SECOND VOLUME

OF

TRANSACTIONS

COMPRISING

PAPERS, DISCUSSIONS, AND REPORTS

FOR

SESSION 1890-91.

EDITED BY

JAS. ADAMSON,

HONORARY SECRETARY.

PUBLISHED PRICE:

— ONE GUINEA —

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John Gale

ANNUAL GENERAL MEETING,

HELD IN THE

LANGTHORNE ROOMS, STRATFORD,

ON

FRIDAY EVENING, 3rd APRIL, 1891.

PART I.

7.0 Opening Remarks—PRESIDENT.

MR. ADAM moved.
MR. SHEPHERD seconded.

7.10 The Appointment of Scrutineers

MESSRS. CRAIG and WILTSHIRE.

7.20 Annual Report—

HON. SECRETARY.

7.30 Financial Statement—

HON. TREASURER.

7.35 Vote of thanks to President

MR. H. W. WHITE moved.
MR. A. THOMSON seconded.

7.50 Vote of thanks to the Vice-Presidents and Council.

MR. L. MCKENZIE moved.
MR. NOBLE seconded.

8.0 Motion as to Alteration of By-Law

MR. W. W. WILSON moved.
MR. S. C. SAGE seconded.

8.20 Adjournment for Coffee.

PART II.

8.35 Declaration from Scrutineers

MR. WILTSHIRE.

8.40 Announcement as to Inaugural Address and Proposed Dinner

MR. L. P. COUBRO, Convener.

8.45 Remarks—General Objects of the Institute

MR. F. W. WYMER
MR. J. M. GRAY.

9.15 Remarks—A Building for the Institute and the Proposed Dinner

G. E. HODGKINSON, COM., R.N.
MR. CHURCHILL.

9.40 Remarks—Local Centres

MR. A. THOMSON.

9.50 Concluding Remarks.

The Langthorne Rooms,

Broadway, Stratford,

April 3rd, 1891.

Second

The Annual Meeting of the Institute of Marine Engineers was held here this evening, when, in the unavoidable absence of Mr. Manuel, the chair was occupied by Mr. F. W. Wymer, who, after briefly commenting upon the business of the evening as detailed in the programme, expressed regret that the President was not present to take his place.

The appointment of Scrutineers to examine the Voting Papers was moved by Mr. R. Adam and seconded by Mr. G. B. Shepherd. Messrs. W. J. Craig and G. Wiltshire were appointed.

The Annual Report was then read as follows :—

The advent of another year calls for a report and analysis of the past twelve months, and in compliance with the call, the following is submitted to the Members and Friends of the Institute, to show the progress which has been made and the work accomplished during the Session just closed.

In the early part of the Session, the first bound volume of Transactions was issued, embracing the Papers read during the first Session, February, 1889, to February, 1890. In all, about 160 copies of the Volume have been disposed of.

In order to make up these complete, Second Editions of Nos. 1, 4, and 5 Papers were printed.

During the past year twelve Papers have been read and discussed. These Papers are all being published and forwarded to Members.

The following is a list of the

Date.	No. of Paper.	Subject.
March 4th	12	Friction of Screw Propelling Engines .. ..
„ 11th	13	Coal .. ..
„ 29th		First Annual General Meeting (Session 1889-90)
April 1st	12	Discussion .. ..
„ 15th	14	The Influence of Weather on Paddle Engines ..
„ „	15	Blowing up the Old Dock Wall (Royal Albert Dks.)
„ 29th	16	The Marine Engine Governor .. .. ..
May 6th	17	Electrical Engineering, Part I. .. .. ..
„ 20th	17	„ „ „ II. .. .. ..
„ 13th	18	Corrosion of Iron and Steel .. ..
„ 27th	19	Ventilation .. ..
Sept. 5th	20	Address and Quarterly Meeting .. .. ..
„ 16th	21	Water Jet Propulsion .. ..
Oct. 14th	20	Discussion .. ..
„ 25th	21	„ .. ..
Nov. 11th	22	Propellers .. ..
„ 25th	22	Discussion .. ..
Dec. 5th		Conversazione
„ 20th	23	Efficiency of Air Compressors .. .. ..
Jan. 27th, 1891	24	Capital and Labour .. ..

Meetings held and Papers read :—

	Author.
.. ..	Mr. W. J. N. Brett (Associate Member).
.. ..	Mr. G. Lloyd Morgan (Member).
.. ..	Mr. G. W. Manuel (Chairman).
.. ..	Mr. W. J. N. Brett's Paper.
.. ..	Mr. G. W. Buckwell (Member).
.. ..	Mr. J. Thomas (Hon. Member).
.. ..	Mr. J. D. Churchill (Member).
.. ..	Mr. R. E. Crompton (Hon. Mem.)
.. ..	,, ,, ,,
.. ..	Mr. D. Phillips (Member).
.. ..	Mr. D. G. Hoey (Hon. Member).
.. .	Mr. G. W. MANUEL (President).
.. ..	Mr. J. R. Ruthven (Hon. Min. Sec.)
.. ..	Mr. Manuel's Address.
.. ..	Mr. J. R. Ruthven's Paper.
.. ..	Mr. T. Drewry (Member).
.. ..	Mr. T. Drewry's Paper.
.. ..	Mr. Jas. Adamson (Hon. Sec.) Convener
.. ..	Mr. Jos. Williams (Member).
.. ..	Mr. F. W. Shorey (Member of Council).

The Membership at the end of the Financial Year numbered 452, as under :—

MEMBERS	351
HONORARY MEMBERS	28
ASSOCIATE MEMBERS..	34
ASSOCIATES	30
GRADUATES	9

Of these it is our painful duty to record the death of the following named Members during the year. Matthew Prior (Member of Council, and one who took an early and deep interest in the formation of the Institute). Andrew McMurchy (Member), whose genial manner and attention to duty endeared him to those who knew him best, also John Simpson, both of whom were lost at sea with their respective steamers. Alex. Young (Member), well known and respected during his long service in the P. & O. Company, and who but recently had retired from active service to a well-earned repose he was not long permitted to enjoy. W. J. Brown (Member); G. Pearson (Member), both of whom were removed from us, and their sorrowing relatives by accidental drowning. R. L. Gauldie (Member), who died after a lingering illness, resulting from influenza. In addition to these, one Member, one Associate, and one Graduate have resigned, having retired from Marine Engineering.

The question of more extended Premises conveniently situated for a majority of the Members has been engaging the attention of the Council for some time past. An offer was made to the Committee and negotiations were carried on in connection with that offer, to a certain point, when it was found that the terms were involved with limitations, such as to lead the Council to decide against any further consideration of the offer in question.

The number of volumes for the use of Members visiting the Reading Room has considerably increased during the year, both in the Campbell Memorial Loan Collection and the Institute Library. The catalogues appended, being completed up to date, show the number of volumes in the Campbell Memorial collection to be 197, or an increase of 43 vols., and in the Institute collection 258, or an increase of 81 vols. during the year.

The question of a Circulating Library has not yet been settled, but the desirability of having such has not been overlooked.

The Reading Room has been kept open every evening and well supplied with Journals every week, chiefly by voluntary contributions from Members, to whom our thanks are due for their liberality in respect to, not only the Reading Room Table, but their donations otherwise.

The Journals which have thus been used in the Reading Room during the year have been presented to the Trustees of the Campbell Memorial collection, who have had them bound in volumes and placed in the Loan Collection, which is open for the use of Members of the Institute.

Members who have contributed to the Library Fund will find their contributions acknowledged, if not in the Library Fund, in the catalogue opposite to the book or books which have been purchased with their contributions.

It was considered desirable to have fixed evenings for meetings throughout the Session, so that Members might know when such should be held, without reference to a circular. The 2nd and 4th Tuesdays of each month during the Session were decided upon, and this arrangement has been adhered to, with one or two exceptions. It is extremely desirable that every member (inclusive of Honorary Members, Associate Members, Associates, and Graduates), should contribute to some extent to the transactions of the Institute, either by a paper, notes, comments, or remarks on subjects under discussion or about to be discussed, so that by a comparison of experiences and opinions, the questions which crop up from time to time may be the more readily solved for the common weal.

The Scrap Book for notices and cuttings of interest to the members, offers at once a means of communication and contribution from any part of the world. It is suggested that Members should bear this in mind and send, addressed to the *Convener, Press notices and cuttings Committee*, any such which they may meet with likely to prove useful or interesting.

Towards the erection or purchase of suitable premises, spontaneous offers and contributions have been made to the extent of £282. The balance sheet shews the amount actually received at the end of January.

The second annual conversazione was held on Friday, 5th December, 1890, in the Town Hall, Stratford, presided over by Mr. Manuel. Several new features were introduced in addition to the arrangements of the previous year. The following is a brief report of the Meeting which was productive of a very pleasant evening to all those who were so favoured by circumstances as to be present. The President delivered a brief address and gave a hearty welcome to the friends and visitors. Vocal and Instrumental Music was rendered by several friends during the evening, to whom we are indebted for their kindness and courtesy.

Mr. James Wimshurst of the Board of Trade, converted one of the Ante-Rooms into an Electrical Laboratory, and all the evening delighted a crowding audience with the marvels of that science in connection with which the Wimshurst Influence Machine has made his name so well known. In an adjoining room the new Edison Phonograph was worked by one of the staff of the Edison Co., recording and re-producing speech and music. Mr. Macfarlane Gray delivered a short address, which he had written for the occasion, graphically describing the production and transmission of sound waves in the air, and the construction and erection of the Telephone and the Phonograph. The concluding lines of his address were spoken into the Phonograph on the platform, and were immediately reproduced by that Instrument and heard distinctly all over the Main Hall. Mr. Pym Browning also gave his very interesting and amusing ventriloquial entertainment; while arranged around the Hall were microscopes, kindly lent by Messrs. Beck, Cheapside,—Photographs, kindly lent by Messrs. J. Adamson, Rothesay—Paintings, Engravings, Models, Specimens, and Samples, &c., &c., kindly lent by various friends to whom the thanks of the Committee and the Council have been accorded, were displayed on the tables and walls, these, with the decorations and flowers (kindly lent and arranged by Messrs. Simmons, Leytonstone) tended greatly to enhance the pleasure and interest of the assembly of ladies and gentlemen. After the programme was concluded, the hall was cleared and an hour-and-a-half was spent in dancing, the whole proceedings, with respect to the evening's entertainment, brought to a close amid much general satisfaction.

The property of the Institute has been added to by several members and friends. Some of the contributions are most interesting and valuable. A list is appended giving the names of contributors and their gifts.

Coal tests have been conducted on occasional Saturday evenings throughout the Session. The results are all tabulated, and are open for inspection in the Reading Room.

One local Centre called the Bristol Channel Centre has been so far arranged that a Chairman, Vice-chairman, and Honorary Local Secretary, were appointed in November. A deputation consisting of Professor Elliot, Messrs. John, Fownes, and Elms met the Council in the Langthorne Rooms, on January 27th, when a cordial understanding was come to, in reference to the broad principles on which the work of the Local Centre should be conducted and its close connections with the Main Centre maintained. The details were left for future consideration and arrangement.

It will be noticed with pleasure and satisfaction that the Senatus of the University College of South Wales and Monmouthshire has granted to the members of the Bristol Channel Centre, the free use, for the purpose of meetings, of certain rooms in the University College, Cardiff. A resolution was passed at a meeting of the local members of the Institute in Cardiff to the effect—" That the best thanks of the Institute of Marine Engineers be given to the Registrar and Council of the University College of South Wales and Monmouthshire for granting us the free use of rooms in the College for the purpose of holding local meetings."

The Members of the Institute resident on the Bristol Channel met in Cardiff on the under-mentioned dates when three of the Papers of the Session just closed were read and discussed as noted :

Date.	No. of Paper.	Subject.	Author.
Sept. 26th.	21	Water Jet Propulsion	Mr. J, R. Ruthven, read by the Hon. Local Secretary
Nov. 25th.	22	Propellers	Mr. T. Drewry, read by the Hon. Local Secretary
Feb. 25th.	23	The Efficiency of Air Compressors	Mr. Jos. Williams, read by the Author

In connection with the publication of several of the Papers, our thanks are due to the Editor of the " Marine Engineer " for his courtesy in presenting to the Institute the Blocks used for illustrating the Papers referred to.

This opportunity is also taken of publicly thanking the Editors and Proprietors of the various Journals, and other friends who have contributed in any way to advance the objects, and enlarge the sphere of usefulness, of the Institute.

The notices which have appeared in the Technical and other Journals and Papers from time to time call for our warmest thanks to the Press for the encouragement given in thus upholding the hands of the Council and Office Bearers amid the labour attached to the administration of affairs on behalf of the Membership.

In concluding this report, the attention of Members is directed to the motion as to the alteration of by-law, in respect to qualifications of membership.

JAS. ADAMSON,

Hon. Secretary.

The Honorary Treasurer, Mr. Leslie, submitted the Financial Statement, declaring a balance of over £400, as per detailed Balance Sheet.

Mr. H. W. White then moved a vote of thanks to the Retiring President, and said, "I have been requested to propose a vote of thanks to our worthy President on the completion of his first term in the chair of this Institute. This duty I perform with mixed feelings; pleasure, in being selected for the purpose, and pain that the occasion marks the termination of Mr. Manuel's presiding over us.

"That Mr. Manuel has been our President during a period when this Institute of Marine Engineers has made marked progress, is well-known to you all; in this, the parent Institute, papers of great merit have been read, criticised, and discussed in a thoroughly interesting and intelligent manner, and he would be hard to please who does not readily admit the information to be derived from these papers.

"As individuals, we have benefited, and what is of equal importance, this Institute has benefited also. A centre has been started at an important shipping port, membership has increased, and generally there is little doubt but that the Institute has done well. Of the part taken by our worthy and greatly respected President, you are all fully aware, and much as we must regret that he will soon cease to preside over us, we shall have the satisfaction of knowing that he will still be of us, and amongst us, and, I doubt not, be willing, as in the past, to give us the benefit of his experience and help when necessary. That Mr. Manuel has, in spite of the enormous pressure of his professional and official duties, found time to come down and preside over the meetings of the Institute is proof, if proof were needed, how deep and earnest is his interest in its well-being; and I say this, in no invidious sense or to institute comparisons, that I know of no one in his own line who has such everlasting anxieties and responsibilities as our President.

"I am certain, gentlemen, you will fully endorse all I have said—and I wish I could have said it better—and with acclamation thank Mr. Manuel for the able, courteous, and agreeable manner in which he has filled the chair as your President during the past year."

Mr. Archibald Thomson seconded the vote of thanks, endorsing the expressions of hope and assurance that, as a Past

President of the Institute, the good work accomplished during his year of office would be maintained and carried out by the valuable assistance of Mr. Manuel. The Council would be glad of his advice and experienced help; and in seconding the vote of thanks, he could do no less than foreshadow the future with a firm hope based upon the records of the past, that the Institute would grow and prosper in every way.

The Vote of thanks to Mr. Manuel, the retiring President, was carried with acclamation.

Mr. L. McKenzie proposed and Mr. Noble seconded a vote of thanks to the Vice-Presidents and Council, referring to the many hours which has been spent in the course of the year by the Vice-Presidents, Members of Council, and Office Bearers, on behalf of the Institute and its Membership; it was remarked that the records of the past session indicated the amount of vitality and energy with which the work had been carried on. The services of Mr. J. Macfarlane Gray as a Vice-President, and of Mr. W. W. Wilson as a Member of Council, were specially referred to.

The vote being cordially passed, was responded to by Mr. Gray, who expressed the pleasure he had felt in giving what help he could towards furthering the aims of those who had founded and established the Institute; and by Mr. Wilson, in the course of whose remarks mention was made of the benefits conferred by the Institute upon its Members, upon the whole community of Marine Engineers, and upon the nation, as being a Maritime Power, interested in the advancement of everything connected with Engineering progress. Mr. Wilson said that he had done the work entrusted to him as a Member of Council as well as he could, with pleasure, so indeed had each Member, and while on several had fallen a heavier share of the work than on others, each one had done what he could, and on behalf of the Council he thanked the Members for the vote of thanks.

The Chairman then read the notice of motion in respect to the alteration of by-laws relating to Membership, and called upon Mr. Wilson and Mr. Sage to bring the subject before the meeting.

After some considerable discussion as the wording of the by-law in its proposed amended form, Mr. Wilson moved and Mr. Sage seconded the resolution, which, on being put to the meeting, was carried, to the effect that in addition to the clause relating to Membership, as at present in force, as to First and

Second Engineers, that "all Engineers with first-class certificates, who have sailed with that certificate for twelve months, in a position qualifying for first-class certificate, shall be eligible as full Members."

The meeting then adjourned to the Reading Room, where coffee was served.

When the Members again assembled, Mr. G. Wiltshire was called upon to declare the results of the voting papers. These were reported as follows:—

President: Peter Denny, LL.D.
Honorary Secretary: Jas. Adamson.
Honorary Treasurer: Robt. Leslie.
Honorary Minute Secretary: J. R. Ruthven.

Members of Council:

L. P. Coubro
J. D. Churchill
A. C. Elliot, D. Sc
J. W. Richardson
F. W. Shorey
J. H. Thomson
W. W. Wilson
G. Wiltshire

In addition to the non-retiring Members, who are as follows:—

R. Adam
R. Bruce
C. Hudson
S. C. Sage
D. Greer

The Office Bearers and Council for the current session were then declared to be duly elected in accordance with the Articles of Association and By-laws.

On being called upon, Commander G. Hodgkinson, R.N. gave a forcible and practical address on the subject of suitable premises for the Institute and the carrying on of its operations, in the course of which he said that he felt proud of his election as an Honorary Member of an Institute which had made such progress in the brief space of two years. It was conducive to the progress of the country that the Institute should be upheld by those who were specially interested in the efficiency of Steamships. By means of such Institutes, under whose auspices technical subjects, bearing upon the practical working of machinery, were discussed by those who have charge of such valuable property,

the supremacy of the British Engineers would be maintained, and it was to the interest of all concerned that such should be encouraged by all means.

From what had been heard and experienced, it was manifest that better accommodation was required, to carry on the operations of the Institute, and enlarge the sphere of its labours.

In order to attain this end, money was necessary, and assuredly the funds required to erect and stock suitable premises would doubtless be forthcoming as soon as a plan could be formulated.

Commander Hodgkinson urged that to be successful and popular amongst those on whose behalf it was founded, the club element provided for in the Articles of Association should be kept prominent. The Building should not only be provided with a Hall for Meetings at which Papers should be read and discussed or Lectures given, but should contain Reading Room, Library accommodation, Experimental Rooms, Recreation and Smoking Rooms, so that members when in Port would have an established rendezvous to go to.

In closing he wished the Institute all success, and hoped soon to see the new Premises an accomplished fact, and as to the locality, the Building would require to be as central as possible to suit the various Docks, and near good Railway accommodation.

Mr. Churchill, as the Convener of the Premises Committee, made a few remarks relative to the difficulty which had been experienced in finding a suitable locality and premises which fulfilled the conditions, approximately near to the views of the Council so as to justify negotiations being carried on towards securing them. Such premises had been found, and a deposit paid, but the deposit was refunded, as the terms and conditions proposed by the vendor were not such as we could accept. In the meantime no other premises had been discovered of a suitable character in the neighbourhood of Stratford or Bow. If any of the Members knew of likely premises, the Committee would be glad to receive particulars.

He agreed with Commander Hodgkinson as to the desirability of having a Building in which all the accommodation he had referred to would be provided, also as to the Railway accommodation, and the situation being as central as possible.

The Honorary Secretary proposed that an application should be made to the Great Eastern Railway Company, with a view to the erection of suitable premises at Stratford Market Station, which was being re-built, and might with advantage be arranged as at Bow Station, where the Bow and Bromley Institute occupied premises.

The Chairman, Mr. F. W. Wymer, then addressed the Meeting as follows :—

I have been asked to say a few words to you on the objects of the Institute. I think I cannot do better than refer to the Memorandum of Association of the Institute for the text of my remarks, and in section 3, par. (*a*) of that memorandum, I find the following stated to be one of the Objects for which the Association is established—"To promote the Science and practice of Marine Engineering in all its branches."

Now this is a grand object for you as Members of this Institute to undertake, and it is one that I am sure will call forth all your energies as Marine Engineers; for the scope of Marine Engineering has been much enlarged of late years, in fact it is now almost impossible to limit its field of operations, embracing as it does such a variety of details in the construction and propulsion of vessels.

The second object of the Association, is stated in par. (*b*) of the above memorandum, to be as follows:—"To enable Marine Engineers to meet and to correspond, to faciliate the interchange of ideas respecting the improvements in, and original and improved methods of working machinery, and the publication and communication of information on such subjects."

To meet together is, I think, the best way of communicating and discussing the ideas that arise from time to time in the minds of those connected with the Institute, and of extending information on the several subjects among the Members.

Par. (*c*) of same memorandum states as follows:—"To maintain and improve the status of Marine Engineers and the profession of Marine Engineering, to afford facilities for education, study, and self-culture to Marine Engineers, and to promote their progressive advancement in knowledge of their profession."

This, as well as the first object of the Association, is of great importance, and far reaching in its effects, and leads me to say

that, as Members of this Institute, and with this object in view, we must do our utmost, by our example and by our ready and willing help to our junior brethren, to endeavour to raise them to a higher standard as Officers of the Mercantile Marine of this Country, so that they, after we have passed away, may by their advancement in knowledge and practice of their profession, be an honour to this Institute, and an advantage to the welfare of our nation at large.

With regard to the Institute Premises, COMMANDER HODGKINSON has already spoken on that subject.

MR. J. MACFARLANE GRAY referred to the objects and aims of the Institute in the following terms:—

To raise the standing of the Marine Engineer is the object for which this Society has been formed. The means by which the Institute will strive to attain this end will be principally, by working on the lines of that technical education, to which so much attention is at present being directed in every important section of mechanical industry. At the fortnightly meetings in London, and at the Branches, original papers will be read, dealing with every question relating to the duties of the Marine Engineer. These duties are now enormously extended beyond what they were when the first sea-going engineers were appointed, and every week in some steamer a new result is developed in a way not expected, and the Institute seeks to gather together these individual experiences for the instruction of all its members. When engineers keep themselves apart, the knowledge gained by each is like the trickling streaks of water on a mountain side, which, uncombined, would individually be lost, or spent in growing a mossy covering for some obstructing stone, from which the precious liquid would again evaporate into that heaven from which before it fell; but, when the threads of moisture, left by rain and dew in straggling rills, unite in streams and running brooks, they grow a river, wide and majestic, on which may float a nations commerce.

The Founders of this Institute have recognised the value of co-operation of minds engaged upon the same subjects—the trickling waters on the same mountain—and it is their ambition to form of these an important river of progress for Marine Engineering and the interests of Marine Engineers.

When the propelling engine and paddles, or screw, with the steam boiler, constituted the whole of the Engineer's charge, he thought himself well to the front, who, in addition to keeping his

engine in working order, understood lap and lead, could calculate horse-power from a diagram, and determine the proper weight for a safety valve. Now, however, with, in many steamers, more than a score of separate steam engines to look after, his duties have greatly extended, and every prudent engineer desires to know what his fellow engineers in other steamers have found to work best, and each desires to know more fully the why and the wherefore regarding every mechanical appliance committed to his care.

Papers by eminent specialists, who have kindly responded to our invitation to lecture before us, as well as the contributions of our practical sea-going members, are now issued; first as they have been read, to enable those members who were not present, to read the papers and discuss them with their colleagues in the mess-room, and then to send in their written remarks to be edited by the reading committee, and published three months after the reading. This arrangement will, it is believed, be largely taken advantage of and the discussions, by correspondence, will greatly add to the interest of the papers.

The part played by the reading committee will be principally to cut out the repetitions which would otherwise be unavoidable, since each one writing would be ignorant of what others had already written, as far as possible, remarks arriving in this way in duplicate will be credited to each of the writers.

In these correspondence discussions, perhaps the most important communications will be those in which a member states that he does not understand a certain part of a paper, or where he asks some question suggested to him while reading the paper. The required replies to these enquiries will be added, so far as the reader of the paper or the members of council can do so.

The Reading Room of the Institute is open every day for the use of the members, and the library, which is rapidly increasing in number of volumes, is already a valuable one. In this way the Institute has been working to raise the standing of Marine Engineers. The height of any man's standing is just the level of his understanding. The word "understanding" tells us this, when we add to our knowledge any set of facts, we have supplied material to our soul for house building; if these are put away as lumber, even in a memory store, we stand just as before, but if the logs of fact are sawn up and separated into planks, and laid out, levelled, and jointed, side by side in the mind, we then *understand* these facts, and by so much have we extended that platform which is the only promenade of our soul—its only place of recreation. It is by that process of plank-

laying or understanding of facts that this Institute seeks to improve the standing of Marine Engineers. The shoemaker at his work occupies the same seat year after year, and so it is with many engineers, in their mind they have rigged up a shoemaker's stool for their soul; and they have never thought it worth while to form for it a deck of understanding any broader than the stool of their trade, just large enough to permit them to do the work for which they are paid. They say, "If I get a larger stool, or if I work on a floor of greater area I may make no more shoes than I do now, and my wages will be no higher." But, thou fool, thy wages is just the enjoyment which you procure for yourself, and accustomed as you have been to barely elbow-room, you are unable to appreciate the joy of freedom, but, believe those who have experienced it, try it, and you will then prize it more than anything you now possess. "Man liveth not by bread alone, but by every word that proceedeth out of the mouth of God."

This Institute aims also at leading its members to listen more attentively to catch those other words which the Almighty is speaking continually to them, whispered in still small voices from every moving part of the engine; from the mysterious flame of the furnace, as sacred to-day when used to raise steam, as ever it was when it ascended of yore from altar of sacrifice; from the myriads of rotating rollers in every film of lubricant; from the bombardment of hailstones by which every steam piston is propelled, from the wonderful curling waves of the ocean, the particles of which, even when apparently at rest, are really dancing together all the time, with measured steps of minute length and marvellous rapidity, the mean velocity of which exceeds a hundred times that of the swiftest steamer that ever tracked its path upon them. If all this, aye, and a thousand times more, is to be seen by any soul that has a decked understanding upon which it can take exercise, which of you will be content to limit the furniture of your mind to a shoemaker's stool, and only room enough for the soul to stick to its last?

Do not say that this is all poetry and imagination; what I am telling you is only the sober truth, and the object for which we are in the world is that we may see these *ferlies* and be filled with the emotion that their existence is calculated to excite in us, for the "Father seeketh such to worship him."

This emotion, this gratification of the soul, is what anyone can count on, as being the certain reward of every one who will enter upon the work of raising in himself, the standing of the Marine Engineer. Wisdom says "I honour them that honour me." They who seek after knowledge as for hidden treasures honour wisdom;

and very often the knowledge on which alone they set the heart in the search becomes, when found, a real treasure of money-worth in their hands. The treasure comes then as a glad surprise. Be all of you assured that he who does his work well, for the pleasure he finds in it, is more likely to have also money reward than he is who labours as a hireling only, taking no pleasure in his work, disappointment must often be the lot of him who labours merely for position and wages; but he who seeks after knowledge as hard as his neighbour seeks after hidden treasure, is being rewarded, all the time that the other is working for nothing. The object of this Institute is to cultivate in the minds of its members, the task and habit of searching after knowledge as for hidden treasure.

I have used the words "raising the standing of Marine Engineers," and some of you will be now disappointed, saying that I keep the word of promise to the ear and break it to the hope. Then to the hope I also say that the plan described is that which will best attain the object—higher consideration for Marine Engineers as a class. In our merchant steamers the importance of the engineer is rapidly increasing, while the duties of the navigating officers, with the gradual abandonment of masts and sails are becoming relatively less important. If engineers will aim at so conducting themselves that they are never spoken of otherwise than as being "quite equal if not superior to the deck officers in their language and behaviour," and if in all that pertains to their highly intellectual calling they make themselves masters both of the theory and the practice, the time would not be very distant when their importance in steamers would be fully recognised. The man who is the Engineer in charge over cranes, capstans, refrigerators, ventilators, distillers, dynamos, pumps, steering engines, propelling engines, fuel, boilers, and propeller in a steamer "whose masts are flagstaffs only," cannot long be regarded as other than one to whom both the utmost respect and confidence are due.

Mr. L. P. Coubro reported that arrangements were being made to receive the inaugural address from the new President, Peter Denny, LL.D., at a dinner to be given in his honour during the month of May, and from his letter on the subject to the Honorary Secretary the date would be probably the 20th May.

Mr. Archibald Thomson gave a few remarks on the subject of local centres, advocating the view that, to embrace the whole membership and give as nearly as possible the same facilities for the interchange of thoughts and experiences to Members resident at different ports, the establishment of local centres should be encouraged, and conducted on a sound basis and amenable to the

central body; these should prove a source of strength to the Institute as a whole.

The central Council could, and should legislate for the whole; each centre might be represented on the Council, while each centre, should carry on its own work locally.

The same Papers could be read and discussed, and the whole published by the General Council.

Mr. Thomson considered that a scheme for extending the Institute by means of local effort at the various ports would prove of great benefit. He mentioned Liverpool and Glasgow as ports where, by the co-operation of Marine Engineers resident or trading there, the operations which had been carried on so successfully in London might be extended to various parts of the Kingdom with the same beneficial results to all concerned.

It was remarked that a Local Centre had been already, so far established at Cardiff, and promised to be a most flourishing branch. The Office Bearers who were nominated by the Bristol Channel Members had been elected by ballot, and the result was declared as follows:—

A. C. Elliot, D. Sc., *Local Chairman.*
David Gibson, *Local Vice-Chairman.*
Wm. W. F. Pullen, *Honorary Local Secretary.*
Edmund John, *Representative to Council.*
G. E. Fownes, *Member of Local Committee.*
Jas. Ferrier, „ „
W. H. Eastwood, „ „

The Chairman having announced the Business concluded, a vote of thanks was proposed, seconded and carried with acclamation, to Mr. Wymer, for presiding.

April 18th, 1891.

At a Meeting of Council held subsequent to the Annual Meeting, the undernoted appointments were made in terms of the By-Laws bearing on the subject, also those made in addition to the elections declared at the Annual Meeting.

President:

PETER DENNY, LL.D.

Past Presidents:

MR. ASPLAN BELDAM AND MR. G. W. MANUEL.

Honorary Secretary:

MR. JAS. ADAMSON.

Honorary Treasurer:

MR. ROBT. LESLIE.

Vice-Presidents:

MR. ROBERT ADAM
,, D. BRAND
,, WALTER BROCK
,, W. J. CRAIG
,, C. A. CROOK
,, P. DENNY, JUNR
,, A. C. ELLIOTT *D. Sc.*
,, T. W. FISH
,, J. M. GRAY
,, P. HALL
,, G. W. KIDD
,, H. PRIOR
MR. H. M. RAIT
,, W. C. ROBERTS
,, A. W. ROBERTSON
,, JAS. STEWART
,, JOHN STEWART
,, J. TAIT
,, A. THOMSON
,, J. H. THOMSON
,, J. WEIR
,, WM. W. WILSON
,, G. E. WILKINSON
,, F. W. WYMER

Council:

MR. JAS. BLELLOCH
,, J. D. CHURCHILL
,, L. P. COUBRO
,, D. GREER
,, C. HUDSON
,, E. JOHN
MR. C. G. NEWBY
,, J. W. RICHARDSON
,, S. C. SAGE
,, F. W. SHOREY
,, J. H. THOMSON
,, W. WHITE

MR. G. WILTSHIRE.

Honorary Minute Secretary:

MR. J. R. RUTHVEN.

Conveners of Committees:

MR. JAS. BLELLOCH, *Press Notices*
,, L. P. COUBRO, *Discussions*
,, J. D. CHURCHILL, *Premises*
,, C. G. NEWBY, *Transactions*
MR. J. W. RICHARDSON, *Recreation*
,, F. W. SHOREY, *Reading Room*
,, J. H. THOMSON, *Property*
,, W. WHITE, *Library*

MR. G. WILTSHIRE, *Extension Committee.*

INSTITUTE OF

SESSION

ANNUAL BALANCE SHEET,

Receipts.	£ s. d.	£ s. d.
Balance from last year		196 11 4
To Entrance Fees:—		
Members	117 0 0	
Associate Members	17 5 0	
Associates	9 15 0	
Graduates	1 0 0	
		145 0 0
„ Annual Subscriptions:—		
Members	238 10 0	
Associate Members	14 5 0	
Associates	9 0 0	
Graduates	1 5 0	
Omission, February, 1890	3 1 0	
		266 1 0
„ Donations, Honorary Members		37 17 0
„ Ditto Library and Reading Room Fund ..		10 8 6
„ Ditto Building Fund		156 10 0
„ Sale of Copies of Papers and Discussions ..		0 10 0
„ Sale of Copies of By-laws		5 16 0
„ Ditto Tickets, *re* Conversazione		51 15 9
„ Ditto Copies of Shipping World		0 19 6
„ Binding, &c., of 69 Volumes, at 3s. 6d., as per statement from Convener		23 2 0
		£894 11 1

We have examined the foregoing Accounts, and compared

MARINE ENGINEERS.

1890-1891.

YEAR ENDING 31st JANUARY, 1891.

Expenditure.

	£	s.	d.
By Expenses—General Account	99	18	11½
„ do. Papers and Discussions Account	242	1	1½
„ do Library and Reading Room Account ..	54	16	4
„ Recreation Account including Conversazione ..	58	6	1
„ By-Laws and Legal Expenses Account	24	8	3
Balance	415	0	4
	£894	11	1

them with the Vouchers, and find the same to be correct.

JOHN A. ROWE, }
GEO. W. KIDD, } *Auditors.*

ROBT. LESLIE, *Hon. Treasurer.*

INSTITUTE OF MARINE ENGINEERS.

LIBRARY CATALOGUE.

No.	Description.	Presented by
1	Useful Information for Engineers (Fairbairn) ..	J. M. Gray
2	do. do. 2nd series	do.
3	do. do. 3rd series	do.
4	The Steam Engine (Bourne)	do.
5	Voltaic Electricity (Tyndall)	do.
6	Link and Valve Motions (Auchinclass)	do.
7	Once a Week, vol. 1 ..	do.
8	do. vol. 2 ..	do.
9	do. vol. 3 ..	do.
10	do. vol. 4 ..	do.
11	do. vol. 5 ..	do.
12	do. vol. 6 ..	do.
13	do. vol. 7 ..	do.
14	do. vol. 8 ..	do
15	do. vol. 9 ..	do.
16	do. vol. 10 ..	do.
17	do. vol. 11 ..	do.
18	do. vol. 12 ..	do.
19	do. vol. 13 ..	do.
20	Marine Engines and Boilers, vol. 1	R. Leslie
21	do. vol. 2	do.
22	Malit's Construction of Artillery	J. M. Gray
23	Encyclopædia (Beeton's) vol. 1	D. Greer
24	do. vol. 2	do.
25	do. vol. 3	do.
26	do. vol. 4	do.
27	March of the Strikers (J. Bevan)	A. Campbell
28	Madame Midas (Fergus Hume)	do.

No.	Description.	Presented by
29	Taken from Life (Henry Pettitt)	A. Campbell
30	The Crime of the Opera House	do.
31	Zeph (G. R. Sims)	do.
32	Without a Home (E. P. Roe)	do.
33	Coral Pin	do.
34	Zoroaster (F. M. Crawford)..	do.
35	Souls and Cities	do.
36	Two Years Ago (Charles Kingsley)	do.
37	Notes on Lilies (Dr. Wallace)	do.
38	Crime and Punishment ..	do.
39	India Re-visited (Edwin Arnold)	R. Leslie
40	All the Year Round, vol. 1..	J. M. Gray
41	do. vol. 2..	do.
42	do. vol. 3..	do.
43	do. vol. 4..	do.
44	do. vol. 5..	do.
45	do. vol. 6..	do.
46	do. vol. 7..	do.
47	do. vol. 8..	do.
48	do. vol. 9..	do.
49	do. vol. 10..	do.
50	do. vol. 11..	do.
51	do. vol. 12..	do.
52	do. vol. 13..	do.
53	do. vol. 14..	do.
54	do. vol. 15..	do.
55	do. vol. 16..	do.
56	do. vol. 17..	do.
57	do. vol. 18..	do.
58	Good Words, 1860	do.
59	do. 1861	do.
60	do. 1862	do.
60a	do. 1864	do.
60b	do. 1865	do.
60c	do. 1866	do.
61	Electricity (John T. Sprague)	H. Chisholm

No.	Description.	Presented by
62	Elementary Engineering (J. Sherran Brewer) ..	A. W. Robertson
63	Machine Drawing and Design (Ripper)	do.
64	Hydraulic Motors (G. R. Bodmer)	J. Lockie
65	Engineering Socially Considered (Haldane)	H. Hammett
66	Steam Boilers (R. D. Munro)	M. C. McKellar
67	The Steam Engine (W. H. Northcott)	The Author
68	Geometric Turning Simplified (W. H. Northcott) ..	do.
69	On Lathes and Turning do.	do.
69a	Examples on Lathes and Turning (W. H. Northcott)	do.
70	Into all the World (John Scarth)	do.
71	The Life of William Denny (A. B. Bruce)	P. M. Black
72	Webster's Dictionary ..	Purchased
73	S.S. House Flags	do.
74	A Text Book on Steam and Steam Engines (Professor Jamieson)	M. C. McKellar
75	The Engineer's Sketch Book (T. W. Barber)	do.
76	Mine Engineering Plates (G. C. Greenwell)	A. McMurchy
77	Ditto do. ..	do.
78	Haddon Hall	Capt. Angove
79	Only a Butterfly	do.
80	Deux Parisiennes	do.
81	Adventures of a Phæton (Wm. Black)	do.
82	Leyton Hall (Mark Lemon) ..	do
83	Barren Honour	do
84	Under which King (William Johnston, M.P.)	do.
85	Against Wind and Tide (Holme Lee)	do.

No.	Description.	Presented by
86	Roba Di Roma (W.W. Story)	Capt. Angove
87	Devereux (Lord Lytton) ..	do.
88	Fortunes of Nigel (Sir W. Scott)	do.
89	Tales of Three Cities (Henry James)	do.
90	Dumbleton Common (Hon. E. Eden)	do.
91	Hostages to Fortune(Braddon)	do.
92	Frank Sinclair's Wife, vol. 2 (Mrs. Riddell)	D. Gillespie
93	Mandolinette	Capt. Angove
94	Prosper Randoce (Victor Cherbuliez)	do
95	Mary Gresley (Anthony Trollope)	do.
96	Willing to Die (J. S. Le Fanu)	do.
97	In Pastures Green (Gibbon)..	do.
98	The Cure of Souls (Cobban)	D. Gillespie
99	At Her Mercy (Jas. Payne ..	do.
99A	The Woman in Red(Hayward)	do.
100	The Tropical Agriculturalist, 1881-2	do.
101	La Morte (Octave Feuillet) ..	Capt. Angove
102	Ready-Money Mortiboy (W. Besant and J. Rice) ..	do.
103	Henrietta Temple (Earl of Beaconsfield)	do.
104	Cronow's Recollections ..	do.
105	Dick's Wandering (Julian Sturgis)	do.
106	London : Its celebrated characters, &c.	do.
107	La San-Felice	do.
108	Two Duchesses (F. P. Clark)	do.
109	The Girls of Feversham (Florence Marryat) ..	do.
110	Joan (Rhoda Broughton) ..	do.
111	Laurence Sterne, vol. 2 (P. Fitzgerald)	do.

No.	Description.	Presented by
112	White Chief (Capt. Mayne Reid)	Capt. Angove
113	Bella Donna (Gilbert Dyce)	do.
114	Les Drames de la Forêt (Alexis Bouvier)	do.
115	The Disowned (Lord Lytton)	do.
116	Blount Tempest (Rev. J. C. M. Bellew)	do.
117	Austin Elliot	do.
118	Condoned (Ann C. Steele) ..	do.
119	The Six Chief Lives—Poets (M. Arnold)	do.
120	L'Uscoque (Geo. Sand) ..	do.
121	The Gun, Ram, and Torpedo (G. H. Noal)	do.
122	Ravenshoe (H. Kingsley) ..	do.
123	How he won Her (Mrs. Eiloart)	do.
124	The Contemporary Review (January-June, 1882) ..	do.
125	The Fortnightly Review (1882)	do.
126	Island Life (A. R. Wallace)	do.
127	Spon's Dictionary of Engineering Div. 1	Purchased
128	do. do. Div. 2	do.
129	do. do. Div. 3	do.
130	do. do. Div. 4	do.
131	do. do. Div. 5	do.
132	do do. Div. 6	do.
133	do. do. Div. 7	do.
134	do do. Div. 8	do.
135	Burgh's Pocket Book on Compound Engines	J. H. Thomson
136	The Steam Engine, vol. 1 (D. K. Clark)	A. W. Robertson
137	do. vol. 2	do.
137a	do. vol. 3	do.
137b	do. vol. 4	do.
138	The Marine Engineer— vol. 1, 1879-80	J. W. Richardson

No.	Description.	Presented by
139	The Marine Engineer— vol. 2, 1880-81	J. W. Richardson
140	do. vol. 3, 1881-82	do.
141	do. vol. 4, 1882-83	do
142	do. vol. 5, 1883-84	do.
143	do. vol. 6, 1884-85	do.
144	do. vol. 7, 1885-86	do.
145	do. vol. 8, 1886-87	do.
146	do. vol. 9, 1887-88	do.
147	do. vol. 10, 1888-89	do.
148	Marine Engineering News, 1876	do.
149	do. 1877..	do.
150	do. 1878..	do.
151	The Foreman Engineer, 1877	do.
152	do. 1879	do.
153	do. 1880	do.
154	Handbook for Steam Users (M. P. Bale)	The Author
155	Marine Engines and Boilers (Geo. C. V. Holmes) ..	A. Lawrie
156	Theory of Heat (Maxwell) ..	J. H. Thomson
157	Conversion of Heat into Work (Anderson)	A. Lawrie
158	Heat a Mode of Motion (Tyndall)	do.
159	A Practical Treatise on Heat (Box)	do.
160	The Engineer's and Machinist's Drawing Book	H. Prior
161	Imperial Cyclopædia of Machinery	do.
162	Iron Ship Building (J. Grantham)	Jas. Adamson
163	The Shipping World, 1890 ..	Purchased
164	Shipbuilding—plates ..	Jas. Adamson
165	The Graphic, vol. 2, 1889 ..	Purchased
166	Illustrated London News, vol. 2, 1889	do.

No.	Description.	Presented by
167	Year Book of Scientific Societies—1890	Purchased
168	Ditto 1891	do.
169	Hydro-Statics & Pneumatics (Magnus)	J. Taylor
170	Elementary Mechanics (Magnus)	do.
171	Naval Architecture (Thearle), Text	do.
172	Naval Architecture (Thearle), Plates	do.
173	Engineering, 1877	Jas. Stewart
174	do. 1877	do.
175	do. 1878	do.
176	do. 1878	do.
177	The Marine Transport of Petroleum (Little) ..	The Author
178	Shakespeare, vol. 1, Comedies	Robert Adam
179	do. vol. 2, Tragedies	do.
180	do. vol. 3, Histories	do.
181*	From Keel to Truck ..	Purchased
182	Mechanical Graphics (G. Halliday)	James Phillips
183	Strength of Materials and Structures (J. Anderson) ..	Henry Prior
184	Steam and its Uses (D. Lardner)	do.
185	Electricity (Ferguson) ..	do.
186	Millwright and Engineers' Companion (Templeton) ..	do.
187	Service Chemistry (V. B. Lewes)	C. A. Crook
188	Bell's System of Geography..	J. W. Richardson
189	do. ..	do.
190	do. ..	do.
191	do. ..	do.
192	do. ..	do.
193	do. ..	do.
194	Engineering, July to Dec., 1884	R. W. Kingswood
195	Scientific American	E. H. Minns
196	do. ..	do.

* Bristol Channel Centre.

No.	Description.	Presented by
197	Scientific American	E. H. Minns
198	do. ..	do.
199	do. ..	do.
200	do. ..	do.
201	do. ..	do.
202	do. ..	do.
203	do. ..	do.
204	do. ..	do.
205	Chairman's Handbook (Palgrave)	C. Noble
206	Electricity and Magnetism (Dunman)	do.
207	The Effects of Liquids on Iron (Phillips)	The Author
208	The Relative Corrosion of Iron and Steel (Phillips) ..	do.
209	The Steamship, vol. 1, 1889-90	The Editor
210	Once a Week, vol. 4, 1867 ..	J. M. Gray
211	Harold, the Last of the Saxon Kings	Captain Angove
212	Lizzie Lorton of Greyrigg ..	do.
213	Electrical Dictionary (Houston)	P. Macphail
214	Great Industries of Great Britain vol. 1 ..	J. W. Smith
215	do. vol. 2 ..	do.
216	do. vol. 3 ..	do.
217	Institution of Mechanical Engineers Transactions, 1887	C. A. Crook
218	do. 1888 ..	do.
219	do. 1889 ..	do.
220	Handbook of Engine and Boiler Trials (Thurston) ..	W. Hossack
221	Handbook on Direct Acting Pumping Engines	T. Drewry
222	Lectures on Electricity (Forbes)	do.
223	The Steam Engine Indicator &c. (Beamont)	do.
224	From Keel to Truck	A. Black
225	Marine Encyclopædia ..	C. E. Hudson

No.	Description.	Presented by
226	Weale's Quarterly Papers on Engineering, part 1. . .	H. W. Holman
227	do. part 2. . .	do.
228	do. part 3. . .	do.
229	do. part 4. . .	do.
230	do. part 5. . .	do.
231	do. part 6. . .	do.
232	do. part 7. . .	do.
233	do. part 8. . .	do
234	do. part 9. . .	do.
235	do. part 12. . .	do.
236	Sound, Light, and Heat (Wright)	John Whyte
237	Kitty Trevylyan	do.
238	The Steam Engine (Cotterill)	Purchased
239	English Magazine	J. Y. Lowe
240	Scribner's do.	do.
241	do. do.	do.
242	Electrical Engineering (Slingo and Brooker) . . .	
243	Engineering vol. 14, 1862	J. W. Bryden
244	do. vol. 15, 1863	do.
245*	Transactions of I. Mar. E., vol. 1,	The Council
246*	Illustrated Marine Encylopædia	Purchased
247	Solutions to Engineers' First-class Questions (E. J. M. Davies)	Purchased
248	Treatise on Future Naval Battles (Admiral Elliot) . .	M. W. Ruthven
249	The Scottish Nation vol. 1 . .	P. Boyd
250	do. vol. 2 . .	do.
251	do. vol. 3 . .	do.
252	do. vol. 4 . .	do.
253	do. vol 5 . .	do.
254	do. vol. 6 . .	do.
255	do. vol. 7 . .	do.
256	do. vol. 8 . .	do.
257	do. vol. 9 . .	do.
258	Dynamo-Electric Machinery (S. P. Thompson)	M. C. Storrar

* Bristol Channel Centre.

LIST OF MAGAZINES AND PAPERS.

READING ROOM TABLE.

No.	Description.	Presented by
	The Graphic	Purchased
	The Illustrated London News	do.
	The Marine Engineer ..	do.
	The Steamship	do.
	Industries	do.
	The Shipping World ..	do.
	Shipping World Year Book	do.
	The Bailie	A Subscriber
	Pen and Pencil	do.
	The Iron and Coal Trades Review	The Editor
	The Practical Engineer ..	R. Leslie
	The Mechanical World ..	A. Daniels
	The Engineer	L. P. Coubro
	Engineering	do.
	Iron	Various
	Fairplay	do.
	Newspapers	do.
	Transactions (Institute Engineers and Shipbuilders, Scotland)	Per favour of the Secretary
	Pamphlets & Papers (various)	Various
	Hazell's Annual, 1891 ..	Purchased
	Whitaker's Almanack, 1891	J. H. Thomson

THE MALCOLM

BALANCE

Receipts.

	£ s. d.	£ s. d.
Amounts previously acknowledged, March, 1890		43 15 0
Per Mrs. M. Campbell	5 5 0	
„ J. Newton	2 0 0	
		7 5 0
		£51 0 0

We have examined the foregoing Accounts, compared

CAMPBELL MEMORIAL.

SHEET.

Expenditure.

	£ s. d.	£ s. d.
Amounts previously detailed, March, 1890		44 4 10
By Postages, &c.	0 4 6	
„ Seager's Account	5 13 1	
„ Balance	0 17 7	
		6 15 2
		£51 0 0

them with the Vouchers, and find the same to be correct.

C. G. NEWBY,
J. G. HAWTHORN, } *Auditors.*

JAS. ADAMSON,

Hon. Treasurer.

MALCOLM CAMPBELL MEMORIAL.

LIBRARY CATALOGUE.

LOAN COLLECTION.

No.	Description.	Lent by
1	Boilers (deterioration of) ..	Jas. Adamson
2	do. do Report ..	do.
3	Marine Engines, Modern American	J. H. Thomson
4	Marine Architecture (Charnock) .. .. vol. 1	J. Adamson
5	do. do. vol. 2	do.
6	do. do. vol. 3	do.
7	Shipbuilding (A. F. B. Craize)	do.
8	Naval Architecture (D. Steel)	do.
9	Screw Propeller (J. Bourne, C.E.)	J. H. Thomson
10	Mercantile Navy List ..	Jas. Adamson
11	Society of Engineers, Transactions .. 1876	do.
12	do. do. 1879	do.
13	do. do. 1880	do.
14	do. do. 1881	do.
15	do. do. 1882	do.
16	do. do. 1883	do.
17	Mechanics Magazine (Glasgow) vol. 2	do.
18	do. do. vol. 3	do.
19	do. do. vol. 4	do.
20	do. do. vol. 5	do.
21	Pattern Making (Foreman Pattern Maker)	Campbell Trustees

No.	Description.	Lent by
22	Civil Engineers (proceedings), vol. 87	Jas. Adamson
23	Dictionary of Arts, &c. (Dr. Ure's), vol. 1	J. H. Thomson
24	do. do. vol. 2	do.
25	do. do. vol. 3	do.
26	do. do. vol. 4	do.
27	Microscopic Objects (Davies)	Jas. Adamson
28	Steam Engine (J. Bourne, C.E.)	do.
29	Engineering, vol. 1 } 1869	do.
30	do. vol. 2 }	
31	do. vol. 1 } 1870	do.
32	do. vol. 2 }	
33	do. vol. 1 } 1871	do.
34	do. vol. 2 }	
35	do. vol. 1 } 1872	do.
36	do. vol. 2 }	
37	do. vol. 1 } 1873	do.
38	do. vol. 2 }	
39	Dictionary of Engineering, (Spons') vol. 1	A. Beldam
40	do. do. vol. 2	do.
41	do do. vol. 3	do.
42	Carpenter's Guide (Nicholson)	Jas. Adamson
43	Engineer, Surveyor, and Architect	do
44	Steam Boilers (Peattie) ..	do.
45	Strength of Materials (T. Box)	Campbell Trustees
46	Physics (Gunots')	do.
47	Applied Mechanics (Rankine)	do.
48	Steam Engine do. ..	do.
49	Rules and Tables do. ..	do.
50	Lives of the Engineers, vol. 1 (Smiles)	do.
51	do. vol. 2 do.	do.
52	do. vol. 3 do.	do.
53	do. vol. 4 do.	do.
54	do. vol. 5 do.	do.
55	Practical Engineer (Hutton) ..	do.

No.	Description.	Lent by
56	Works Manager (Hutton) ..	Campbell Trustees
57	Marine Steam Engine (Sennett)	do.
58	Marine Engineering (Seaton)	do.
59	Valve Gears (Zeuner) ..	do.
60	Hydraulic, Steam and Hand Power	do.
61	Modern Steam Practice (Winton) vol. 1	do.
62	do. do. vol. 2	do.
63	Shipbuilding (Rankine) ..	do.
64	Engineers' Drawing (Le Blanc)	do.
65	Nautical Magazine, 1836 ..	Jas. Adamson
66	do. 1837 ..	do.
67	do. 1838 ..	do.
68	do. 1839 ..	do.
69	do. 1840 ..	do.
70	do. 1841 ..	do.
71	do. 1842 ..	do.
72	do. 1843 ..	do.
73	do. 1844 ..	do.
74	do. 1845 ..	do.
75	do. 1846 ..	do.
76	do. 1847 ..	do.
77	do. 1848 ..	do.
78	do. 1849 ..	do.
79	do. 1850 ..	do.
80	do. 1851 ..	do.
81	do. 1852 ..	do.
82	do. 1853 ..	do.
83	do. 1854 ..	do.
84	do. 1855 ..	do.
85	do. 1856 ..	do.
86	do. 1857 ..	do.
87	do. 1858 ..	do.
88	do. 1859 ..	do.
89	Boilers, Construction of (Traill)	Campbell Trustees
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117	do. vol. 2 ..	do.
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128	do. vol. 19) 1875..	do.
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130	do. vol. 21) 1876..	do.
131	do vol. 22)	
132	do. vol. 23) 1877..	do.
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147	do vol. 38)	
148	do. vol. 39) 1885..	do.
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150	Inst. of Engineers and Shipbuilders in Scotland Transactions	Jas. Adamson
151	Steam and the Steam Engine (Evers)	do.
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170	Cassell's Saturday Journal, 1883—4	do.
171	do. do. 1884—5	do.
172	Family Herald, vol. 42—43	do.
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175	Engineers' Magazine, vol. 2	Jas. Adamson
176	Rules and Regulations Lloyds' Register	do.
177*	The Steamship, 1889—90, vol. 1	The Council Inst. Mar. Engineers
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THE LANGTHORNE ROOMS,
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1*st April*, 1890.

PREFACE.

A Meeting of the Institute was held this evening, when the discussion on Friction was resumed from Tuesday, 4th March, on which date Mr. W. J. Nowers Brett (Associate) read a Paper on the subject of "Friction of Screw Propelling Engines."

By request, Mr. Brett prepared a supplementary paper based on the experiments referred to by Mr. McFarlane Gray, in connection with the Institution of Mechanical Engineers, to whose transactions we are indebted for the data and the sketch of the apparatus used in the experiments, and by the kind courtesy of the Council we reproduce the latter.

Mr. L. P. Coubro presided on both evenings. The Paper and Discussions will be found in the pages which follow.

The paper itself is of special interest, as being the first presented to the Institute by an Associate; it is hoped that others of the Juniors will follow suit, as to them this Paper is specially commended.

The personal advantage gained by committing thoughts to paper is considerable, both as a test of knowledge and an incentive to mental effort; the public advantage gained is also considerable, as by the interchange of ideas, improvements are brought about which everyone who has the public weal at heart cannot but look upon with satisfaction.

It is well to aim at self-improvement, and to assist also in forwarding the advancement of the community at large in whatever is true and good, whether scientific or moral.

It was considered desirable that as the subject of Friction is of such a wide character, it would be of considerable profit and conducive to a more valuable discussion if a series of practical papers were given, each one embracing a definite portion of the Engine, as the Friction on Crank Pins, with the best proportions of surface in length and diameter, the varieties of metals in use for the *Brasses*, with co-efficients of Friction, best system of lubrication, most effective style of oil-ways, &c. It was also suggested that a Paper on Church's Equilibrium Slide Valve might be read in the course of the session. The Patentee has been communicated with regarding this.

JAS. ADAMSON,
Honorary Secretary.