

SESSION



1893-94.

R E P O R T

OF

T H E P R O C E E D I N G S

AT THE

A N N U A L M E E T I N G

H E L D A T

58, ROMFORD ROAD, STRATFORD,

O N

F R I D A Y , M A R C H 1 6 T H , 1 8 9 4 .

INSTITUTE OF MARINE ENGINEERS
INCORPORATED.

Session,



1893-4.

ANNUAL MEETING

On Friday, March 16th, 1894,

AT

58, ROMFORD ROAD, STRATFORD.

PROGRAMME.

Part I.

Approximate Time.

- 7.0 Opening Remarks—
The Chairman, MR. F. W. WYMER.
- 7.15 Appointment of Scrutineers—
Proposer, MR. J. M. GRAY
Secunder, MR. JOHN ADAMSON.
- 7.30 Annual Report—
THE HONORARY SECRETARY.
- 7.40 Financial Report—
THE HONORARY TREASURER.
- 7.50 The Bristol Channel Centre—
THE HONORARY LOCAL SECRETARY.
- 8.0 The Southampton Centre—
THE HONORARY LOCAL SECRETARY.
- 8.10 Local Centres—
MR. J. R. RUTHVEN.
- 8.15 ADJOURNMENT AND INTERVAL.
- 8.40 Adoption of Reports—
Proposer, THE CHAIRMAN.
Secunder, MR. A. W. ANDERSON.

Part II.

Approximate Time.

- 8.50 Declaration of the Result from the
Voting Papers by the Scrutineers—
MESSRS. T. K. SMITH & A. ROBERTSON
- 9.0 Vote of Thanks to the President,
(W. H. WHITE, Esq, C.B., LL.D.)—
Proposer, MR. G. W. MANUEL.
Secunder, MR. J. LOCKIE.
- 9.15 Vote of Thanks to Office-Bearers
and Council, 1893-4.
Proposer, MR. T. F. AUKLAND.
Secunder, MR. J. Y. LOWE.
Responder, MR. J. H. THOMSON (Chair-
man of Council).
- 9.30 Vote of Thanks to the Auditors,
MESSRS. J. BLAKE & J. G. MARTIN—
Proposer, MR. S. C. SAGE.
Secunder, MR. J. NICOLL.
- 9.38 Appointment of Auditors for 1894-5
Proposer, MR. R. ELLIOT.
Secunder, MR. D. GREER.
- 9.45 General Remarks—
MR. F. W. WYMER.

Motion for adjournment to consider
and discuss certain recommendations.

Proposer, MR. A. W. ROBERTSON.
Secunder, MR. R. LESLIE.

Vote of Thanks to the Chairman of the Evening—

Proposer, MR. S. W. NEWALL.

Secunder, MR. F. W. SHOREY.


INSTITUTE OF MARINE ENGINEERS

INCORPORATED.

SESSION



1893-4.

President: W. H. WHITE, Esq., C.B., LL.D. 

PROCEEDINGS
AT THE
ANNUAL BUSINESS MEETING,
HELD AT
58, ROMFORD ROAD, STRATFORD,
ON
FRIDAY, MARCH 16th, 1894.

CHAIRMAN

MR. F. W. WYMER (*Vice-President*).

The CHAIRMAN: Gentlemen, I have been asked to preside over your meeting this evening, and I do so with great pleasure. I have also been asked to make some remarks; but, having regard to the amount of business before us, I think the greatest kindness I can show you is not to inflict any remarks upon you, but ask you to proceed with the business. It is rather a long programme, and I shall be very glad to make a few remarks, if the opportunity should present itself.

Mr. McFARLANE GRAY: I beg to propose that Mr. A. Robertson and Mr. T. K. Smith be appointed scrutineers.

Mr. JOHN ADAMSON seconded the motion, which was at once agreed to.

The HONORARY SECRETARY (Mr. James Adamson) was then called upon to read the Fifth Annual Report, which was as follows:—

FIFTH ANNUAL REPORT.

Many of the Annual Reports presented to show the results of last year's business transactions have been far from acceptable to the constituencies interested, and it is therefore a matter for congratulation and thankfulness, that the records of the session under, the presidency of W. H. White, Esq., show the Institute of Marine Engineers to be still growing in practical usefulness and increasing in prosperity.

While we may say with the Bard, "Here's to the year that's awa'" and linger on the pleasant associations of the past, forgetting those that are otherwise or remembering only the lessons they teach us, it becomes us to be pressing forward to higher attainments and loftier ambitions, bearing in mind that not to go forward is to recede.

The MEMBERSHIP ROLL at the close of the financial year reached a total of 731:—

	Jan. 1894.	Jan. 1893.
MEMBERS	575	522
ASSOCIATE MEMBERS ..	53	53
ASSOCIATES	44	37
GRADUATES	17	6
HONORARY MEMBERS..	42	40
	<hr/>	<hr/>
*TOTAL	731	658

*Exclusive of the Southampton Centre, for which see report presented by the Honorary Local Secretary.

Our Obituary is large, and includes several who were well known, and whose names on the list are noted with keen regret:—

J. HARDY (Member), who died in May, 1893, was connected specially with our Bristol Channel Centre.

R. F. LUCOCK (Member), who was lost in the s.s. "Naronic," in February, 1893, of which steamer he was Second Engineer.

J. WILLIAMS (Member), who died in June, 1893. He joined the P. & O. Co.'s service in 1882, and for a short time prior to his death was Chief Engineer of the s.s. "Rome." He died at Rothesay, N.B.

S. CARRICK (Member), who died in June, 1893, was Superintending Engineer for the Shaw, Savill and Albion Steamship Co., and was widely known and esteemed by a large circle of friends, who appreciated the high qualities of his nature.

G. W. OUGH (Member), who died in July, 1893, was in the service of the P. & O. Co. for 11 years, and just previous to his death was Second Engineer of the s.s. "Ancona." He died in the hospital (Bombay.)

H. PRIOR (Vice-President), who died in July, 1893, joined the P. & O. Co.'s service in 1858, but at the time of his death was retired. He was one of the earliest members and supporters of the Institute.

A. STENHOUSE (Member), who died in July, 1893, at Port Said, was Second Engineer of the s.s. "Caldy" at the time of his death, while on a voyage to Hamburg.

D. McCULLUM (Member), who died in August, 1893, was Chief Engineer of the s.s. "Rohilla." He was in the service of the P. & O. Co. for about 22 years, having joined in 1871.

JOHN TAIT (Vice-President), who died in February, 1894, was in the service of the British India Co. for over 30 years, and till shortly before his death was Chief Engineer of the s.s. "India." He was the first member of the original committee to place a sovereign on the table to cover preliminary expenses in connection with the formation of the Institute, in November, 1888, and took a warm interest in its progress and advancement.

J. FERGUSON (Member), who died in February, 1894, was well known and esteemed for his kindness and his efforts to oblige all those he came in contact with, frequently inconveniencing himself to do so.

In addition to the losses we have sustained by the hand of death, we have to record six resignations received from members at home and abroad. There are also several members from whom no intimation has been received for a considerable time, and whose papers and intimations have been returned through the Post Office, probably owing to removals and notifications of change of address not having been received.

During the session seven Papers have been read and discussed. The Papers and Discussions have been, or are being, published. A list of the subjects, with the dates of the meetings at which the papers were read and discussed, is given for the information of members.

Besides the ordinary published papers, lectures have been given, specially for the younger sections of the membership, the dates and titles of these are given. There is ample scope for extension in the direction of such lectures and essays being made a special feature of, and possibly during the next session this extension may be enclosed in the ordinary course of the work.

A Drawing Class has been conducted during the winter and spring, and towards the close of the session the attendance and interest have been very satisfactory.

These classes meet on Tuesdays and Thursdays. A Prize, contributed by Mr. R. Leslie, will be awarded to the pupil who has made the best progress during the Session, as an encouragement to the class.

The Reading Room and Library have been made good use of during the session. The Reading Room Tables have been well provided by the same kind friend to whom we were indebted for contributions last session.* The Library has been added to by several volumes which have been contributed by members and friends.

Several additions have been made to the property, all of which have been duly acknowledged and credited in the books.

The attention of members is specially directed to the following points as meriting more than passing attention. Notices and cuttings of interesting cases in connection with steam ships, reported in the Press, and worthy of special comment, should be forwarded, when observed, for the scrap book. Papers which are published without the resulting discussion are open for discussion and comment by members unable to attend the meetings. Remarks by correspondence are welcomed for publication. The establishment of Centres where the papers can be read and discussed in various ports. Notice of any change of address should be given, to ensure papers and notices being directed correctly to date. All subscriptions are due on the 1st of January of each year as arranged at last Annual Meeting.

The third annual dinner was held in the Holborn Restaurant on Wednesday, June 7th, and was attended by a large number of members and friends, and guests. The report of the proceedings, including the President's address, has already been published.

The visit of the President and Mrs. White to view the premises of the Institute was paid on Saturday

* Mr. J. A. Fisher (*Honorary Member.*)

afternoon, September 9th. On this occasion a garden party was arranged for, at which the Office bearers and Members of Council met the distinguished visitors after the inspection of the premises. The arrangements for the Garden Party were entrusted to the convener of the Recreation Committee (Mr. A. W. Robertson.)

The Fifth Annual Conversazione, was held in the Town Hall, Stratford, on Friday, December the 8th, and was largely attended, the result being no less successful than on the previous occasions. The presence of W. H. White, Esq., (President) and Mrs. White added greatly to the pleasure and success of the evening. A detailed report of the proceedings is appended.

The Bristol Channel Centre has been advancing and progressing as will be seen from the report presented by Mr. George Sloggett, the Honorary Local Secretary.

The Bombay Members have been moving towards the Establishment of a Centre, several papers having been read and discussed under the Presidency of Mr. W. W. Wilson (Vice-President).

*The Southampton Members have been gathering strength, and towards the close of the session, arrangements were in hand for the formation of a Centre, which has since become an accomplished fact. The membership at the time of writing this report being over 60. The office bearers are as follows:—

Local President : C. S. DU SAUTOY, Esq., R.N.R.

Vice-President : MR. C. A. DAY.

Hon. Local Treasurer : MR. J. R. COWELL.

Hon. Local Secretary : MR. J. GRIFFITHS.

Members of Committee :

MR. ALEX. BROWN.	|	MR. C. W. MURRAY.
MR. R. MACKINTOSH.	|	MR. L. STEELE, R.N.
MR. R. COOMBER.		

*See Special Report from Southampton Local Honorary Secretary.

Messrs. W. Feast & Co., Chartered Accountants, have been engaged in auditing the books for the last two years, and during the past year have placed the whole system of book-keeping on a basis which was recommended by them to, and accepted by, the council. Having, in accordance with this, written up the books for the first quarter of the session themselves, to show the system in practical work, the books have been audited quarterly to facilitate the yearly audit now completed. It is proposed that the services of Accountants should be continued in the same way next session, at a fee of £10 10s., and that the auditors should be appointed from the membership as usual.

Messrs. J. Blake and J. G. Martin, have, in addition to the Chartered Accountants, examined and audited the books for the session just closed, as will be seen from the balance sheet submitted.

The question of additional accommodation has been brought before the Council from time to time, particularly towards the close of the session. The Drawing Class is somewhat hampered for want of room, and some arrangement will require to be made for next session to meet the growing requirements of this class.

The accommodation for meetings, where papers are read and discussed, also demands consideration and action. It has also been urged that a Billiard Room should be provided of a suitable size, and with proper accommodation for the present table, which was provided by Mr. Shorey, on the understanding that the cost should be defrayed by those using it. This cost has not yet been met, and it has been considered that, with better accommodation for players, the table would soon be cleared and become the property of the Institute. Specifications and Tracings have been issued, and tenders invited with a view to the cost being estimated to provide the necessary accommodation.

During the session a Memorial was presented to

the Board of Trade, embodying the result of discussions on subjects introduced in a paper presented to the Institute by Mr. S. C. Sage. The Memorial was favourably received, and thereafter circulated by the Board of Trade, for the purpose of obtaining the opinions of those specially interested in the points involved. The subject formed the basis of a paper read by Mr. J. R. Fothergill, before the North East Coast Institution of Engineers and Shipbuilders, at Newcastle, recently, when the resolutions submitted in the Memorial, of which the following is a copy, were supported by the Author of the paper.

14th September, 1893.

TO THE ASSISTANT SECRETARY,
BOARD OF TRADE,
MARINE DEPARTMENT.

SIR,

In the name of the Council of the Institute of Marine Engineers, I beg to bring before you the enclosed copy of a resolution, which was remitted to the Council for approval, in order that the result might be brought to your notice, with a view to the subject matter being presented for the consideration of the Board of Trade, in the most approved form.

In considering the terms of the resolution, at a recent meeting, the office bearers and Council of the Institute have had in view all the interests involved, and deemed it wiser to lay the resolution, as remitted from the meeting of February 6th, before the Board, without any alteration or amplification, but, at the same time, setting forth the points which were dwelt upon when the resolution was considered at the recent meeting referred to, when the Council had the matter under consideration.

The following points were deemed worthy of special observation:—

(1.) The resolution was passed at a meeting of the Institute, held in the ordinary course of business, to read

and discuss a paper, contributed by Mr. S. C. Sage, on the education and training of marine engineers. The title and scope of the paper was such as to evoke a good deal of interest, and the discussion extended over four evenings, the dates being Mondays, January 23rd and 30th, and Mondays, February 6th and 13th.

(2.) The intention conveyed, or desired to be conveyed, by the resolution, is, that the Engineers who join, or hope to join, the Mercantile Marine, should be as efficient as possible, and, with this in view, it is considered that an experience extending over five years *at least*, is necessary to meet the requirements.

(3.) The object to be obtained by the insistence of the five years apprenticeship is the assurance that the standard of efficiency shall be kept up and maintained.

(4.) The desire at the back of these expressions is for the maintenance of the highest efficiency in the engine-room staff of our steamers, believing that only thus can we expect to cope with our increasing responsibility, and addition to the duties devolving upon the Engineers of our Mercantile Marine, as well as the Engineers of Her Majesty's ships.

(5.) In the interests of those who have shares in steamships, or who are steamship owners, it becomes the duty of an Institute such as ours to point out that the conviction is very strong among the members that while three years may have been a long enough *minimum* apprenticeship when the present Board of Trade Rules were framed, for exceptional lads to obtain experience in the handling of tools, and education in the theory of their business, the time has more than come when it is both expedient and necessary to amend the regulations in the direction sought by the resolution.

(6.) Especially should it be looked upon as expedient and necessary that the standard of efficiency

should be maintained by all reasonable regulations, from the facts that :—

- a. Greater and increasing responsibilities rest upon the engineers of to-day, as compared with those of the past.
- b. Foreign competition is greater and increasing, and it rests largely with the most intelligent use of material in the engine department to gain the advantage in the competition.
- c. There is less hand and more machine tool labour in our workshops now than formerly, and, therefore all the more reason for an extended apprenticeship.
- d. In our large steamers there are many young engineers, who sail for years in a capacity junior to fourth engineer, and who have thus no opportunity of passing for second engineer but who might have granted them an opportunity of obtaining a third-grade certificate, as a means of encouragement.

I have the honour to be

Yours faithfully,

JAS. ADAMSON,

Honorary Secretary.

RESOLUTION REFERRED TO

“That, in the opinion of this meeting, it is highly necessary to amend the present regulations as to the second-class certificate for engineers, with regard to service in the workshop, where the *minimum* service should be five years, and that the attention of the Board of Trade should also be called to the desirability of creating a third-grade certificate, which should be

granted to those who have served at least five years in an engineering workshop, and one year at sea, and who pass the prescribed examination."

The above resolution was passed at a meeting of the Institute of Marine Engineers, held in the premises of the Institute, on Monday, February 6th, 1893.

JAS. ADAMSON,

Chairman.

I have also to report that there is another matter which partakes somewhat of a controversial nature, but it was considered advisable by the Council that it should be left out of the Report, and, if considered necessary, a dispassionate statement could be made in the course of the evening by an impartial member, in the event of any question being asked regarding the subject of difference. This refers to a series of recommendations which were submitted to the Council for adoption in the course of the past year, and which have not met with unanimous approval.



MEETINGS HELD

DATE.	NO. OF PAPER.	SUBJECT.
1893. February 6	43	Education of Engineers (Discussion)... ..
Do. 13	„	Do. do. (do.)... ..
Do. 17	—	A Century's Progress in Ship-Building
March 10	—	Annual Meeting
Do. 13	44	Boiler Furnaces
Do. 27	„	Discussion do.
April 10	45	Sizing of Marine Engines
Do. 24	„	Discussion do.
May 8	46	Lubrication of Marine Engines... ..
June 7	—	Third Annual Dinner
September 9	—	Visit of W. H. White, C.B., LL.D. (President) to the Institute Premises
Do. 11	47	The Testing of Boilers
Do. 25	„	Discussion do.
October 16	„	Do. do.
Do. 23	„	Do. do.
November 13	48	The Status of Engineers of the Mercantile Marine
Do. 27	„	Discussion do. do.
December 4	„	Do. do. do.
Do. 8	—	Conversazione
Do. 11	49	Screw Propellers, Reversible Screw Propellers, and Non-Reversible Engines
Do. 18	„	Discussion do. do.
1894. January 8	50	Pump Valves
Do. 22	„	Discussion do.

DURING 1893-4.

AUTHOR.	CHAIRMAN.	WHERE READ.
MR. S. C. SAGE ... (Member of Council)	The Honorary Secretary	Institute Premises
” ”	Do. do. ...	Do. do.
MR. JNO. ADAMSON, JUNR. (of Rothessay)	The Mayor of West Ham Alderman Kidd (Vice-President)	Town Hall, Stratford
—————	Mr. A. Thomson ... (Vice-President)	Institute Premises
MR. A. CHAPMAN (Member)	Mr. J. H. Thomson ... (Chairman of Council)	Do. do.
” ”	Mr. John Tait ... (Vice-President)	Do. do.
PROF. A. C. ELLIOTT, D.Sc. (Vice-President)	Mr. J. A. Rowe ... (Vice-President)	Do. do.
” ”	Mr. R. Leslie ... (Hon. Treasurer)	Do. do.
MR. W. M. ROSS ... (Member)	Mr. F. W. Shorey ... (Member of Council)	Do. do.
THE PRESIDENT'S ADDRESS	W. H. White, Esq., C.B., (President) [LL.D.]	Holborn Restaurant
Mr. A. W. Robertson ... (Convener Recreation Committee)	—————	Institute Premises
MR. J. F. LIVESEY ... (Member)	W. H. White, Esq., C.B., (President) [LL.D.]	Gresham College
” ”	Mr. F. W. Wymer ... (Vice-President)	Institute Premises
” ”	Mr. F. W. Shorey ... (Member of Council)	Do. do.
” ”	Do. do. ...	Do. do.
MR. T. W. FISH ... (Vice-President)	Mr. R. Leslie ... (Hon. Treasurer)	Do. do.
” ”	Mr. G. W. Manuel ... (Past President)	Do. do.
” ”	Mr. T. F. Aukland ... (Hon. Member)	Do. do.
MR. A. W. ROBERTSON ... (Convener)	W. H. White, Esq., C.B., (President) [LL.D.]	Town Hall, Stratford
MR. R. MCGLOSSON ... (Hon. Member)	Mr. F. W. Shorey ... (Member of Council)	Institute Premises
” ”	Mr. J. H. Thomson ... (Member of Council)	Do. do.
MR. W. E. LILLY ... (Associate Member)	Mr. J. R. Ruthven ... (Member of Council)	Do. do.
” ”	Do. do. ...	Do. do.

LECTURES.

(Specially for the Junior Sections)

 2ND OCTOBER, 1893.

MR. S. W. NEWALL (MEMBER).

The utilisation of the waste products of combustion for heating the jackets and casings of Marine Engine Cylinders, and the interposing of tubular hot air heaters between the cylinders and pipes as a means of increasing or maintaining the effective energy of the steam during its transit between the Boilers and Condenser.

 16TH OCTOBER, 1893.

MR. S. W. NEWALL (MEMBER).

The uses and employment of India rubber on board ship as a means of reducing the propeller and shaft vibration, and for reducing the shock between motors and their foundations.

 6TH NOVEMBER, 1893.

MR. S. W. NEWALL (MEMBER).

The adaptation of Hydraulics to thrust bearings and means of transmitting the work done by the propeller to the ship through a film of oil or water under pressure, also the lightening of the reciprocating parts of the main engine by the uses of aluminium and alloys of steel and other metals.

 20TH NOVEMBER, 1893.

THE HONORARY SECRETARY.

Essay on External Perception, with a brief outline of the principles at work in guiding us to a knowledge of the world around us.

Mr. MCFARLANE GRAY: In the course of your remarks, Mr. Adamson, you spoke of a "very heavy obituary." Ten members died during the year, and ten out of 700 means, that if ten die every year, it will take seventy years for all the members to die. I beg to say that ten is a small percentage.

Mr. JAMES ADAMSON: I only say that "our obituary is large," not "very large." It seems large to me, personally, when I remember who they are we have lost. However, I should be pleased to alter the expression and omit the large, if objectionable. I regret the fact cannot be so altered.

Mr. G. W. MANUEL: I may say that out of the ten engineers, whose deaths are recorded in this report, there are four who belonged to the P. & O. Company. Altogether there are about 100 engineers in the P. & O. Company's service who are connected with this Institute, and four out of 100 is a large percentage.

Mr. GRAY: But many of your engineers are very old men.

Mr. MANUEL: Some of them are. I can only add that I am sure we all regret the loss of these men. I cannot say more of one than another. They have all been able men, and by their death we have lost good engineers.

The CHAIRMAN: I think in referring to this matter we should bear in mind the age of the members. They are mostly up in years—40 and 50—which makes the death rate much higher than if you took it upon the whole population of the country. You have heard the report, and I think the Honorary Secretary deserves great credit for it. I have now to call on the Honorary Treasurer to present his financial report.

The HONORARY TREASURER (Mr. R. Leslie): Mr. Chairman and Gentlemen, I have much pleasure in bringing forward my report. It is not quite so bright as we could wish, but still I think it will stand the test as a favourable report.

PREMISES FUND.

Total Donations Received.

	£	s.	d.
Mr. John Tait*	1	0	0
„ Peter Denny, L.L.D.*	50	0	0
„ Walter Brock*	25	3	0
Alderman G. W. Kidd*	10	10	0
Mr. L. P. Coubro (Messrs. Lester & Perkins)*	10	0	0
Messrs. Durham, Churchill & Co.*	20	0	0
Mr. M. Keenan*	10	10	0
„ Jas. Weir*	10	0	0
„ J. H. Thomson*	10	0	0
„ A. Beldam*	25	0	0
„ C. L. E. Melsom*	5	0	0
„ C. Harris*	5	0	0
„ E. W. Manuel*	20	0	0
„ D. Phillips*	10	10	0
„ C. G. Newby*	1	0	0
Messrs. Williams, Torry and Feild	3	3	0
„ Hull, Blyth & Co.*	2	2	0
Mr. W. Boaz*	10	0	0
„ D. J. Brand (Townsville)*	5	0	0
Messrs. Dewrance & Co.*	5	5	0
Mr. Peter Denny, L.L.D.†	250	0	0
Messrs. Bremner & Co.*	25	0	0
Mr. John Lockie*	10	0	0
„ J. G. Lowe*	2	2	0
„ W. B. Dick*	30	0	0
Messrs. The London Zinc Mills*	10	10	0
„ Dewrance & Co. (additional)*	5	5	0
„ Bremner & Co. (additional)*	25	0	0
Mr. A. Laurie, Glasgow*	0	14	0
Messrs. The Union Steamship Company*	10	10	0
„ Vickers & Co., per Mr. J. W. Hay*	20	0	0
Mr. A. W. Robertson*	25	0	0
„ C. E. Hudson*	2	2	0
„ A. Robertson*	1	1	0

* Credited in Report—See Session 1891-2.

† Foundation for Gold Medal.

PREMISES FUND—*Continued.*

	£	s.	d.
Mr. J. G. Hawthorn*	5	0	0
„ A. Beldam*	2	2	0
„ A. Laurie	2	0	0
Messrs. The Darlington Forge Co.* ..	25	0	0
Mr. J. A. Rowe*	1	1	0
„ J. M'Lachlan*	0	19	0
Captain Hodgkinson*	2	0	0
Mr. J. Adamson*	5	0	0
Messrs. Rait & Gardner*	25	0	0
Mr. J. Stephens*	5	0	0
„ J. Phillips*	2	2	0
„ W. J. Craig*	2	2	0
„ J. Belloch*	2	2	0
„ T. Duff*	1	1	1
„ W. W. Wilson*	5	0	0
„ M. Turnbull*	2	0	0
Messrs. The United Asbestos Co.* ..	12	12	0
Mr. J. A. Fisher	2	2	0
„ S. H. Terry*	1	1	0
„ J. Shanks*	0	10	0
„ S. Carrick*	5	5	0
The Right Hon. Lord Kelvin	50	0	0
Messrs. J. B. Westray & Co.	25	0	0
Mr. G. Hay	10	10	0
„ D. Gillespie	0	9	0
Messrs. Caird & Co.	125	0	0
Mr. J. B. Stevenson	1	1	0
„ D. J. Brand	5	5	0
„ E. O. Murphy	2	2	0
„ J. J. Graham	5	0	0
„ J. R. Cowell	1	0	0
„ R. Adam	2	2	0
Sir J. Brown & Co.	50	0	0
Mr. S. C. Sage	2	2	0
„ G. Inglis	5	0	0
„ A. Beldam	10	0	0
Capt. Hodgkinson.. .. .	2	0	0
W. H. White, C.B.	10	10	0
R. Beldham	10	10	0

PREMISES FUND—*Continued.*

					£	s.	d.
W. Birkett..	..	..	..	..	2	2	0
A. McClelland	..	..	..	..	0	7	9
„ R. Beldam	..	..	..	..	10	10	0
Captain Hodgkinson	..	..	..	..	2	0	0
Mr. Beldam	..	..	..	..	10	0	0
„ W. Birkett	..	..	..	..	2	2	0
„ A. McClelland	..	..	..	..	0	7	9
„ W. H. White..	..	..	..	..	10	10	0
„ A. C. Campbell	..	..	..	..	5	5	0

DONATIONS—LIBRARY FUND.

					£	s.	d.
Mr. J. Lovett	..	..	..	..	1	1	0
„ W. Leslie	..	..	..	..	1	0	0
„ E. Bowen	..	..	..	..	1	1	0
„ D. McCullum..	..	..	..	..	0	10	0
„ G. Erskine	..	..	..	..	0	8	0
„ J. Thackrah	..	..	..	..	0	8	5
„ G. S. Power	..	..	..	..	0	12	6
„ P. Searth	..	..	..	..	0	10	0

The HONORARY TREASURER (Mr. Robert Leslie) (having read the items, included in the two accounts), continued: I think, considering the change in the arrangements for paying the annual subscriptions, and the fact that a great many members are in arrear, the balance sheet looks very favourable. I cannot say exactly how much money is outstanding in subscriptions, but it is from £150 to £200. That, of course, is lessening every day. Within the last day or two I have received over £4 of arrears, and I hope that when members come to Stratford and think of the Institute they will also think of their subscriptions due or over due. If they will only call in here, they can soon learn how they stand in the Institute books. It is now an easy matter for any member to know how he stands. I hope that members will do their best in respect to their payments, for the extension of our premises is very much required. This was spoken of last year, by Mr. Tait, whose name now appears in the obituary, I am sorry to say, and I think we ought to keep on speaking about it until it is carried out. This room has been so crowded at times, on the occasion of the reading or discussion of papers, that members have been sitting in the passage outside. Mr. Newall's drawing class is growing so much that I cannot invite any more of our youngsters to attend it, because there is no more room for them. To encourage them I have offered a sovereign as a prize for the best draughtsman among them, and I hope the youngest will take it. We want to throw as much spirit into the Institute as possible, so that members may have the best accommodation obtainable, each in his own sphere. Let those members who want to play billiards have a proper place to play in, and let those who want to read have a place where they can read in comfort and not be disturbed.

Mr. LOCKIE referred to the manner in which the totals of "Entrance Fees" and "Subscriptions" were carried out in the revenue account, and pointed out that the amounts might be made more clear and distinct.

Mr. C. G. NEWBY explained that the total subscriptions received during the year amounted to £541 14s. 11d., but of this sum the revenue of the year was credited with only £434 14s. 11d. The difference between £541 14s. 11d. and £434 14s. 11d. was £107, which was the amount of the subscriptions received in advance, and this £107 was included among the liabilities in the balance sheet.

Mr. SHOREY asked if anything had been allowed for depreciation on the premises of the Institute, and, if so, where it was shown in the accounts.

Mr. LESLIE replied that the premises still stood in the books at the amount which they cost, namely £1,050, and it was for the Council to determine what, if anything, should be written off for depreciation.

Mr. SHOREY: The accounts appear to show that our expenditure has exceeded our income by £21 5s. 1½d., a result which members will consider very undesirable, but we are really not that amount short, and for this reason. During the last year we have made an alteration in the arrangements for the payment of subscriptions which certainly accounts for some part of the apparent deficiency. A fee of £17 17s. that has been paid for certain plans in connection with the proposed alterations. The paid secretary has had £75, £25 of that was for last year and £50 for this year. Mr. Newall has also had an amount voted, which includes something for last year. The expenditure is therefore not so bad as it appears, and members not being acquainted with these things might take the impression that we had been rather extravagant. But with this explanation I think you will see that it is not so.

Mr. W. J. CRAIG considered the form in which the accounts had been made somewhat unsatisfactory, and said the old and new methods had been combined in such a way as to render the real condition of their finances obscure to the members. He especially com-

plained of the difficulty of comparing the items in the present accounts with those in the accounts for previous years, and instanced one item in respect of which the present accounts appeared to show a saving, whereas the actual fact was, he said, the exact contrary. With regard to the item "Denny Gold Medal Fund," he thought the word "Fund" was not a very happy one. The amount of £271 13s. against this item was not a fund set apart on a deposit receipt and earning interest. It was part of the cash in the bank on which they were working.

MR. LESLIE: This money was put in the building by the Council. Instead of borrowing £250 for the purchase of these premises, they took this £250 and pay interest on it out of the general account to the credit of the Medal Fund.

MR. CRAIG: Yes, that is so, but it is not at all clear. Then there is another matter. In last year's account the "Liabilities" included an item "To Loan Account £168 13s. 4d." I cannot find that item anywhere in this year's account. If it has been paid off this year we ought to find it shown in these accounts. It has disappeared, but where? I dare say it is all right when it is understood, but it is not clear.

MR. LESLIE: It was a Loan which has been paid off.

MR. McFARLANE GRAY: I think that Mr. Craig is a good friend to the Institute in having raised this question in the way he has done, and I leave it to him to see that our accounts are rendered so that engineers can understand them. We do not understand this account, and I do not think the members will understand it. It ought to be put in a different way. If this is the way in which Accountants make out our accounts, I do not think much of the manner in which they do their work. More details should be given to show the costs of the items.

Mr. SHOREY: I think that Mr. Gray is under a misapprehension. It is not usual to put down all the items of work in a balance sheet. The books are open to the inspection of any member throughout the year. All the various items are down in the books, and members can see them if they wish. If we have every detail shown in the balance sheet we should require a cart to carry the paper home.

Mr. MELSOM: I think that Mr. Shorey's remarks apply to a private firm where the books can be seen at any time, but in the case of an Institute like this the books are not open—they are not handy. Some of our members are abroad, and I think everything should be shown on the sheet.

Mr. GRAY: I propose that the balance sheet be made out in such a form that a plain man can understand it.

The CHAIRMAN: That is, a detailed balance sheet.

Mr. GRAY: Not only details, but so that a plain man can understand it.

Mr. SAGE: I propose that Mr. Gray shall define "what a plain man can understand."

Mr. GRAY: Put it in another way—so that "he who runs may read."

Mr. MELSOM: I second that.

Mr. JOHNSTON: I move, as an amendment, that this balance sheet be adopted, but with the addition that, in future, there shall be further details.

Mr. SHOREY seconded the amendment.

The CHAIRMAN: I must say I think this account should be altered. I consider myself a little bit acquainted with figures; but, looking at the manner in

which these figures are put, I must say it is very misleading. I think that our members in India would be perfectly bamboozled by it, and they would say "what is the Council doing to send us such an account." For our own credit, as business men, it should be corrected.

The motion and amendment were then put to the vote, and the Chairman declared the motion carried.

Mr. LOCKIE: Before leaving this matter, I would suggest that a standard plan of drawing up the balance sheet should be adopted, so that a comparison may be made between one year and another.

The CHAIRMAN: I think that may safely be left in the hands of the Council after what has passed at this meeting.

The Chairman then read the following communication:—

ST. GEORGE'S HOUSE,
638, EASTCHEAP,
LONDON, E.C.
23rd February, 1894.

To the Council,

INSTITUTE OF MARINE ENGINEERS.

Gentlemen,

We beg to hand certified Balance Sheet at 31st January, 1894, and Revenue Account for the Session 1893-4, showing an excess of expenditure over receipts of £21 5s. 1½d.

The excess is due partly to the falling off in payment of the members' subscriptions, many being in arrear from various causes. Also to the alteration of rule making annual subscriptions due on January 1st, in lieu of the anniversary of joining. There are also certain fees and grants included in the 1893-4 expenditure belonging to the Session 1892-3, which at the time

of last audit had not been voted by the Council. Provision also has been made in the present account for a Contingent Liability, in connection with the building and additions to Institute. These items, together, far exceed the amount of the deficiency, and, but for them, the expenditure would have been well within the lessened receipts.

We are pleased to state the books, opened by us in March last, have been well and properly kept under the system suggested by us in previous reports, and we have satisfaction in recording that the objection made by us to the money unbanked no longer exists.

We call attention to the liability of subscriptions paid in advance for Session 1894-5. In the early days of the Institute, when its success was uncertain and the dates for payment of subscriptions were varied, it would have been both intricate and expensive to ascertain the exact amount paid in advance. Now that the Institute is on surer footing, and a fixed date has been arranged when subscriptions should be paid (facilitating the calculation) we make the division. This liability will, however, be taken into income in the current session.

The arrears of subscriptions have never been taken into credit, and there are many outstanding.

We are, Gentlemen,

Yours faithfully,

(Signed) WALTER W. FEAST & Co.

The HONORARY SECRETARY (Mr. James Adamson) :
I think at this stage it will be interesting to read another letter that has just come into my hands. It is as follows :

TOWN HALL,

WEST HAM, E.

16th March, 1894.

SIR,

I am directed by the Council to inform you that their Technical Instruction Committee has under consideration the question of the accommodation to be provided for the various subjects to be taught in the Technical Institute, which it is proposed to erect in the Romford Road, and in order that the Committee may go fully into the matter, with a view to making the scheme as comprehensive as possible, I have been directed to state that they will esteem it a favour if you will give them the benefit of any suggestions which occur to you as being likely to tend to the successful achievement of the Council's desire to have a thoroughly good and useful Institute.

I am sending a similar letter to a number of the leading manufacturers of the district and other gentlemen, and any suggestion which you think well to make will be carefully considered by the Committee before any scheme is adopted.

I am, Sir,

Your obedient Servant,

FRED. E. HILLEARY.

J. ADAMSON, Esq.,

Sec. Institute of Marine Engineers,
58, Romford Road,
Stratford, E.

MR. ADAMSON: I think it is a very auspicious and a very happy circumstance that such a letter should have come to hand in the very midst of our meeting. The best suggestion, I think, we can offer is in the

direction of proposing to erect a commodious building wherein the Institute of Marine Engineers may be able to obtain accommodation and further the interests of technical instruction conjointly with the Committee.

The CHAIRMAN :—The next item on the Programme is the Report on the Bristol Channel Centre, which, in the absence of the Honorary Local Secretary, Mr. George Sloggett, I will call upon Mr. Adamson to give :—

INSTITUTE OF MARINE ENGINEERS INCORPORATED.

BRISTOL CHANNEL CENTRE.

ANNUAL REPORT.

SESSION, 1893-4.

In taking a retrospect of the events of the Session, 1893-4, the members of the Bristol Channel Centre may fairly congratulate themselves on the extent and variety of the ground that has been covered.

The Meetings have been held throughout at intervals of about two weeks, and with a few exceptions the average attendance has been maintained.

Two Smoking Concerts, a *Conversazione*, and a visit of the members to the Severn Tunnel Works have also contributed somewhat towards the general benefit of the Centre, besides affording opportunities for bringing the members into closer contact with each other.

INSTITUTE OF MARINE ENGINEERS.

BRISTOL CHANNEL CENTRE.

MEETINGS HELD DURING SESSION 1893—4.

DATE.	SUBJECT.	AUTHOR.	CHAIRMAN.	PLACE OF MEETING.
1893. March 8	“ Boiler Furnaces ” and Presenta- tion to the President	Presented by Dr. Elliott	Mr. D. Gibson ..	Technical School, Uni- versity College
,, 22	“ Errors of Experts ” (Discussion) ...	Mr. Jos. Williams	Professor Elliot...	University College.
April 15	Smoking Concert		do. ...	Royal Hotel.
May 3	“ Sizing of Marine Engines ”	Professor Elliot...	Mr. D. Gibson ...	University College.
,, 17	Discussion on ditto	do. ...	do. ...	do. do.
July 12	Conversazione	(Visit of Institute	Naval Architects)	The Park Hall, Cardiff.
Sept. 23	Visit to Severn Tunnel Works ...			
October 5	“ Testing of Boilers ”	Mr. J. Livesey ...	Professor Elliot...	University College.
,, 26	Discussion on ditto	do. ...	do. ...	do. do.
November 9	“ Slide Valve Practice in the Marine Engine ”	Mr. E. Jones ...	do. ...	do. do.
,, 23	Discussion on ditto	do. ...	do. ...	do. do.
December 7	“ Screw Propellers ”	Mr. R. McGlasson	do. ...	do. do.
1894. January 18	“ Pump Valves ”	Mr. W. E. Lilly...	do. ...	do. do.
,, 27	Smoking Concert		do. ...	Royal Hotel.

As regards numbers, a loss has been sustained by the removal of several members to other districts, but notwithstanding this the muster roll is steadily increasing.

It is with much regret that the death of Mr. Joseph Hardy, B.C.C. member, has to be recorded.

The Session was opened by the reading of a paper on "Boiler Furnaces," and, at the same meeting, a Testimonial in the form of an oaken bookcase was presented to Professor A. C. Elliott, D.Sc., President of the Bristol Channel Centre, by the local members, in honour of his marriage, which had recently taken place, and also as a token of appreciation of the valuable services he had rendered to the Institute.

On the 15th April, 1893, a very successful Smoking Concert was held at the Royal Hotel, Cardiff, there being a large number of persons present, and a good programme gone through. During the evening Sir Edward J. Reed, M.P., addressed the gathering.

In view of the approaching visit to Cardiff of the members of the Institution of Naval Architects, committee meetings were held for the purpose of considering what part the Bristol Channel Centre should take in their reception. It was finally decided to entertain them on one evening during their stay at a conversazione. A sub-committee, consisting of the following members, was appointed to make the necessary arrangements:—

CONVERSAZIONE SUB-COMMITTEE.

Mr. M. W. Aisbitt.	Mr. A. S. Jackson.
Mr. Hy. Cambridge.	Mr. E. John.
Mr. R. Davison.	Mr. John McCallum.
Mr. W. H. Eastwood.	Mr. J. C. S. Pease.
Professor A. C. Elliott	Mr. T. A. Reed.
(<i>President</i>).	Mr. Chas. L. Ryder
Mr. R. J. Field.	(<i>Honorary Treasurer</i>).
Mr. Jas. Ferrier.	Mr. W. Simpson.
Mr. David Gibson	Mr. George Sloggett
(<i>Vice-President</i>).	(<i>Honorary Secretary</i>).
Mr. F. Good.	Mr. Joseph Williams.
Mr. Sydney F. Walker.	

Mr. Sydney F. Walker was also appointed Convener of the Exhibits Committee, and to him is due almost wholly the credit of procuring and arranging the numerous objects on view on this occasion.

The date of the conversazione was finally fixed for the 12th of July, 1893, by arrangement with the members of the Cardiff Chamber of Commerce and the Cardiff General Reception Committee. The larger Park Hall was engaged, and every preparation made to render the reception of the Naval Architects worthy of themselves and the Institute of Marine Engineers.

THE CONVERSAZIONE.

On the evening of the 12th July, 1893, the Park Hall wore an unusually attractive appearance. The decorations were most profuse, the balconies and windows being draped throughout, and the walls adorned with hangings of every description from end to end. Plants and shrubs were distributed wherever possible throughout the hall, and also around the orchestra and front of the grand organ. Ample chairs and settees were artistically placed in the body of the hall, whilst on either side under the balconies were ranged stalls of various and interesting exhibits. The entrance to the hall was lined with men of the Cardiff Fire Brigade in uniform (by kind permission of the Mayor of Cardiff).

The guests commenced to arrive about 8.30 p.m., and were received by the President of the Bristol Channel Centre (Professor Arch. C. Elliott, D.Sc.) and the Committee.

The hall quickly became filled, and the scene then presented was a remarkably bright and picturesque one. The presence of the ladies, whose good taste, by the way, in choice of dress was exceptionally unique on this occasion, added not a little to the gaiety and general attractiveness of the evening.

The roofed promenade overlooking the stream and ground outside the hall was carpeted out, lighted and furnished with seats, and formed an excellent retreat from the warmer atmosphere of the hall itself, or for those gentlemen who desired to indulge in smoking.

The number of persons present including the members of the Institute of Marine Engineers, of the Institute of Naval Architects and friends, was upwards of one thousand.

Several of the London members were present, including Mr. W. H. White, C.B. (President), Mr. Jas. Adamson (Honorary Secretary), who was also accompanied by Mrs. Adamson, Mr. MacFarlane Gray, Mr. Churchill and others.

Amongst the guests were also the following:—Lord Brassey, Sir E. J. Reed, Sir Nathaniel Barnaby, Sir Edward Harland, Sir Jas. Ramsden, Sir Raylton Dixon, the Mayor of Cardiff, Mr. Martell, Admiral Boys and others.

The band of the Glamorgan Artillery Volunteers (by kind permission of the officer commanding), rendered excellent selections of music at intervals, whilst Mr. M. Gee officiated at the grand organ with considerable effect. Songs were also given by Madame Rees, and Mr. F. Proud. A clever and original humorous sketch, entitled "The Last of the Dragons," with lime-light illustrations, was contributed by Mr. S. W. Allen.

The following description of the exhibits is an extract from the published catalogue.

Instruments.—In this section are shown various scientific instruments, and apparatus used in the engineering and physical laboratories of the South Wales University College.

Allen's Steam Striker (Inventor, Mr. S. W. Allen, member).—This is a useful machine tool designed to

take an intermediate place between the ordinary blacksmith's hand sledge, the anvil, and the steam hammer.

The apparatus comprises an anvil, hammer, and steam cylinder in one; the ingenious arrangement of the whole being devised to place the tool in a small compass, and to make it handy and quick working.

Mills' Detaching Hook for Ships' Boats.—The advantages claimed for this invention are: The extreme simplicity of the apparatus. That there are no pins or other gear to hang at the critical moment. That it is impossible for either bow or stern to be dropped alone. A working model is shown, the boat being lowered into a tank of water and let go.

Mr. John Rogers (Local Agent for Messrs. Mills) also exhibits a model of Anderson's Patent Folding Stock Anchor, which combines the holding properties of Trotman's, and with the advantages of stockless anchors.

Log Ship Sea Anchor (Inventor, Mr. George Sloggett, Hon. Local Secretary).—This is designed to act as a locker door, so as not to take up any room, and to be always ready for use when required. Its object, when in use, is to save the time and trouble of preparing a sea anchor from spars, sails, &c., when a boat is required to ride out a heavy sea. It may also be used as a trailing anchor for beaching the boat in a surf. The principle of the apparatus is the same as that of the old ship's log, viz., a sector of a circle is formed of pieces of wood, with the grains crossed. The arc of the sector is weighted, and there is a tripping line by means of which the log can be thrown on its flat to be hauled in. When in use, as a sea anchor, the log stands upright in the water, the centre upwards, owing to the weighting of the arc, and, when done with, it is capsized and drawn back to the boat by means of the tripping line.

Lewis and Hunter's Patent Coaling System.—These models are exhibited by the Bute Docks Company, and show the arrangement and working of a set of coaling cranes in actual use at the Roath Dock, Cardiff. They are the combined inventions of Sir W. T. Lewis and Mr. Chas. L. Hunter, of the Bute Docks Company. With this system as many as four cranes have been employed simultaneously loading the same vessel, as the cranes can be brought into such positions as to plumb the steamer's hatchways. The average speed of loading is fully 250 tons per hour per crane; 293 tons of coal have actually been shipped in an hour by one crane. There is scarcely any perceptible difference in the appearance of the coal in the vessel and when it came from the collieries, after being put in by these cranes, which is a great advantage, and particularly with friable coal.

Metallic Lubricating Oil Syphon (Maker, D. B. McCallum, member).—It is claimed for this improved form of Syphon that it takes the place of the old Worsted Syphon, than which it is more reliable and regular in its action, the amount and time of drops being regulated by the number of wires in the tube. It works on shipboard as well as on land, is cheap and clean.

Cumming's Shaft Leveller (Maker, D. B. McCallum, member).—This apparatus has been specially designed for levelling shafting on board steam vessels, but will be found valuable in putting up mill gearing and lines of shafting on shore as well.

The fairness of the crank shaft is tested and adjusted to the planed faces of the bed plate or turned faces of the cylinder, and when this is found to be correct one instrument is fixed at the forward end of shaft, and another at or near the after end of crank shaft, and the difference of water levels noted. Assuming that the shaft tested shows a difference in the water level of half an inch in 10ft. length, it

follows that to be true the tunnel shafting should have the same fall in every 10ft., or in a length of 50ft. the difference of water levels should be two and a half inches.

Illustrations of Colour.—This exhibit is designed to show the effect of contrast when different colours are placed in certain positions with respect to each other, also the different effects of the mixture of certain colours, and the tests for colour blindness.

Mr. C. T. Whitmell, H.M. Inspector of Schools, who has made a close study of the subject, has kindly lent the apparatus.

Electric Welding.—During the past few years two processes have been introduced for welding metals by means of electric currents. In the Barnardos process, which has been worked out by Messrs. Lloyd & Lloyd, of Birmingham, the intense heat of the Voltaic arc is utilised, the current being made to pass from a carbon pencil to the objects to be welded together, an arc of great length and enormous heating power being formed between them.

Messrs. Lloyd and Lloyd exhibit a large tube 10ft. long, 10in. diameter, to which flanges have been welded by their process, and to which also flanged tubes 7in. diameter have also been welded by the same process for branches, and some smaller samples.

Mr. A. E. Smithson, West Bute Street, is the local agent of Messrs. Lloyd and Lloyd, and it is through him the exhibit is made.

Improved Lenses and Reflectors for Ship's Lights.—This apparatus is designed to utilise more fully than has hitherto been possible the back and other rays that are not in the arc covered by the lamps when in use, thereby considerably intensifying the light given in the required direction without increasing the size of the

burner. The inventor is Sir Alfred Loftus, recently Hydrographer to the Siamese Navy, by whom the apparatus are exhibited. The makers are Messrs. Polkey and Co., Birmingham.

Ship's Course Recorder.—The object of this invention is to show at a glance, in the captain's cabin, or any other convenient place, what the deviations from the proper course have been during a certain time.

In the apparatus shown, a strip of ribbon is fed forward by means of clockwork, just as in the Morse and other telegraph instruments. At certain intervals the strip is punched, and the line of the holes made by the punch in succession shows the deviations from the course.

The puncher is controlled by powerful permanent magnets, immersed in liquid, the whole being suspended on gimbals.

Mr. Alfred Wrigley, of Liverpool, is the inventor.

Spherical Ventilator.—This is an apparatus designed for use on board ship, for ventilating holds, saloons, stokeholds, galleys, &c. It is claimed that the apparatus has a higher efficiency, and is more durable than other forms of ventilators, and that water cannot find its way into the apparatus. The ventilator is automatic, and needs no altering with changes of wind, nor closing in bad weather. The makers are the "Acme" Ventilating and Heating Co., Liverpool, who exhibit the apparatus through their district agent, Mr. S. H. Owen, Exchange Buildings, Cardiff.

Improved Screw Propeller.—This is an apparatus, in which, by means of a special arrangement of four blades, the inventor claims that he is able to obtain higher speed, less slip, and greater efficiency. The model shown will show the special construction. The inventor is Mr. William Evans, Bute Chambers, Cardiff, by whom the model is exhibited.

Wyndham's Water Cushion Valve.—These valves are used for air pumps, feed pumps, &c. The great improvement claimed by the inventor is that the working part of the valve, in place of knocking against the seat at every stroke of the pump, is prevented from doing so by a cushion of water between the two parts. The result claimed by the inventor is that the valve has a very much longer life. The specimens exhibited are made by the inventor, Mr. J. S. Wyndham, Collingdon Road, Cardiff.

In this section are also exhibited cases of specialties by the following manufacturers:—Messrs. Maclellan & Co., Messrs. Billington and Newton, Messrs. Lloyd and Lloyd; Cardiff representative, Mr. A. E. Smithson; Messrs. Richards & Co., plastic metal manufacturers, Cardiff representative, Mr. Tom Kerman.

Magnolia Metal.—This metal is used for lining bearings, so that in place of a bearing brass being discarded when worn, it can be simply bored out, rebushed to size with magnolia, and rebushed again and again as each lining wears.

Electric Ship's Engine Room and Steering Telegraph and Engine Counter.—This is an apparatus designed to take the place of the ordinary Mechanical Telegraph between the bridge and the engine room. It is also designed as a Steering Telegraph where the wheel is aft and some distance from the bridge.

The motive power in the transmitter is a strong coiled spring, which is put in motion by the handle. A series of contacts are made at the same time as the handle moves round the dial.

In the receiver, a series of Electro-Magnets, whose coils are energised in succession, are made to actuate a toothed wheel, by means of simple mechanism, the pointer needle passing round the dial, as the wheel moves, and the latter moving in unison with the transmitting handle.

When the apparatus is used as a Steering Telegraph, the wheel or the tiller is made to automatically show on the bridge instrument the position taken up by itself. The source of current for the receivers is a battery of Leclanch cells.

Messrs. Elliot Bros., 101, St. Martin's Lane, London, W.C., are the exhibitors.

Lanterns.—Mr. S. W. Allen, of the Exchange, Cardiff, who has given a great deal of attention to this kind of work, exhibits a Triple Optical Lantern and a New Patent Simple Dissolving Lecture Lantern.

Small Alternate Current Dynamo and Small Continuous Current Shunt Wound Dynamo. — These machines have been made at the works of the Barry Graving Dock Company, at Barry Dock, entirely from the designs and under the superintendance of Mr. David Lowden, who also exhibits them.

The Alternate Current Dynamo has been made to overcome a difficulty in distributing the current for Electric Lights to some workshops on the opposite side of the Dock. Mr. Lowden intends to run the alternator in the engine house with the other machines, at 200 volts, carry a current of 4 ampères across the dock by means of a No. 16 copper wire, and then transform it down to 50 volts for the incandescent lamps that are required there.

The Small Continuous Current Machine is intended for country house lighting, to be used in connection with accumulators.

The Continuous Current Dynamo furnishes 70 volts, and 16 ampères, at 1,200 revs. per minute, with 100 complete reversals of current per minute.

Pianoforte Wire Sounding Machine.—This apparatus is the invention of Lord Kelvin (Sir William

Thomson). It is designed to and has successfully overcome the old difficulty of taking deep sea soundings.

In place of a wooden reel with a white line on it, a long length of which was taken in coils outside the ship, the latter being hove to for that purpose, a thin steel wire, similar to those used in the manufacture of pianofortes, is coiled on a drum and is run off over the stern of the ship whenever a sounding is to be taken, the depth being registered on the drum, after allowance has been made for the curve taken by the wire. The lead which is attached to the lower end of the wire is fitted with a valve, so that a certain quantity of the material of the bottom is brought up securely, and has also a registering apparatus if required.

The apparatus is manufactured by Messrs. James White & Co., Glasgow, by whom it is exhibited through their agent, Mr. Tom Williams, Bute Docks, Cardiff.

Arrangement for the protection of Propeller Shafts from galvanic action in the neighbourhood of the Brass Sleeves.—In this arrangement, the ends of the sleeves are bored out to form a recess inside. Into this recess putty is forced by means of a putty pump, means being provided to allow the air to escape in front of the putty, and to prevent the latter coming out beyond the end of the sleeve. When the recess is full of putty, the whole is allowed to set hard, and the entire shaft painted over with several coats of paint. The effect of the arrangement is to prevent the salt water from working in between the shaft and its sleeve, and corroding the former.

Mr. Edward Jordan, manager of the Cardiff Junction Dry Dock and Engineering Co., is the inventor, and the exhibitor of the shaft showing the method.

Coal Shipping Crane.—This is a model of an apparatus designed especially for placing the friable Welsh Coal on board ship without breaking, thereby avoiding the creation of quantities of small coal.

The apparatus consists of a double jib crane, arranged to stand over the rails by the dock side, and to move along them to any required position; an inclined plane with rails leads the truck with its load under the jibs. There it enters a cage, which is slung vertically from the jibs, is raised over the ship's side, lowered into the hold, and the truck then gently inclined, the coal being let out from one end in the usual way.

After unloading, the truck is allowed to assume the horizontal position in the cage. It is raised out of the hold, landed on the base of the crane, and run off down the inclined rails, another truck taking its place.

The inventor is Mr. R. Laybourne, and the makers, The Isca Foundry and Engineering Co., Newport, by whom the model is exhibited.

Model of Electric Winch.—This is an apparatus intended for use on board ship, on quays, wharves, dock sides, &c.

It consists of an ordinary winch, driven by an electromotor and worm gearing. By clutch gearing, either or both sides of the winch can be used, so that three speeds are obtained. The speed of the driving motor can also be varied, if desired, by any of the methods usually employed, such as by altering the arrangement of the connections to the field magnets, by varying the strength of the current passing into the motor, &c. The motor would be supplied with current from the same dynamo that furnishes the electric light, if used on board ship, or if many winches are employed a separate dynamo could be used for them. On shore, the current would be taken from the regular supply service. The makers are Messrs. R. B. Bolton & Co., 110, Leadenhall Street, London, E.C., who have kindly lent the model for exhibition.

Electrical Fittings for Ships.—This is a general

exhibit of fittings for use with electric light on board ship, including some specially strong switches, automatic cut-outs, guarded fittings for stoke-holes, &c., portable secondary battery lamp, dry battery cells, that are now coming in to avoid the trouble caused by the liquid in the jars slopping over. These are exhibited by S. F. Walker & Co., Cardiff.

Electrical Apparatus for speaking between Ships at Sea, or between Ships and the Shore, without Wires or Cables.—The principle upon which this apparatus is designed is the fact that when an electric current is sent through a conducting mass, such as a body of water, it not only passes by the shortest path, but by every other path that is open to it. Thus when two metal plates, connected to the terminals of a generator of electric current, are immersed in water, the current passes not only by the direct and shortest path between the plates, but also in curves extending in all directions, with the line between the plates as a chord. If two other plates connected to an apparatus that will respond to electric currents be also immersed in the same body of water, a current will be received from the water which will work the receiving apparatus if sensitive enough.

It is intended that ships shall have plates at their bow and stern connected to speaking apparatus on board.

Up to a certain distance it is found that the ordinary telephonic apparatus in every day use may be employed, beyond that special apparatus will be required to accommodate the currents set out.

The longest distance spoken over at present is from one side of the river Taff to the other, at a point where it is 50 yards wide. The matter is being developed as time can be spared.

The model exhibited shows the principle of the apparatus, there being no path for the current but through the water.

The apparatus is designed and exhibited by Mr. Sydney F. Walker, of Cardiff.

Electric Heating and Cooking Apparatus.—This apparatus is intended to illustrate the recently developed process of heating and cooking by means of electric currents. In all the apparatus shown, an electric current passing through a strip of copper embedded in enamel, performs the same office that the gas flames do in the well-known series of gas cooking and heating apparatus, but with the entire absence of flame or smell. Thus in the kettle boiler, the plate on which the kettle stands becomes hot; in the flat iron, the base of the iron itself becomes hot; in the oven the sides and back, &c.

All that is necessary when using the apparatus, providing there is a supply of electric current laid on, is to make the connection between the heating apparatus and the service wires, by means of the flexible cord and connecting pieces shown.

The principle of the apparatus is that the passage of the current through the copper strip being resisted, the current becomes thereby converted into heat, just as it is in electric lamps, and the heat, instead of being converted into light, is utilized for the purposes shown.

Messrs. Crompton & Co. are the makers of the apparatus, who exhibit through Messrs. Sydney F. Walker & Co., of Cardiff.

Microscopes.—A series of Microscopes were arranged in the small room under the organ, and in the course of the evening specimens of Bacteria and other objects of interest were shown by Dr. Charles Vachell, M.D., who kindly lent the microscopes for the occasion.

The Phonograph.—The celebrated invention is based upon the fact that a thin iron plate, when spoken to, will vibrate in unison with the sound waves created

by the voice. Attached to the iron plate referred to is a steel point, which in the later forms of phonograph is made to draw an indented curved line on a wax cylinder arranged for the purpose.

This cylinder on being turned by the hand, or as in Edison's instrument, by an electro motor, faithfully reproduces the sound waves that originally traced the lines on the cylinder, and with the sound waves, the actual voice with its tones, inflexions, &c.

The apparatus shown was of Edison's later designs, and was brought down from London specially for the occasion.

Drawings.—By the kindness of Mr. Key, Manager of the Wallsend Pontoon Company, a series of drawings were shown illustrating the development of the compound engine.

Models.—By the kindness of Mr. Thomas Reed, Consulting Engineer, Cardiff.—Model of seamless steel boat, and a model of ship's donkey boiler.

By the kindness of Mr. M. Aisbitt.—Model of coffer dam.

By the kindness of Mr. Dagleish.—Model showing the circulation of water in the boiler.

Show Cases.—By the kindness of Mr. Tom Kerman, West Bute Street.—Richard's plastic metal for lining bearings, and for protecting the outside of iron pipes. Samples of principal kinds of packing in use for modern marine engines, patent piston rings, gauge glass washers, lubricator.

At 10 p.m. the body of the hall was cleared for dancing, which continued till 12 o'clock midnight, when the guests departed, special trains having been arranged to suit that hour for those living outside the town.

On every hand the President and Members of the Institute were congratulated, the conversazione being pronounced a success by all present.

The following letter was received by Dr. Elliott from the Secretary of the Institution of Naval Architects shortly after the visit :—

INSTITUTE OF NAVAL ARCHITECTS,
5, ADELPHI TERRACE,
LONDON, W.C.

July 17, 1893.

DEAR PROFESSOR ELLIOTT,

I am instructed by the Council of this Institution to communicate to you the subjoined resolution, which was unanimously passed at the general meeting held on Thursday, the 13th inst., viz. :

“That a cordial and grateful expression of thanks be voted to the President and Bristol Channel Centre of the Institution of Marine Engineers for the great kindness with which they have received the Institution at Cardiff, and for the hospitality which they have shown to its members.”

I may add that it is the unanimous opinion of our Council and members that they never more thoroughly enjoyed a meeting, that they were most happy all the time they were at Cardiff, and that they left your town with regret.

Believe me to be,

Dear Professor Elliott,

Yours sincerely,

GEORGE HOLMES,

Secretary.

PROFESSOR ELLIOTT,

President of the Bristol Channel Centre
of the Institution of Marine Engineers.

On the 3rd of May, 1893, a paper on the "Sizing of Marine Engines," was read by Dr. Elliott. This he undertook to do at the special request of the Committee, but only on condition that some of the other members would also come forward in this direction. Mr. Joseph Williams thereupon responded with the promise which resulted in the production of his paper on the "Errors of Experts."

Their example has since been followed by Mr. M. W. Aisbitt and Mr. S. W. Allen, as mentioned further on.

VISIT TO THE SEVERN TUNNEL WORKS.

A visit of the members was made to the Severn Tunnel works on September 23rd. The party left Cardiff about noon and proceeded by train, in specially reserved compartments, to Portskewett. Here they were met by Mr. Richard Hosken, the local manager of the Great Western Railway Company, who conducted them to the pumping establishments in connection with the tunnel.

After viewing the massive Cornish pumping machinery, ventilating apparatus, and the method of working above ground, the company was divided in detachments of six or eight, and each detachment in turn having donned miners' overalls, under the guidance of Mr. Hosken or his assistants, was taken by a "lift" down the shaft, and then into the Severn Tunnel itself. Arrived at the bottom, they were led through a series of passages, shown the vast quantities of rushing water that had continually to be taken away and kept under control by the pumps; the ventilating arrangements and system of working were more fully explained, some trains were seen to pass through, and an ascent by means of the lift was again made to the surface. The party next proceeded to Chepstow by train, and a capital repast was partaken of at the "Beaufort Hotel." The Chairman (Dr. Elliott) moved that a hearty vote

of thanks be accorded Mr. Hosken for the great kindness and courtesy he had displayed in his reception of them. This was seconded by Mr. Field and carried with acclamation. The return journey to Cardiff was made about 9 p.m., and all present expressed satisfaction at the instructive and agreeable manner in which the time had been spent.

Two papers on "Damage Surveys" and "Mechanical Appliances for Shipment of Coal" were contributed by Mr. M. W. Aisbitt and Mr. S. W. Allen respectively, of the Bristol Channel Centre, and on February 24th they read these papers at Gresham College, London, before a large meeting of the London members, over which Mr. W. H. White, C.B., presided. The Local President of the Bristol Channel Centre (Dr. Elliott), the Vice-President, and Hon. Secretary were also present.

A second smoking concert was held in the large banqueting hall of the "Royal Hotel," Cardiff, on 27th January, 1894. The President of the Bristol Channel Centre (Dr. Elliott) occupied the chair, and he was supported by Sir E. J. Reed, the Mayor of Cardiff, Colonel Page, General Hume, Mr. C. A. Heywood (Vice-President Cardiff Chamber of Commerce) and about three hundred members and friends. An extensive musical programme was provided, the proceedings from first to last being highly enjoyable. In the course of the evening,

The PRESIDENT proposed "Our Distinguished Visitors," coupling the toast with the name of the Mayor of Cardiff. He said it would ill become them to ignore the presence of the many distinguished gentlemen who had honoured their Institute by attending that evening. It was highly gratifying to the members of the Institute that those gentlemen, holding influential positions in connection with the great commercial centre to which they belong, were the first to recognise the importance of the duties devolving upon the marine.

engineers of the country. Having regard to the fact that the ships of our Navy were replete with mechanisms, requiring the constant attention of the engineer, he had no hesitation in claiming that the engineers really constituted the "first line of defence"; or, at least, must be considered the second line of defence. He had great pleasure in submitting the toast, which he felt sure would have a cordial reception at their hands.

The MAYOR thanked the assembly for the hearty manner in which the toast was received, and was glad to be present at a gathering connected with an Institute whose members followed a profession, the importance of which was thoroughly recognised in Cardiff. As he had dwelt on about fifty subjects that week, they must excuse him from making anything approaching a speech. He would therefore simply thank them for the kindness with which his name had been received, and merely added, that if he had done anything to benefit and advance Cardiff he had but done his duty. (Applause.) He was delighted to see such a large number of gentlemen whose work was so important to the commercial life of the nation, and hoped their Society would increase in strength and usefulness, and that year by year they might have as happy gatherings as that they were then holding. (Applause.)

The PRESIDENT said—It affords me considerable gratification to submit the next toast, which is that of the "Health of Our New Members," including Sir Edward Reed, who, besides being the Member for Cardiff, may be fairly considered by us as the representative of the Bristol Channel Centre of our Institute in Parliament. (Hear, hear.) He has been admitted to our own Institute, and we are proud to possess him as a member, for his efforts during the time he was at the Admiralty to improve the position of the Admiralty Engineers. (Applause.) I feel certain that he will renew those efforts at the first favourable opportunity, for it is beyond question that the engineers of the Royal Navy,

when one considers the importance of the work they fulfil, should be placed on a better footing than that they now occupy. (Hear, hear.) We know that in the future our battles on the sea will be fought not so much by the man in the cabin and on the bridge as by the man in the engine-room—the man who can be relied upon in every emergency, whether it is a gun or a winch that has gone wrong. The services of engineers in the Navy are not sufficiently appreciated, and they are not ranked high enough. If Sir Edward Reed can induce the Admiralty to do what foreign nations have done in this direction men will be more ready to seek employment in the Navy, instead of, as at present, preferring to enter the merchant service, or seeking to make their mark in private practice. (Hear, hear.) I have great pleasure in proposing the health of “Our New Members,” coupled with the name of Sir Edward Reed. (Applause.)

The toast was accorded musical honours, and

Sir EDWARD REED, in reply, said—I daresay some of you may have observed that just now when “the guests” were so kindly treated by you, I took my part as a member. I was not going to sacrifice my privilege as a member of this Institute you have done me the honour of electing me to, by standing here as a guest. I declare my characteristic, and am very pleased to be here as one of yourselves. With regard to the remarks that the President has made, perhaps I may be able to throw a little light upon the situation. The question of the position of engineers in the Navy is, as the President has observed, one which I have felt an interest in. Standing upon the staircase of my house in London is a life-sized portrait of myself presented to my wife in recognition of what the engineers of the Royal Navy were pleased to consider the services that I have endeavoured to render them over a number of years, so that one may consider that as a certificate that one has not in past days been negligent of the interests of the marine engineer. (Hear, hear.) At

the same time I am bound to say that, although, while I was at the Admiralty, I was charged with the whole responsibility for ships and engines, and was at that time practically at the head of the marine engineers of the Royal Navy, I had no opportunity during the short time I was there of performing, except in a very limited way, the gigantic work of arousing the Admiralty to the modern situation with regard to marine engineers. Why, sir, I confirm absolutely, and go far beyond the statement you made just now. You may have observed, perhaps, that in the recent agitation about strengthening the Navy I have not said very much, and for one reason, that I am waiting for the opportunity when I may point out, if possible, with some effect, that it is the idlest folly in the world to keep spending money incessantly, and by millions, upon the *materiel* of the Navy, and neglecting, as we are, and for years have been neglecting, the *personnel* of the Navy, in respect of that branch of the service upon which the whole vitality and performance of a warship has mainly to depend. (Hear, hear.) Sir, I remember a few years ago, when the first of the very fast torpedo-catchers was being built at the yard of Messrs. Laird, of Birkenhead, going on board the vessel. It was the *Rattlesnake*, and I found her, as I knew I should find her, one mass of machinery from stem to stern, and from the keelson to more than the upper deck. Every operation of that ship had to be performed by steam. The anchor was weighed by steam; the guns were fought by steam; the ship, I need not say, was propelled by steam; and she was lighted by steam, for the electric light is nothing else but steam in a modified form. Every important operation of that vessel had to be performed by steam, and meant work for the chief engineer. I went below into the engine-room and inquired for him, and presently he came crawling out from a corner, in a canvas suit, where he had been attending to some detail of the work. When we got into conversation, I asked him, "How many acting first officers of marine engineers have you on your staff?" He replied, "Not one; I am the only one .

allowed by the Admiralty to this ship." A little later that ship was commissioned with no less than five officers of the third class. I drew attention to that in the House of Commons, and a second engineer was appointed to that vessel. (Applause.) I do not understand, when we have passed into an age in which all the operations of war are to be performed by or through the engineer, why he should be treated as a subordinate person. (Hear, hear.) I will not attempt a speech—it is too late—but I want to say this : in my humble opinion, in consequence of the depreciation by the naval officer element of the engineer class, this country is in greater danger than from any want of ships whatever. I believe we want more ships, undoubtedly ; but much more than the want of ships is the want of engineer officers for the naval service. (Hear, hear.) Is it to be wondered at ? How do we manage our Navy ? Up to this day, sir, as you know—up to this hour, there is not a representative of marine engineering upon the Board of Admiralty. There are three Admirals who, however well qualified to sit on the Board, cannot boast of being marine engineers, and two or three others, whose recognised, avowed, and proclaimed qualification for the office is total ignorance of the service. I do not want to say anything unfriendly of the present Board of Admiralty, but when Lord George Hamilton said to me the other day, after his resolution had been proposed in the House of Commons, "I thought we should have had your support," I said, "I may think highly of Lord Spencer's and Sir U. K. Shuttleworth's qualifications as managers of the naval service, considering they knew nothing about it a year ago. They may be highly qualified men ; only, when you call upon the House of Commons on Tuesday to vote on Friday, in the belief that these gentlemen have produced a full and sufficient programme for the Navy, you have a precious sight more confidence in them than I have." Well, it is too late to go fully into the question—(cries of "Go on !")—but I should like to say one thing more. My esteemed friend, for I know no man whom I admire

and regard more, although a Conservative member of the House of Commons—I mean Mr. John Penn—took up the question of the insufficient and inadequate supply of marine engineers for the naval service, and took a great deal of pains about it, but he was grievously disappointed with the decision of the Board of Admiralty. When the time comes, I hope I shall be able to assist him and others in giving effect to the views which must be universally held here. (Applause.) In conclusion, I have only to add, and I am bound to recognise it, that the views of men like yourselves, making yourselves heard and your influence felt, will be of great assistance to myself and everybody else who wishes to see the naval service of the country placed upon a proper footing. (Applause.) Further, I wish to express my thanks to you for electing me a member of your important body, and to Professor Elliott who, since he has taken an important position in this town, has done all he can to advance those interests which are committed to him, to you, and to myself. (Applause.)

Mr. C. A. HEYWOOD proposed “The Health of the Chairman,” and, in doing so, referred in complimentary terms to the pleasing part which the Bristol Channel Centre of the Institute had taken in contributing to the success of the recent visit to Cardiff paid by the naval architects. The PRESIDENT briefly returned thanks, and the proceedings closed with the National Anthem.

As an experiment, and for the purpose of raising discussions, short papers were contributed by Mr. E. Jones and Mr. John McCallum, the result in each case being very satisfactory.

As hitherto, the mainstay of the Bristol Channel Centre has been the President, Professor Elliott, who has spared neither time nor energy in helping it forward.

Mr. David Gibson (Vice-President). Mr. Charles L. Ryder (Hon. Treasurer), Mr. E. John (Representative to Council), and Messrs. R. Davison, R. J. Field, J. McCallum, Jas. Ferrier, and Joseph Williams, who comprise the Committee, have also been enthusiastic in their efforts to maintain and extend the influence of the Institute.

Advantage must also be taken of this opportunity to thank Mr. Jas. Adamson (Hon. Secretary), and the Members of the Council in London for the interest taken in, and courtesy they have at all times displayed towards the Centre. When application has been made to them their assistance and advice has always been most readily forthcoming.

The Senate of the University College, Cardiff, has been most indulgent to the Centre, a lecture-room being at the disposal of the members whenever required for conducting the meetings.

GEORGE SLOGGETT,

Honorary Local Secretary.

SOUTHAMPTON CENTRE.

The Honorary Secretary also read the subjoined communication that had been received from Mr. Griffiths, the Local Honorary Secretary for Southampton, and added that the remarks of Mr. Griffiths would be supplemented by Mr. Murray, one of the Southampton members, who was present:—

SOUTHAMPTON,

15th March, 1894.

I have the honour to inform you that the Local Committee, after considerable trouble, have succeeded in obtaining the use of the Council Chamber of the Hartley Institution once a fortnight during the winter months, for the purpose of reading and discussing the various Papers, at a rent of 10/6 per night, that being the amount paid by the Literary and Philosophical

Society for similar accommodation ; and we now only await the sanction of the parent Institution to complete the negociation. I may also mention we are in treaty for suitable rooms for the use of the Centre entirely, which belong to the Railway Company here, now used as an Art Gallery, and our Honorary Member (Mr. John Dixon) is interesting himself in the matter, though as the present lease does not expire till the autumn, we could not possibly obtain them till then. We purpose calling a General Meeting here next week to decide on a formal opening of the Centre probably with a dinner, and the Committee would like the new President (to be elected to-morrow) to make this his first official act in connection with the Institution. Will you please therefore approach him at once and get him to fix positively as early a date as possible for the purpose, and we will make our arrangements to suit his. Our Mr. Murray, who will be present to-morrow, will be able to explain anything further, but as time is now pressing, I hope to receive the sanction of the Council to expenditure for room, and to hear a date fixed upon by the new President without delay.

J. GRIFFITHS,

Honorary Local Secretary.

Mr. C. W. MURRAY (Member of Committee): Mr. Chairman and Gentlemen, I have to state that Mr. C. S. Du Sautoy, the President of our Centre, very much regrets his inability to be present to-night. He was naturally anxious to attend this meeting and give some account of what is being done in the establishment of our local branch, but, unfortunately, important business has rendered it impossible for him to leave Southampton just now. Under the circumstances, perhaps you will allow me briefly to supplement the Secretary's report. The formation of a Local Centre of the Institute at Southampton has been the subject of negotiation between Mr. Du Sautoy and the Council for a considerable time, the correspondence having been commenced in December, 1892, and continued until February 1st, 1894, on which

date a meeting of Certificated Engineers was held at Southampton, in order to give the matter consideration. At this meeting it was unanimously resolved that a local centre should be established, with Mr. Du Sautoy as the first President, and the gentlemen whose names have been given in the Local Secretary's report were elected to form a Committee. I think it will be agreed that the Committee is, at least, fairly representative of the various engineering interests connected with the port. It includes Mr. L. Steele (Board of Trade Surveyor), Mr. R. W. Coomber (Lloyd's Engineer Surveyor), Mr. A. Brown (Superintendent Engineer, Isle of Wight and South of England Steam Packet Company), and Mr. R. MacIntosh (Deputy Superintendent Engineer of the Royal Mail Steam Packet Company). Mr. John Dixon (Dock Master and Marine Superintendent of the L & S. W. R. Company) is an Honorary Member, and among the members are Messrs. A. and G. Day (of the Northam Ironworks), Mr. H. Arthur (Superintendent Engineer of the Royal Mail Steam Packet Company), and Mr. Boothroyd (Assistant Superintendent Engineer of the American Line). As to numbers, at our first meeting we had but three members of the parent Institute; during the ensuing six weeks our total has been brought to 47 Members, 8 Associate Members and 1 Honorary Member, 56 in all, while fresh applications are being received daily. For the reading and discussion of papers, the Committee have secured the use of the Hartley Institution Council Chamber, a room in every way adapted for the purpose, and negotiations for the use of premises suitable for the general purposes of the Institute are now being carried on. Preparations are also being made for the formal public opening of the Centre at an early date, and it is hoped that our new President will be able and willing to be with us on that occasion in his official capacity. May I therefore ask that the Council will bring its influence to bear in this direction. We are strongly of opinion that a visit by the President to Southampton would be conducive to the best interests of the Institution generally, as well as those of the Local Branch.

Mr. J. R. RUTHVEN, speaking on the subject of Local Centres, said: Mr. Chairman and Gentlemen, the extension of the Institute has been marked this Session by the establishment of Local Centres at Bombay and Southampton. There are now three Local Centres, namely, the Bristol Channel Centre at Cardiff, the Bombay and Southampton Centres. The Convener of the Extension Committee would be glad to hear from members in other parts, with the object of establishing Centres where the Institute is not already represented. All information on this subject can be obtained by writing to the Honorary Secretary or the Convener of the Extension Committee.

At this stage the proceedings were adjourned for a short period, and on the meeting resuming:—

The CHAIRMAN said: Gentlemen, I find, from the programme, that it is now my duty to propose the adoption of the reports, but that of course will be subject to the resolution of Mr. Gray which the meeting has carried. Subject to this condition, I beg to propose that the reports read to-night be adopted and published in the Transactions.

Mr. A. W. ANDERSON seconded the motion, which was carried unanimously.

The SCRUTINEERS then reported that the voting for Office-bearers and Members of Council for the ensuing year had resulted in the election of the following:—

President: SIR THOMAS SUTHERLAND, M.P.

Honorary Treasurer: MR. R. LESLIE.

Honorary Secretary: MR. JAMES ADAMSON.

Members of Council:

MR. J. H. THOMSON.

„ S. C. SAGE.

„ W. J. CRAIG.

MR. J. G. LATTA.

„ D. BROWN.

„ MCFARLANE GRAY.

Representative of Bristol Channel Centre: MR. E. JOHN.

Honorary Minute Secretary: MR. C. G. NEWBY.

BRISTOL CHANNEL CENTRE.

President : PROF. A. C. ELLIOT, D.Sc.

Vice-President : MR. DAVID GIBSON.

Honorary Treasurer : MR. C. L. RYDER.

Honorary Secretary : MR. GEO. SLOGGETT.

Members of Committee :

MR. H. CAMBRIDGE.

MR. J. FIELD.

„ R. DAVISON.

„ J. McCALLUM.

„ J. FERRIER.

„ JOS. WILLIAMS.

MR. G. W. MANUEL : MR. Chairman and Gentlemen, I have very great pleasure in proposing a vote of thanks to our late president, Dr. White. It was a great honour for this Society to have had a President so distinguished as Dr. White, and I am pleased to see that it is chronicled in the report that the records of the Session, under the presidency of Dr. White, show the Institute of Marine Engineers “to be still growing in practical usefulness, and increasing in prosperity.” Dr. White holds a very high position, as you all know, and although he could not be with you so often, perhaps, as we would have liked, still, his heart was with you, and it is well to have such a friend as Dr. White. I know Dr. White, and I feel that he is your friend, and, although he has retired from the office of President, he may be able to assist us further on. I am sure that the resolution is one which you will all cordially agree with. I would like to couple with it the name of his good lady, Mrs. White, because she took a little part in our proceedings. She came down here on two occasions, and her attendance was highly appreciated by the members of the Institute. I will not say anything further, but simply propose this vote of thanks to Dr. White, and long may he continue in the position he now occupies, which is one of the highest in his profession in this or any other country.

Mr. LOCKIE : Just in a word, I would beg to second the motion which Mr. Manuel has proposed, namely, that we accord a hearty vote of thanks to Dr. White, and also to his wife. After what Mr. Manuel has said, there is very little left for me to add ; but I should just like to say that I think the success of this Institute has been, in a great measure, due to the judicious way in which the Presidents have been chosen. I am quite sure of this, that we all feel very much indebted to Dr. White for having honoured us by becoming our President.

The motion was carried unanimously with cheers.

Mr. T. F. AUKLAND : Mr. Chairman and Gentlemen, I rise with very great pleasure indeed to propose a vote of thanks to the Office-bearers and the Members of the Council of the Institute of Marine Engineers, because I think that upon them depends so much the success which has attended this Institution. I regard this success as quite unparalled, for I know of no other institution which, within so short a period as has elapsed between November, 1888, and March, 1894, has made such tremendous strides as the Institute of Marine Engineers. This success is certainly mainly due to those gentlemen. Our friend, Mr. Lockie, made a remark just now to the effect that the success of the Institute was, in a great measure, due to the fact that the Council had been wise in their choice of Presidents, showing that the members of the Council, themselves, were wise men. They have certainly done wonderfully well in this direction for the benefit of this Institution. I, therefore, propose, with very great pleasure, a very hearty vote of thanks to the Office-bearers and Members of the Council, and I am sure that the resolution expresses the thanks, not only of all those who are present, but also of the members of the Institute generally.

Mr. JAS. Y. LOWE : After what has been said by the proposer of this vote of thanks to the retiring Office-bearers and Members of the Council, it is quite un-

ante-rooms, and during the evening, At 7 the Concert was opened in the large Hall, the following was the Programme :—

PART I.

Overture	... "Espoir d'Alsace"	... THE ORCHESTRAL BAND.
Glee	... "The Sailor's Song"	ARIEL QUARTETTE PARTY.
Song	... "Always together"	... MADAME WESTON.
Humorous Recital	"The Two Scars"	... MR. A. WIELAND.
Violin Solo	"Andante and Finale"	MR. B. M. CARRODUS.
Song	"The Boatman"	... MISS E. BEVANS.
Song	"My Dream"	... MR. H. BRADEN.
Glee	"The Gosling"	ARIEL QUARTETTE PARTY.
Ventriloquial Entertainment	... "The Gosling"	... PROF. PYM BROWNING.

PART II.

Song	... "Annie Laurie"	... MADAME WESTON.
Violin Solo	"Mazurka"	... MR. B. M. CARRODUS.
Song	"Come into the Garden, Maud"	MR. H. BRADEN.
Song	"Who was it?"	... MISS E. BEVANS.
Humorous Recital	"Is Marriage a failure?"	... MR. A. WIELAND.
Part Song	"On the banks of Allan Water"	ARIEL QUARTETTE PARTY.
Song	"Biddy Aroo"	... MR. F. CLIVE.
Song	"My old Kentucky Home"	... MR. H. WARD.
Selections	... ..	... THE ORCHESTRAL BAND.

While the Concert was in progress, in one of the other rooms several exceedingly interesting and instructive experiments were exhibited by Dr. Hermann Hoffert, of the Royal College of Science, South Kensington. The new Stereoscopic Lantern (*Anderton's*), operated by Messrs. Harvey and Peak, was explained, illustrations being thrown on a screen to show the effects of the polarised light. Professor Boys' experiments, showing soap bubbles and surface tension, also attracted considerable attention.

The following is a list of the exhibits which were kindly lent for the occasion :—

MODELS.	EXHIBITORS.
Paddle Steamer, "London Belle" ...	Mr. D. Brown (Member).
Axiom Lubricator and Pressure Gauge	do. do.
Engine and Boiler with Special Draught	Mr. N. S. Hawks do.
Valve Gear Motion (showing movements)	Mr. D. Joy do.
Web-bottomed Ship	Mr. E. F. Wailes do.
Piston, Packing Rings and Springs	Mr. W. Buckley do.

MODELS.	EXHIBITORS.
Reversible Screw Propeller	Mr. McGlasson (Hon. Member)
Reducing Valve, &c.	Messrs. Blundell Bros.
Trevithick's Road Engine and Safety Lamp	Mr. G. W. Manuel (P. President)
Steam Engine and Boilers	Mr. F. W. Wymer (Vice-President).
Dock Stanchions	Mr. D. Ovens.
Water Circulator in action	Mr. C. L. E. Melsom (Member)
Instantaneous Water Circulator	Mr. G. B. Shepherd do.
Whitehead and Pollock's Piston	Mr. P. Devlin do.
Ruthven's Rudder and Steering Gear	Mr. J. R. Ruthven (Member of Council)
Aspinall's Marine Governor	Mr. J. G. Martin (Member).
Glass Boiler, showing circulation	Mr. A. Gray.
Steeple Engine	Mr. J. Stewart do.
Companion Ladder and Windlass	Mr. J. Wotherspoon do.
Lubricator	Mr. W. Boaz do.
Tube Stopper and Expander	do. do.
Speaking Tube	Messrs. Binko.
Valves and Special Cocks	Messrs. Dewrance.
Glass Gauge Mountings, &c.	do.
Piston Rings and Springs	The Institute.

CASES.	EXHIBITORS.
Metal Packing and Specialities	Messrs. Walker.
Do. do.	Messrs. Melsom and Griffin.
Packing, Rubber Valves, &c.	The North British Rubber Co.
Asbestos, Samples of Crude and Manufactured Articles, Packing, &c.	The United Asbestos Co.

ILLUSTRATIONS.	EXHIBITORS.
Feed Heater and Cleaner	Mr. J. F. Halkett (Member).
Launch of E. I. Co.'s "Edinburgh"	Mr. J. F. Redman do.
Machinery "Duchess of Edinburgh"	Mr. F. Beckitt do.
Valve Gear	Mr. D. Joy do.
The "Industry"	The Institute.
The "City of Paris"	do.

Messrs. W. B. Dick & Co. exhibited samples of oils, oil yielding plants, fire extinguishers, &c. Mr. J. Slight exhibited objects and views by means of stereoscope and microscope. Messrs. Simmonds and McSweeney lent flowers and plants for decorating purposes.

The President and Mrs. White were present during the evening. Professor Elliot (President Bristol Channel Centre) and Mrs. Elliot were also present.

At 9.30 the Hall was cleared for dancing, which was entered into with great spirit, and kept up till the small hours of the morning.

The following was the Dance Programme :—

PART I.		PART II.	
DANCES.	MUSIC.	DANCES.	MUSIC.
1 Polka...	<i>Le Trompette du Garde</i>	11 Polka	<i>Chattermag</i>
2 Quadrille.....	<i>Comic Opera</i>	12 Lancers	<i>Edinboro'</i>
3 Valse.....	<i>Marietta</i>	13 Valse.....	<i>Andalusian</i>
4 Lancers	<i>Palace</i>	14 Quadrille.....	<i>Round the Town</i>
5 Schottische.....	<i>Black Watch</i>	15 Barn Dance.....	<i>Paquita</i>
6 Der Styrien.....	<i>Original</i>	16 Alberts.....	<i>Selected</i>
7 Marine Engineers' Quadrille	<i>Selected</i>	17 Valse	<i>Broken Vows</i>
1st Fig., 5th Quadrille		18 H. Schottische	<i>Maid of Perth</i>
2nd „ 1st Caledonians		19 Valse and Galop	<i>Good-Bye and Presto</i>
3rd „ 3rd Lancers			
4th „ Waltz Cotillon			
5th „ 5th Lancers			
8 Valse.....	<i>Veronica</i>		
9 H. Schottische.....	<i>Keel Row</i>		
10 Scotch Reel.....	<i>The Highlander</i>		

The arrangements were carried out by the Recreation Committee, under the Convenership of Mr. A. W. Robertson. The Concert and Dance Programmes were entrusted to Messrs. W. J. Taylor and G. Wiltshire. The arrangements for the Experiments and Lecture in the ante-room were entrusted to Mr. J. McFarlane Gray.

