. W.	52, Knox Road, Forest Gate, E.
1158	Dancaster, E. J.	162, East India Road, Poplar, E.
483	Duckham, W.	29, St. George's Square, Forest Gate, E.
1182	Ferguson, A.	9, Warren Road, Leyton, E.
1125	Gilmour, R.	48, Capel Rd., Forest Gate, E.
1123	Groombridge, E. G.	38, Sunny Vale Terrace, Loampit Hill, Lewisham



NO.	NAME	ADDRESS
1140	Kinley, E. F.	47, Crescent Road, Upton Manor, E.
758	Lawson, A.	76, Disraeli Road, Forest Gate, E.
1080	Lintott, G. E.	179, Balaam Street, Plaistow, E.
1191	McLean, T. M.	2, Radnor Terrace, 314, Dumbar- barton Road, Glasgow
617	Morison, D. H. L.	James Street, Stornoway, N.B.
657	Owen, H.	
1156	Pluck, R.	254, Green St., Upton Park, E.
728	Roberts, C.	53, Amity Road, West Ham, E.
1155	Robertson, B. B.	4, Clova Road, Forest Gate, E.
744	Robertson, J.	
745	Robertson, J. G.	
1144	Robertson, J. T.	4, Clova Road, Forest Gate, E.
1149	Roy, Lindsay	53, Groombridge Rd., Victoria Docks, E.
994	Sellex, J. E.	
1065	Smith, T. W.	"Lynton," Tottenham Lane, Hornsey, N.
1288	Speedyman, A. W.	92, Plashet Grove, Upton Park, E.
1176	Stewart, J., jun.	22, Dacre Rd., Upton Manor, E.
1361	Sturrock, John	106, Selsdon Road, Upton Park, E.
932	Sumner, J.	4, Crosby Rd., Romford Rd., E.

NO.	NAME	ADDRESS
1239	Thompson, R. J.	133, Gertrude Terrace, Downsell Road, Stratford, E.
1184	Watson, C.	38, Sebert Rd., Forest Gate, E.
1005	York, E. A.	12, Elm Road, Forest Gate, E.



## COMPANIONS.

NO.	NAME	ADDRESS
405	Angove, W., Capt.	122, Leadenhall Street, E.C.
185	Aukland, T. F.	80, Bishopsgate Street Within
1324	Bailey, J. S.	18, Billiter Street, E.C.
1186	Ballantyne, R.	38, Langham Rd., West Green, N.
87	Beldam, R.	"The Limes," Hounslow
*844	Blackmore, E., Capt.	63, Gloucester Place, Portman Square, W.
1274	Bowden, E.	Bute Docks, Cardiff
1287	Brown, A.	422, Barking Rd., Plaistow, E.
1306	Calder, T. C.	c/o Newport Engineering Co., Ltd., Newport, Mon.
353	Colsell, F.	2, New London Street, E.C.
247	Crompton, R. E.	4, Queen Victoria Street, E.C.
1260	Diamond, W. H.	77, Deburgh Street, Cardiff
151	Dick, W. B.	King and Queen Wharf, 254, Rotherhithe St., S.E.
835	Dixon, J.	Dock Supt., L. & S.W. Ry. Co., Southampton
1401	Dobbins, E.	3, Kyveilog Street, Cathedral Road, Cardiff
28	Domoney, J. W.	"Montrose," Balham Park Rd., S.W.
1351	Dove, E. J.	5, St. Nicholas Buildings, New- castle-on-Tyne

\* It is with great regret we have to record the death of Captain Blackmore.


NO.	NAME	ADDRESS
1242	Duncan, J. T.	Oaklands, Llandaff
1333	Etheridge, C. K.	"Brookfield," Dalebay Road, Upper Tooting
1396	Fergusson, A. M.	17, Mount Stuart Sq., Cardiff
626	Fish, F.	281, Whitechapel Road, E.
570	Fisher, J. A.	Secretary United Asbestos Co., Billiter Street, E.C.
1318	Frazer, J. S.	Britannia Buildings, Cardiff
1363	Gracie, Jas.	Gracechurch Street, E.C.
51	Green, J. L.	London Zinc Mills, Wenlock Road, N.
1304	Grisdale, J.	1, Claughton Rd., Plaistow, E.
1173	Hall, W. L.	"Tranmire," Tennyson Road, Small Heath, Birmingham
1385	Handcock, E., jun.	Shipowner, Cardiff
1389	Hardcastle, J. H.	29, Minian Road, Cardiff
927	Harrison, F. A., Capt.	66, Mark Lane, E.C.
569	Hay, G.	"The Chestnuts," Broadway, Stratford, E.
109	Hay, J. W.	River Don Works, Sheffield
1397	Hill, H. J.	211, Newport Road, Cardiff
786	Hill, T. R.	The Bow Foundry, Bow, E.
357	Hodgkinson, Comr., R.N.	23, Great Winchester St., E.C.
316	Hughes, H.	59, Fenchurch Street, E.C.
354	Hurndall, W. F.	18, Billiter Street, E.C.
406	Hutchinson, W. E., Capt., R.N.R.	61, Poets Road, Canonbury, N.

NO.	NAME	ADDRESS
1226	Jones, J.	Bute Dry Docks, Cardiff
317	Keenan, M.	Armagh Works, Tredegar Road, Bow, E.
1029*	Lambert, H., Capt.	"Cathay," Newhaven, Sussex 11, London Street, E.C.
103	Lester, H. E.	
1359	Martin, W. T.	103, Bute Docks, Cardiff
696	McGlasson, R.	39, Dagnall Park, Selhurst, S.E.
1265	McNair, C. C.	16, Westbourne Road, Penarth, Cardiff
1221	Murrell, F. H., Capt.	34, Mount Stuart Square, Cardiff
297	Neal, W. G.	3, Amen Corner, Paternoster Row, E.C.
106	Newton, J.	79, Mark Lane, E.C.
1391	Niven, Thos.	205, Newport Road, Cardiff
102	Perkins, T. W.	11, London Street, E.C.
1309	Petri, C.	42, Mount Stuart Sqr., Cardiff
956	Plater, H., Capt.	18, Campbell Road, Bow, E.
110	Reid, W.	112, Fenchurch Street, E.C.
1229	Rosser, T. N.	9, Bute Esplanade, Cardiff
1409	Sallaway, A. E.	236, Portway, West Ham, E.
1297	Sanderson, R. O.	8, N.W. Exchange, Cardiff
1383	Smith, C.	Dyfric Street, Cathedral Road, Cardiff
1382	Smith, R. K.	James Street, Cardiff

\* It is with deep regret we have to record the death of Captain H. Lambert in March, 1900.

NO.	NAME	ADDRESS
910	Spence, J.	60, Clive Road, Canton, Cardiff
1250	Tom, Hy., Capt.	187, Castle Road, Cardiff
1210	Tomioka, S., Capt.	
892	Wait, A. M., Capt.	Marine Supt., Union SS. Co., Southampton
247	Walker, J.	"The Hermitage," Bushwood, Leytonstone, E.
894	Wilding, H.	Manager, American Line, Canute Road, Southampton
1388	Williams, A. S.	108, Fenchurch Street, E.C.
1387	Williams, Owen	37, Mount Stuart Sqr., Cardiff
1386	Williams, W.	37, Mount Stuart Sqr., Cardiff
923	Willock, F. G.	109, Hope Street, Glasgow, N.B.
376	Wimshurst, J.	7, Crescent Grove, Clapham Common






## In Memoriam.

SESSION 1896—97.

- Archie Black (MEMBER), died at Antwerp.
- Archie Campbell (COMPANION), died at Highgate.
- Captain Chapman (COMPANION), died at Southampton.
- Lewis W. Coubro (MEMBER), died in Australia.
- Ivie Douglas (MEMBER), died at Forest Gate, E.
- Thos. Henderson (MEMBER), died at Liverpool.
- J. C. Howieson (MEMBER), died at Kirkcaldy.
- G. John (MEMBER), died at Cardiff.
- J. Milne (MEMBER), died in Queensland.
- J. Stephen (MEMBER), died at Singapore.
- J. Steven (MEMBER), died in India.
- A. Watson (MEMBER), died at Manor Park.
- J. J. Graham (MEMBER), killed by accident at Bombay.
- A. Inglis (MEMBER), drowned by accident at Shanghai.





## In Memoriam.

SESSION 1897—8.

**A. W. Anderson** (MEMBER), died at Forest Gate, E.

**J. C. Barr** (MEMBER), died at Southampton.

**P. H. Black** (MEMBER), died at Greenock.

**D. J. Brand** (MEMBER), died at Townsville.

**H. Jves** (MEMBER), died at Poplar, London, E.

**A. D. Paterson** (MEMBER), died at Walthamstow.

**G. Price** (MEMBER), died at Cardiff.

**J. C. Raven** (MEMBER), died at Cardiff.

**John Stewart** (MEMBER), died at Brighton.

**Archd. Thomson** (MEMBER), died at Stoke Newington.



**J. H. Thomson** (MEMBER), died at Custom House,  
London, E.

**J. Thomson** (COMPANION), died at Upton Manor, E.

“Stat sua cuique dies ; breve et irreparabile tempus  
Omnibus est vitæ ; sed famam extendere factis,  
Hoc virtutis opus.”

**C. J. Chisholm**, lost in the *Aden*, off Socotra.

“Aqua involvens navemque virosque.”





## In Memoriam.

SESSION 1898—99.

**H. P. Conway** (MEMBER).

**Chos. Duff** (MEMBER), died September, 1898.

**Hugh Eaglesome** (MEMBER), drowned March, 1898.

**W. Elliot** (MEMBER), died April, 1898.

**John Ferguson** (MEMBER), died October, 1898.

**David Henderson** (MEMBER), died August, 1898.

**J. H. Hawks** (MEMBER), drowned December, 1898.

**A. McMillan** (MEMBER), died April, 1898.

**D. Meikleroid** (MEMBER), died March, 1898.

**C. C. Mitchell**, drowned May, 1898.


**F. W. Mollett** (MEMBER), died October, 1898.

**G. H. Morgan** (MEMBER), died January, 1899.

**F. W. Nisbett** (MEMBER), died March, 1898.

**F. W. Wymer** (MEMBER), died November, 1898.





## In Memoriam.

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SESSION 1899—1900.

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**D. Brown** (MEMBER), died October, 1899.

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**C. S. Du Sautoy** (PRESIDENT S. CENTRE), died  
October, 1899.

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**Geo. Inglis** (MEMBER), died May, 1899.

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**J. Phillips** (MEMBER), died February, 1899.

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**J. W. Sellex** (MEMBER), died March, 1899.

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**W. Smith** (MEMBER), died March, 1899.

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**W. H. Taylor** (MEMBER), died March, 1899.

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**C. C. Young** (MEMBER), died January, 1900.

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**G. W. Oswald** (GRADUATE), died May, 1899.

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“Stat sua cuique dies; breve et irreparabile tempus  
Omnibus est vitæ; sed famam extendere factis,  
Hoc virtutis opus.”







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INSTITUTE OF MARINE ENGINEERS  
INCORPORATED.

SESSION



1899-1900.

President : SIR JAMES LYLE MACKAY, K.C.I.E.

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Volume XI.

EIGHTY-THIRD PAPER

(OF TRANSACTIONS)

A Comparison between the  
Performances of Two Steamships

BY

**Mr. J. D. McARTHUR**

(MEMBER).

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READ AT

THE INSTITUTE PREMISES, 58, ROMFORD ROAD, STRATFORD.

ON MONDAY, 8th MAY, 1899.



## P R E F A C E .

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58, ROMFORD ROAD,

STRATFORD,

12th June, 1899.

A Meeting of the Institute of Marine Engineers was held here this evening, presided over by Mr A. BOYLE (Chairman of Council), when a Paper by Mr. J. D. McARTHUR (Member), on "A Comparison between the Performances of Two Steamships," read at a former meeting, held on Monday, 8th May, was discussed.

It was resolved to adjourn the further discussion of the subject till the re-opening of the session on the second Monday of September (11th), and in the meantime print and issue the Paper, to give Members at a distance an opportunity of sending contributions to the discussion. In accordance with this arrangement the Paper is now issued.

JAS. ADAMSON,

*Hon. Secretary.*

