

SESSION



1917-18.

President: CAPTAIN RICHARD H. GREEN, R.D.C.

Minutes of Proceedings

OF THE

Annual Meeting

*HELD IN THE PREMISES OF THE INSTITUTE
ON FRIDAY, APRIL 5th, 1918, AT 6 p.m.*

CHAIRMAN: THE PRESIDENT.

CHAIRMAN: It is my duty to preside at this Twenty-ninth Annual Meeting of the Institute. You have all got a copy of the Annual Report, and I am quite sure, in reading through it, you will be gratified and pleased to see how well the work of the Institute has been carried on throughout this past difficult year, notwithstanding the fact that marine engineers, probably more than most people, have been immersed in the war and in war work. I think one of the most gratifying features of the report is not only the maintenance of your membership, but the increase in membership, which shows that, in spite of the strain and work involved by the war, the knowledge of the Institute is alive amongst the ranks of engineers, and members are coming forward to join. I have not gone into the classification of members, but the main fact remains that the *corpus* of the Institute has increased by 70. Throughout the year the Institute has maintained its list of sessions and papers read. It has been a very determined feature of the

executive that that part of the work should not at any cost suffer, and, therefore, the Institute has been kept alive in the current work of engineering by the continual reading of papers, which is, I think, a very satisfactory thing. It shows that the interest has been sufficient, despite the demands upon our time, that members are willing to prepare and read papers and others to come forward to the meetings and enter into the discussions. There is always a sad feature in an Institute of this kind, and, indeed, in any body of men—that is, the obituary notices of men who have passed away during the year. Among these is the name of one who was known to us all, and whom I always ranked as a personal friend—that is, Mr. Peter Campbell. I knew Mr. Campbell from the time he first came ashore to undertake a superintendent's duties, and we were in very close business association during the whole of that time until he went abroad. I was sorry I was not in the office the last time he called, practically on the day he died. As a practical engineer he had very few superiors; as a business man I have rarely met his equal in dealing with matters from the commercial point of view, or one with his honesty of purpose and honesty of dealing. I speak as a contractor under him, and, as a contractor, one who never had the least hesitation in accepting Mr. Campbell's verdict on anything put before him. I was always content to leave myself entirely in his hands, because I knew I was dealing with a man of honesty and purity of spirit. I treasure it as a great privilege and pleasure to have been associated with him so long. I cannot help paying this tribute, as a friend and as one who was more than usually acquainted with him than is the lot of two men who held our relative positions. I do not think there is anything else I can comment upon. The report speaks for itself.

Mr. J. R. RUTHVEN: I have pleasure in proposing that Messrs. W. E. Farenden and R. J. McLeod act as Scrutineers.

Mr. J. PATERSON seconded the motion, which was duly carried.

The HON. SECRETARY then read the Annual Report as follows:—

Annual Report.

It is satisfactory to be in a position to report progress in connection with the general work of the Institute in spite of the disadvantages which have militated against advancement.

The monthly issues of Transactions have been continued regularly. The cost of paper and of printing has increased considerably during the past year, but it was deemed more advisable to continue the issues monthly for the benefit of the members generally than to reduce the printing account. The Advertisement Section has yielded a better return financially since it has been dealt with direct from the Institute. It also gives promise of becoming a means of meeting the expenses involved in the printing of the Transactions.

Several members and friends from overseas have paid visits to the premises during the year, and many on our Membership Roll who had previously been unable to inspect the building have done so. It is worthy of note that advantage has been taken of the accommodation regularly by members, who find it convenient.

The use of the basement was granted to the City of London Volunteers as Headquarters for the 6th Battalion, and has been occupied since last Whitsun. The Library and Lecture Hall have also been utilised for lectures in connection with the National Service.

Portraits and biographical sketches of those of our membership roll who have lost their lives owing to the War have appeared in the Transactions, and a framed record of the names is being prepared to be placed in the premises.

The Membership Roll on January, 1918, amounted to the following:—

MEMBERSHIP.	Jan. 31, 1917.	Transfers from | to	Elected.	Died.	Re- signed.	Lapsed.	Jan. 31, 1918.*
Past Presidents (Non-Members), Hon. Vice-Presidents and Hon. Members	13	—	1	2	—	—	12
Members	1,496	— 3	70 *11	15	3	10	1,451 11
Associate Members	75	3 7	16 *2	—	—	—	95 2
Associates	51	3 —	4	1	—	1	50
Graduates	59	4 —	2 *4	2	—	1	54 4
Companions	80	— —	2	2	1	2	77
Totals	1,684	10 10	112	22	4	14	1,756

* Including applications received in January and subsequently elected.

The net increase during the year is thus 70. The foregoing tabulated list shows the changes which have occurred in each grade of membership. Many of those who are designated as lapsed will probably become reinstated, having got out of touch due to removal or transfer from their registered addresses.

PAPERS AND TRANSACTIONS.—Meetings have been held monthly, and seven papers have been read during the Session on the undermentioned subjects and dates:—

LIST OF PAPERS READ.

DATE.	SUBJECT.	AUTHOR.	CHAIRMAN.
1917.			
Feb. 6th..	Marine Salvage Operations..	ROBT. WRIGHT ..	H. A. RUCK-KEENE.
Mar. 6th..	Cast Iron	A MEMBER	J. T. MILTON.
April 10th..	Standardisation of Marine Engines	W. VEYSEY LANG .. (Member)	J. SHANKS.
May 1st..	Brass and other Copper Alloys used in Marine Engineering	J. T. MILTON .. (Vice-President)	ALEX. BOYLE.
Sept. 11th..	Water-tight Doors	IGNACIO TORO .. (Engr.-Lieut. C.N.) (Member)	ROBT. BALFOUR.
Nov. 13th..	Aids to Prevent a Ship from Sinking	CHAS. V. A. ELEY .. (Member)	B. P. FIELDEN.
Dec. 18th..	Corrosion in Marine Boilers. Its Causes and Prevention	D. E. REES (Member)	B. P. FIELDEN.
1918.			
Jan. 15th..	Presidential Address.. ..		The PRESIDENT.

LIBRARY AND READING ROOM.—Twenty volumes have been presented by members and friends as per subjoined list, which also includes Journals from the Reading Room bound, and Transactions from other Societies. The Reading Room table has been well supplied with papers and journals for the use of members. The papers not retained for binding have been sent to various quarters, where they have been appreciated.

THE LLOYD'S REGISTER SCHOLARSHIP EXAMINATION has been held over meantime.

AWARDS FOR PAPERS AND ESSAYS.—The subjects were set for Awards as usual, but only one Essay was received, under the Open Competition, on “Refrigeration,” by Alan J. Walker (Graduate), under the designation “Artificer.” It was deemed worthy of the Award and of printing in the Transactions for the special benefit of the junior sections. Books to the value of £2 were selected by and forwarded to Mr. Walker.

The following is a list of the Awards for which the subjects were set by the Committee:—

SIR ARCHIBALD DENNY AWARD FOR SEA-GOING MEMBERS.—Subject: “Hints and Deductions from Practical Experience which may be useful towards improving Ship and Engine Design. Reports upon Consumption of Coal; water per I.H.P. per hour.”

AWARD FOR ASSOCIATE MEMBERS.—Subject: “The Sequence of Cranks in Multiple Expansion Engines and the Balancing of Powers.”

AWARD FOR ASSOCIATES.—“The Internal Combustion Engine for Marine Purposes; the Various Fuels which may be used and their Combustive Merits.”

AWARD FOR GRADUATES.—“The Main Engine Shafting from and including the Crank Shaft; how lined off and fitted into a new vessel from the Propeller; also the Stern Tube with detailed description of the latter.”

AWARD FOR OPEN COMPETITION.—“The Refrigerator. Different Systems and their Adaptability for Various Services on Shipboard.”

For these Awards the “Stephen Legacy” is available, supplemented when necessary by special donations. The subjects given above remain as set for the new Session, except the last-named, which will be announced later.

“**JOHN I. JACOBS MEMORIAL AWARD.**”—An Award has been established by the kindness of Mr. J. H. Jacobs in memory of his brother, who was a Companion of the Institute and took a great interest in our proceedings. £200 was invested in Consols so that the interest might be available for Awards. The Trustees of the Fund are the Chairman of Council, the Hon. Treasurer and the Hon. Secretary, appointed by desire of the Donor.

TITANIC ENGINEERING STAFF MEMORIAL FUND.

—Under the *Titanic* Engineering Staff Memorial Fund, a child of Mr. L. Baxter, Marine Engineer, was duly passed for admission to the Merchant Seamen's Orphanage, but subsequently a relative invited the widow and children to accept his hospitality; they were thus provided for, and the case was withdrawn. A grant of £5 5s. was made to the widow of an engineer who was lost when the ship on which he was serving went down with all hands.

The children who have been placed in the Merchant Seamen's Orphanage through the Fund are as follows:—

Kenneth Charles McFarlane, admitted May, 1916, is reported as a good lad and doing very well.

Maud Nicholson, admitted September, 1914, developed tubercular trouble, and was removed by her mother during last summer.

The children of Marine Engineers in the Royal Caledonian Orphanage are as follows:—

Ian Mackenzie, Geo. D. Mackenzie, Kathleen Mackenzie (*father died on 1st March, 1913, following an accident sustained on 28th February through the bursting of a boiler tube of a steam barge of which he was part owner); Ronald A. Fenton and Margaret Fenton (father died on 18th April, 1914, of valvular disease of the heart); Alex. M. Fleming, Flora Fleming, Jessie Fleming and Ethel Fleming (*father drowned at sea on 21st December, 1911); Daniel P. Francis (*date and cause of death of father not known); John B. Johnston (*father died in March, 1907, of pleurisy).

It is gratifying to know that the children we were interested towards placing in the Orphanages are well reported of, and as many orphans of deceased members have been educated and trained in these institutions in years past, it is fitting that acknowledgment should be made to show our indebtedness for the good work they are doing.

Donations received during the year towards augmenting the Fund are noted below, and the thanks of the Committee and

Council are accorded to the members who have kindly contributed.

1917.			1917.		
	£	s. d.		£	s. d.
Mar. 28.	F. W. Smith ..	1 1 0	July 5.	Geo. O'Neil ..	0 5 0
May 16.	C. L. Holthusen	1 1 0	„ 5.	J. McMenemy ..	0 5 0
„ 31.	R. J. Beveridge	1 1 0	„ 6.	A. E. Windram	0 10 0
„ 31.	J. McFarlane ..	0 5 0	„ 24.	A. Girdwood ..	2 0 0
„ 31.	Jas. Stewart ..	2 2 0	„ 26.	Alex. Morrison..	1 1 0
„ 31.	Thos. Don ..	1 1 0	„ 31.	J. C. Fitzgerald..	5 0 0
June 1.	C. A. Beldam ..	10 10 0	Aug. 7.	A. J. Elderton ..	1 1 0
„ 1.	H. A. Ruck-Keene	2 2 0	Sep. 12.	W. J. Sheehan ..	0 5 0
„ 4.	R. P. Jenkins ..	0 10 0	„ 7.	J. Sim ..	0 15 0
„ 5.	J. Paterson ..	0 10 0	Oct. 26.	L. G. Walker ..	0 5 0
„ 8.	Geo. Hutchison	1 0 6	„ 30.	F. G. Ritchie ..	2 2 0
„ 9.	J. D. Rossolymos	0 2 6	Dec. 11.	D. Turnbull ..	5 0 0
„ 21.	R. H. Strong ..	1 1 0	1918.		
			Jan. 7.	J. Sheehan ..	0 5 0

The Revenue Account and Balance Sheet follow the Auditor's Report. The amounts allocated from the fund are as follows:—

	£	s. d.
The Royal Merchant Seamen's Orphanage	80	0 0
The Royal Caledonian Orphanage	10	10 0
The Wanstead Infant Orphanage	10	10 0
The Royal Scottish Corporation	2	2 0
Grant to widow of Engineer	5	5 0
	<hr/>	
	£108	7 0

A grant of £5 5s. was made from the General Fund of the Institute to the British and Foreign Sailors' Society Centenary Fund, under the auspices of Lady Jellicoe.

STANDARDISATION OF SHIPS AND MACHINERY.
—The subject of *Standardisation of Engines and Boilers* was before several Institutions for discussion, and resulted in a Conference, with the subsequent appointment of a Committee designated “The British Marine Engineering Design and Construction Committee.” The following members were appointed to serve on the Committee as representatives of the Institute:—

Messrs. B. P. Fielden, W. Veysey-Lang, Thos. McLellan and A. Walker.

CORRESPONDENCE WITH THE ADMIRALTY.—As a result of consideration and conference on this subject, promise is given of improved conditions with regard to the Engineering Department of the Royal Navy, and it is hoped that most, if not all, of the disabilities under which engineers in the Artificer branch and in the auxiliary vessels will be removed,

thus bringing about greater harmony throughout the Marine Engineering Service of the Empire, including both the Royal and the Merchant Navy.

EDUCATION AND TRAINING OF MARINE ENGINEERS.—This subject has been occupying considerable attention on the part of employers and the various engineering societies. Committees have met and conferences have been held in the leading centres of engineering industry, and an organisation has been formed termed "The Engineering Training Organisation," with the object of helping and advancing the education and training of the rising generation of engineers. The Institute is represented by the Hon. Secretary on the Council of the Organisation.

The Obituary List, with biographical sketches of those members who have died during the year is placed on record with regret and deep sympathy for the relations and friends of the departed.

OBITUARY.

CHARLES ANDERSON (Member), of Windygates, Fife, died at a nursing home in Edinburgh on the 18th March, 1917. He had retired from the service of the British India S.N. Company some years before. He joined the Company as a junior engineer in 1874, and served for several years on the Indian coast. For a short time he was on the Home Line, sailing from London to Bombay in the *Ethiopia* as chief engineer, but subsequently returned to the Indian trade. Mr. Anderson was elected a member of the Institute in November, 1891.

JAMES ANDERSON (Member), Ch.E.A., R.N., was elected a member of the Institute in June, 1911. (See March issue for biographical notice.)

FRANCIS G. BECKETT (Graduate) joined the Institute in 1914. (See October issue for biographical notice.)

C. L. BRADLEY (Member) was elected a member of the Institute in December, 1912. (See October issue for biographical notice).

ARCHIBALD COOK (Member), who died in September, 1917, was elected a Member of the Institute in 1912. Born at Greenock in July, 1863, he received his early training with his father's firm of Messrs. D. and A. Cook, Smiths and Chain-makers, afterwards with Messrs. Caird and Co., and Messrs. Kincaid and Donald, Greenock. He commenced his sea-going career as second and chief engineer in many of the well-

known yachts of those days. In 1902 he went to Singapore and joined the Straits Steamship Company, being latterly Chief Engineer of their largest steamer. In 1911 he retired, but, being of an energetic nature, he returned in 1913 to Singapore and joined the Heap Eng. Moh. SS. Co., and in 1915 became their Marine Superintendent. In 1916 he amalgamated with Mr. F. G. Ritchie in the firm of Ritchie and Cook, Consulting Engineers and Marine Surveyors. Mr. Cook, while in Singapore, was a great worker in the Association of Engineers, and it was while acting as Hon. Treasurer that the Association was able to build up a substantial reserve fund. Mr. Cook was unmarried.

CHARLES COOPER (Member) was elected a member of the Institute in May, 1916. He served his apprenticeship with Messrs. W. B. Thompson, Dundee.

J. A. CRICHTON (Associate), Major, R.E., joined the Institute in December, 1910. (See October issue for biographical sketch.

PETER T. CAMPBELL (Member).—Intimation of the sudden death of Peter T. Campbell was received with universal regret by his many friends and associates, and keen sympathy towards



PETER T. CAMPBELL (Member),

Mrs. Campbell and her family circle. He had recently returned from the East after a protracted absence, and appeared to be in good health, but eight days after reaching home at Muswell Hill he suddenly expired on January 30th. The body was conveyed to Scotland and consigned to rest in the Greenock Cemetery beside the remains of his forbears.

Born in September, 1869, at Sandbank, Argyllshire, he was educated at Greenock, afterwards serving his engineering apprenticeship in the works of Messrs. Rankine and Blackmore. He went to sea in the SS. *Bavaria*, and afterwards joined the *Wastwater*. Obtaining his certificates, he transferred to Messrs. Turnbull, Martin and Co.'s Shire Line, and sailed as chief engineer in the *Fifeshire*, then in the *Nairnshire*, and after some years' sea service in the company he was appointed, in 1898, to superintend the building of a new *Fifeshire*, followed by a new *Nairnshire*. The official appointment of superintendent engineer was bestowed upon him in 1899, when other steamers were added to the line, including the *Ayrshire* and *Argyllshire*. A severe illness and subsequent weakness led to his resignation of the appointment as superintendent engineer, and after returning strength fitted him to undertake the duties of office he started as a consulting engineer, in 1912, and undertook work in connection with underwriters' requirements. In November, 1916, he left for Singapore to arrange for a supervision of the repairs of the internal combustion-engined SS. *Glenartney*, damaged by fire, and only returned on January 22nd, 1918. While in Singapore his health broke down, and an operation for appendicitis was followed by an attack of dysentery and pleurisy. The photograph reproduced was taken about four years ago, when he was in Spain on business.

Mr. Campbell was elected a member of the Institute of Marine Engineers in 1896-7, when Sir Edwyn S. Dawes was President. He became a member of Council in 1913-4, and always took a very warm interest in the operations of the Institute. He was convener of the special Finance Committee appointed to deal with questions arising out of the administration of the fund subscribed for the new building.

ALEXANDER S. DUFFUS, who died suddenly on the 17th March, 1917, on his way to business, was elected a Companion of the Institute in November, 1910. He was partner with Mr. F. T. Irwin, 79, Mark Lane, the London representatives of Messrs. Bremner and Co., oil manufacturers. His pleasant

manner and nice conception of duty and obligation caused him to be regarded by those who knew him with feelings of friendship and respect, and his sudden death was noted with regret. One of his sons had been killed at the front a few weeks previously, and this greatly affected him, and no doubt hastened his end.

PETER DENNY (Vice-President), who died on the 18th November, 1917, at Dumbarton, was elected a member of the Institute in March, 1889. (See January issue for portrait and biographical sketch.)

Sir A. J. DURSTON (Past President) died 18th April, 1917. He was elected a member of the Institute in December, 1894. (See October issue for portrait and biographical sketch.)

A. B. GERRIE (Member) died on the 15th October, 1917, of malarial fever on his way home from the East, and was interred at Aberdeen on the 20th of the same month. Mr. Gerrie, who was 50 years old at the time of his death, was born at Aberdeen and educated at Robert Gordon's College of that town. His apprenticeship was served with Messrs. Jas. Pirrie and Sons, Ltd., Aberdeen, and he also worked a year with Messrs. Alexr. H. Hall and Sons. He went to sea in 1889 as 3rd engineer in the SS. *Sunbeam*, of Hull. After rising to 2nd, and then to 1st engineer, he became chief engineer of the SS. *Castle Eden*, belonging to Messrs. James Settle and Co., of Glasgow, and remained in their service until his death last October, a period of 21 years. Mr. Gerrie held Lloyd's silver medal for special services rendered at sea in July, 1900, while serving in the SS. *Border Knight*. He was elected a member of the Institute in January, 1901.

JOHN GRIEVE (Member) was elected in 1909. (See March issue for biographical notice.)

JOHN I. JACOBS (Companion) died suddenly at Hindhead on the 18th August, 1917. Mr. Jacobs was the founder of the firm of John I. Jacobs and Co., of 6, Billiter Street, London, whose fleet then consisted of eighteen sailing vessels. Under the able management of Mr. Jacobs, these were rapidly replaced by steamers, and the business prospered greatly. He was also well known as a capable sale and purchase ship-broker, and was one of the founders of the Institute of Ship-brokers in London, of which he became the first Chairman of Council. Mr. Jacobs took a keen interest in the affairs of the Institute of Marine Engineers, of which he was elected a

Companion in January, 1908. A sum of £200 has been invested in Consols for Awards, to be called "The John I. Jacobs' Memorial," and presented to the Institute in memory of his brother by Mr. Joseph H. Jacobs.

FREDERICK PERCIVAL JONES (Member), Engr.-Lieut., R.N., was elected in January, 1915. (See March issue for biographical notice.)

J. D. McARTHUR (Member) died at Sunningdale, Berks, on the 24th March, 1917, aged 45. He was elected a member of the Institute in March, 1899. He served his apprenticeship with the London and Glasgow Engineering and Shipbuilding Company, Ltd. Mr. McArthur was a past Vice-President of the Institute, and gained the Denny Gold Medal for a paper entitled "A Comparison between the Performances of two Steamships." Mr. McArthur was established for twelve years in Siam as consulting engineer, and also acted as Surveyor to Lloyd's Agents and Bureau Veritas. Subsequently, he was appointed as engineer to the Grand Canary Coaling Company, with management of their engine works and salvage plant. In November, 1915, he had charge of the extensive salving operations of the R.M.S.P. *Pembrokeshire*, stranded on the south of Grand Canary Island, and was successful in refloating her, but had to return to England in the September of the following year to undergo an operation, rendered necessary by an injury received whilst engaged on that work. He was appointed to the Inspection Department of Woolwich Arsenal, but had to resign last February on account of ill-health. His interest in the Institute was keen to the last, and a paper entitled "The Utilisation of Coal," of which Mr. McArthur was the author, was read on November 7th, 1916.

FRANK S. MARWOOD (Member) was elected a member of the Institute in March, 1915. (See March issue for biographical notice.)

Mr. DAVID MILLER died at Liverpool on 28th April, 1917, at the age of 63. A native of Falkirk, Mr. Miller received his early education in Scotland, and was articled with Messrs. Barclay, Curle and Co., of Glasgow. In 1882 he joined the premier Spanish Mail Steamship Co., the *Compania Transatlantica*, and sailed in several of their steamers as Chief Engineer for about five years. In 1887 he was appointed Assistant Superintendent Engineer at the port of Cadiz, where this company have an extensive shipyard. That position he held up to 1900, when he was transferred to Liverpool as

Superintendent, which position he had held for 17 years. Mr. Miller resided in Bootle, and, taking a warm interest in social movements, made many friends both there and in Liverpool.

H. V. MILLER (Graduate) joined the Institute in 1910. (See October issue for biographical notice.)

G. J. NEWLANDS (Member), Engr.-Sub-Lieut., R.N.R., was drowned on April 11th, 1917, whilst on active service. He was a native of Edinburgh, and served his apprenticeship with Messrs. L. and H. Morton and Co., Leith. He was elected a member of the Institute in October, 1906. (See October issue.)

DAVID E. REES (Member), joined the Institute in April, 1917. (See January issue for biographical notice.)

JOHN WRIGHT (Member), the notice of whose death on December 10th, 1916, did not reach the Institute until October, 1917, was elected a member in March, 1901.

The references to the various issues in the above notes indicate the dates when reproductions of photographs and historic sketches were published, so that members desirous of binding these in one separate booklet may have an opportunity of doing so, in order to preserve a record of our brethren who have fallen at the post of duty. All honour to them.

On behalf of the Council,

JAS. ADAMSON,

Hon. Secretary.



The HON. TREASURER: It is again my duty to give you some idea of how the finances of the Institute stand after the last year of work. I am sorry to have to apologise, in the first place, for the accounts not being available until this afternoon, but the Chartered Accountants have been very much driven in getting through their work under present conditions, and we were unable to get the accounts ready before. The Hon. Auditors also were unable to deal with their part of the accounts until this evening, so that there are one or two points which escaped consideration, and there are some slight modifications necessary to be made in the printed sheets put before you. I have had a letter from the auditors to-day giving their usual statement, and, although I have to inform you that the balance is on the wrong side as compared with last year, I think you

will agree that the deficit is more apparent than real. The revenue account shows a loss of £61 4s. 2½d.; but this is more than accounted for, and practically accounts for that deficit and the difference between it and last year's excess balance by the extra cost of printing the papers and discussions as compared with last year. I do not think there is any question that the Institute should not cut that amount below what is necessary to let every member have an idea of what is going on, and the Transactions are the most important means of communication between the Institute and the members, especially those who are at sea. One satisfactory item is the total amount received from subscriptions, £1,489 17s. 6d., which is £42 12s. 4d. more than last year. There is an increase in the amounts derived from investments of £22 7s. 3d., and an increase from advertisements of £11 14s. The decreases under the heading of "gross revenue" are a small sum from the Transactions section and a sum from the Stratford property, represented particularly by taxes and expenses in connection with the property, which returns £20 7s. 9d. less than last year. As regards expenses, I have already mentioned one increase, that is in connection with the printing of papers and discussions, which amounts to £131 7s. 3d. That increase alone, you will see, more than covers the deficit on the revenue account. There is also an increase of £105 17s. on the general expenses, the greater part of which is due to the secretarial conditions during the past year. Under the heading of decreases the main item is that, whereas last year we had a charge of interest on bank loan, we have paid off the loan, and there is now no interest to pay. This represents a difference of £75 12s. 9d. as compared with last year. These points are, I think, the principal ones in connection with the general revenue account. With regard to investments, I might read this part of the auditors' letter:—"The increase in expenditure is chiefly due to the enhanced cost of printing. Donations during the year to the City Premises Fund amounted to £45 7s. The General Fund Investments are the same as last year," but you will notice two items under the heading of "Investments Building Fund," one of £200 of 5% War Loan, and one of £10 in War Bonds. These investments represent money received on account of the Building Fund in excess of the actual cost of the new premises. Referring back to last year's Annual Meeting, members who were then present will remember there was a proposal by the Hon. Auditors that there should be some form of redemption fund to provide against the expiration of the lease. The matter was thoroughly considered by the Council, and it was

decided that any further monies received as contributions to the Building Fund should be invested to form the nucleus of a sinking fund and to re-invest the interest as it accrues. The Auditors proceed:—"The Furniture Account has been charged with depreciation amounting to £49 3s. 11d. and the Electric Fittings Account with £7 15s. 9d. for the same purpose. We have verified the investments inscribed at the Bank of England and the London County and Westminster Bank, Ltd., and the bank balance. We hope to verify the other investments and to inspect the title deeds at Stratford to-morrow. We have obtained all the information and explanations we have required. In our opinion the Balance Sheet of your Institute has been properly drawn up so as to exhibit a true and correct view of the state of the Institute's affairs according to the best of our information and the explanations given to us and as shown by the books of the Institute." There are two features where slight modifications may be made in the accounts as printed. One is a small item of "expenses" included in the sundries of the general account, and which should be charged to the *Titanic* Memorial Fund. This amounts to £1 5s. Another point was brought to my notice in discussing these matters with the Hon. Secretary and the Hon. Auditors. The Library Account as it is printed appears as though no items were paid out on that account. As a matter of fact, the Reading Room expenses, an amount of £23 12s. 3½d., should properly be placed against that account. If these corrections be made it will reduce the deficit to £36 instead of £61, and in the final printed accounts it will probably be shown in that way. Referring to the amount on deposit in last year's accounts, there was a sum of £150 lying in the bank on deposit. This year there was £200 on deposit, and since the completion of the financial year that sum has been invested in War Loan, so that, although there is a deficit on the working, it shows that the finances are quite good enough to be able to put our spare money to the service of the country. The reason for having that money is, firstly, that the amount of all entrance fees is put straight to the capital account, and this item amounts to £113. Then there is the difference between the credit balances of last year and this year, a sum of £40, and other sums which have enabled us to invest that money. I think these facts bear out my contention that the deficit is more apparent than real. These are the principal features in the accounts; if there are any other matters which members would like to question I shall be pleased to give any information on the subject.

95, CANNON STREET, LONDON, E.C. 4.

5th April, 1918.

To the Members,

THE INSTITUTE OF MARINE ENGINEERS,

TOWER HILL, E. 1.

GENTLEMEN,

We have to report that we have examined and checked the Accounts of your Institute for the year ended 31st January, 1918.

The Revenue Account shows a loss of £61 4s. 2½d., against a profit last year of £100 3s. 7d., a difference of £161 7s. 9½d.,

The Gross Revenue for the year is £1,779 10s. 6d., an increase of £50 13s. 10d. made up of the following decreases and increases:—

	Decreases.			Increases.		
	£	s.	d.	£	s.	d.
Subscriptions	—	—	—	42	12	4
Interest	—	—	—	22	7	2
Transactions Section	1	3	8	—	—	—
Advertisements	—	—	—	11	14	0
Rent Receivable (Stratford Property) ..	20	7	9	—	—	—
General Revenue	4	8	3	—	—	—
	£25	19	8	£76	13	6
				£25	19	8
Increase ..				£50	13	10

The expenses charged to Revenue amount to £1,840 14s. 8½d. as compared with £1,628 13s. 1d. an increase of £212 1s. 7½d. made up as follows:—

	Decreases.			Increases.		
	£	s.	d.	£	s.	d.
General Expenses	—	—	—	105	16	11½
Rent, Rates, Taxes, etc.	—	—	—	23	3	8
House Account	—	—	—	23	11	11½
Stratford Property	—	—	—	6	5	6
Insurance	8	19	9	—	—	—
Reading Room	—	—	—	7	11	4½
Papers, Discussions, etc.	—	—	—	131	7	3
Transactions Section	11	8	3	—	—	—
Interest on Bank Loan	75	12	9	—	—	—
Depreciation—Furniture	2	6	7	—	—	—
Do. Electric Fittings	0	8	3	—	—	—
Legal Expenses	—	—	—	7	14	6
Donation, Lady Jellicoe's Fund	—	—	—	5	5	0
	£98	14	7	£310	16	2½
				98	14	7
Increase ..				£212	1	7½

The increase in Revenue—£50 13s. 10d., taken from the increase in Expenditure—£212 1s. 7½d., gives the figure £161 7s. 9½d. mentioned in the second paragraph.

The increase in expenditure is chiefly due to the enhanced cost of printing.

Donations during the year to the City Premises Fund amounted to £45 7s. 0d.

The General Fund Investments are the same as last year but on account of the Building Fund the following purchases have been made :—

£200—5 ⁰ / ₁₀₀ War Loan 1927/47 costing	..	£190 0s. 0d.
Two £5—National War Bonds 1927 costing	..	£10 0s. 0d.

The Furniture Account has been charged with depreciation amounting to £19 3s. 11d. and the Electric Fittings account with £7 15s. 9d. for the same purpose.

We have verified the Investments inscribed at the Bank of England and the London County & Westminster Bank, Ltd., and the Bank Balances.

We hope to verify the other Investments and to inspect the Title Deeds at Stratford to-morrow.

We have obtained all the information and explanations we have required. In our opinion the Balance Sheet of your Institute has been properly drawn up so as to exhibit a true and correct view of the state of the Institute's affairs according to the best of our information and the explanations given to us and as shewn by the books of the Institute.

We are, Gentlemen,

Yours faithfully,

WEST & DRAKE,

Chartered Accountants.

REVENUE

Dr.

1st February, 1917, to

To General Expenses :	£	s.	d.	£	s.	d.
Bank Charges	1	6	2			
Postages and Telegrams	24	14	6½			
Telegraphic Address	1	1	0			
Engrossing Certificates	5	5	0			
Stationery and General Printing	46	5	3			
Assistant Secretary's Salary	135	0	0			
Honorarium to Honorary Secretary	65	0	0			
Clerical Assistance	142	15	0			
Chartered Accountants' Fee	21	0	0			
Telephone	7	10	0			
Sundries	23	12	9			
				472	4	8½
.. Rent, Rates, Taxes, etc. :						
Ground Rent	295	0	0			
Rates and Taxes	211	11	3			
Gas and Electricity	12	14	0			
Water	30	13	8			
				549	18	11
.. House Account :						
Caretaker	104	0	0			
Coal and Coke	37	8	3			
Cleaner's Wages	13	9	8			
Sundries	3	19	11½			
National Health Insurance	2	8	0			
Window Cleaning	12	12	0			
Repairs	14	10	6			
				188	8	4½
.. Repairs to and Commission re Stratford Property ..						
				7	11	6
.. Insurance						
				17	9	6
.. Reading Room Expenses						
				23	12	3½
.. Papers and Discussions—Printing, &c.						
				470	11	3
.. Interest :						
Denny Gold Medal	10	0	0			
Denny Award	5	0	0			
Stephens' Legacy	2	10	0			
				17	10	0
.. Transactions Section						
				19	8	6
.. Interest on Bank Loan						
.. Depreciation :						
On Furniture	49	3	11			
On Electric Fittings	7	15	9			
				56	19	8
.. Legal Expenses						
				10	10	0
.. Donation—Lady Jellicoe's Fund						
				5	5	0
				£1,839	9	8½

ACCOUNT.

31st January, 1918.

Cr.

By Subscriptions: *						£ s. d.	£ s. d.
Members	..	..	..	..	..	1,465	8 7
Associate Members	..	..	..	..	..	50	5 2
Associates	..	..	..	..	..	12	11 10
Graduates	..	..	..	..	..	14	2 6
Companions	..	..	..	..	..	55	6 0
						<u>£1,597</u>	<u>14 1</u>
,, Less Subscriptions in Advance—						£ s. d.	
Members..	..	..	..	..	..	124	10 3
Associate Members	..	..	..	..	..	0	17 0
Associates	..	..	..	..	..	0	13 4
Graduates	..	..	..	..	..	0	15 0
Companions	..	..	..	..	..	1	1 0
						<u>127</u>	<u>16 7</u>
							1,469 17 6
,, Interest:							
Consols 2½%	..	..	..	..	..	18	3 4
Transvaal 3% Stock	..	..	..	..	..	4	10 0
Local Loans	..	..	..	..	..	11	5 0
India 3% Stock	..	..	..	..	..	9	0 0
Metropolitan Water Board 3% Stock	..	..	..	..	..	9	0 0
Caledonian Railway 4% Stock	..	..	..	..	..	14	14 6
New South Wales 4% Stock	..	..	..	..	..	15	0 0
War Loan	..	..	..	..	..	20	3 9
Deposit	..	..	..	..	..	5	15 5
						<u>107</u>	<u>12 0</u>
,, Transactions Section							4 0 6
,, Advertisements							147 3 0
,, Rent Receivable:							
Stratford Property	..	..	..	..	..	50	17 6
,, Balance							59 19 2½

£1,839 9 8½

THE INSTITUTE OF MARINE ENGINEERS.

BALANCE SHEET, 31st JANUARY, 1918.

Dr.	LIABILITIES.		£ s. d.	£ s. d.
To Sundry Creditors—				
„ Printing, &c.			199	10 8
„ Subscriptions in Advance			127	16 7
„ Life Subscriptions to be Invested			31	10 0
„ Denny Gold Medal Fund			291	7 10
„ Denny Award			115	0 0
„ Stephens' Legacy Fund—				
Balance 31st January, 1917	104	6 10		
Add Interest	2	10 0		
	-----		106	16 10
„ Library Account			37	11 6
„ Open Competition Account			0	2 0
„ Capital Account—				
Balance 31st January, 1917	12,101	8 10		
Add Donations received on account of City Premises Fund	45	7 0		
	-----		12,146	15 10
„ Revenue Account—				
Balance 31st January, 1917	4,872	16 3		
Add Entrance Fees	113	19 11		
	-----		4,986	16 2
Less Balance of Revenue Account	59	19 2½		
	-----		4,926	16 11½

			£17,983	17 2½

	ASSETS.		£ s. d.	£ s. d.
By Cash—				
At Bank on Current Account			319	14 3
Do. on Deposit			200	0 0
In Hand			1	1 9½

			520	16 0½
„ Sundry Debtors for Rent				7 18 4
„ Investments—General Fund—				
£968 13s. 6d. Consols 2½%			726	10 2
£200 Transvaal 3% Stock			183	0 0
£400 India 3% Stock			309	0 0
£500 Local Loans			455	0 0
£400 Metropolitan Water Board 3% Stock			322	0 0
£491 Caledonian Railway 4% Stock			488	2 3
£300 War Loan 5%, 1929/47			285	0 0
£500 New South Wales, 1929/47			499	9 9

			3,248	2 2
Building Fund—				
Two £5 Nat. War Bonds, 1927			10	0 0
£200 War Loan 5%, 1929/47			190	0 0

			200	0 0
„ Freehold Buildings—				
58, Romford Road, Stratford			1,500	0 0
„ City Premises—				
Balance 31st January, 1917			11,068	2 5
„ Furniture—				
Balance 31st January, 1917			983	18 1
Additions			19	10 0

			1,003	8 1
Less Depreciation			49	3 11

			954	4 2
„ Electric Fittings, Lamps and Lighting Apparatus, Bells, &c., throughout				
City Premises			155	16 0
Less Depreciation			7	15 9

			148	0 3
„ Books in Library			300	0 0
„ Rates in advance			36	13 10

			£17,983	17 2½

XXVII

"TITANIC" ENGINEERING STAFF MEMORIAL (BENEVOLENT) FUND.

BALANCE SHEET 31st JANUARY, 1918.

LIABILITIES.				ASSETS.			
		£	s. d.			£	s. d.
To Revenue Account—				By Investments at cost, viz. :—			
Balance 31st January, 1917	2,590	6	11	£1,250 Lancashire & Yorkshire			
Add Balance 31st January, 1918..	50	0	8	Railway 3½ Preference Stock	983	0	3
			2,640	£1,000 Caledonian Railway 4%			
,, Institute of Marine Engineers (Postages, &c)			7	Preference Stock	1,013	8	3
			0	£500 New South Wales 4% Stock..	502	12	0
							2,499
				,, Cash at Bank :—			0
				Deposit Account		80	0
				Current Account		62	12
							142
							1
			£2,641				£2,641
			12				12
			7				7

REVENUE ACCOUNT 31st, JANUARY, 1918.

		£	s. d.			£	s. d.
To Merchant Seamen's Orphanage		80	0	By Donations		41	1
,, Infant Orphan Asylum		10	10	,, Dividends on Investments		73	2
,, Royal Caledonian Asylum		10	10	,, Interest on Deposits		3	3
,, Royal Scottish Corporation		2	2	,, Income Tax Recovered		43	6
,, Expenses, Postages, &c.		1	5				4
,, Accountancy Charges		1	1				
,, Special Grant—Mrs. Noyce		5	5				
,, Balance carried to Balance Sheet		50	0				
			£160				£160
			13				13
			8				8

Mr. J. M. DEWAR: It is my pleasing duty to propose the adoption of the Annual Report and Accounts which have been submitted to you, in the usual able manner, by the Hon. Secretary and the Hon. Treasurer respectively. The first few lines of the Hon. Secretary's report tell us exactly what was in his mind in surveying the work of the past year, and convey to us the satisfaction which he feels in being able to report progress all round under such trying circumstances. I have often heard officials complimented on their stewardship, but surely never has greater commendation been deserved than in the cases of the gentlemen who have just presented the fruits of their labours to us. Every credit is due to them for having so ably conducted the affairs of the Institute under disabilities which can only be faintly realised, except by those who have had the work of the session to attend to in the times of upheaval through which we have passed and are passing. It is gratifying to read that although the cost of printing and stationery have increased, it is still intended to continue the publication of the monthly reports of the transactions of the Institution, for these must undoubtedly be looked forward to by many members who are unable to attend the meetings. These monthly reports not only enable members to thoroughly absorb the valuable information given in the excellent, up-to-date papers which are so generously contributed, but give them the advantage of having before them also the discussions on those papers, which add so largely to the usefulness of the proceedings, very frequently revealing knowledge and experience which are of inestimable value, and which could not be obtained from all the text-books ever written.

Apart, therefore, from the tangible value obtained from the publication of the monthly proceedings of the Institute, and looking at the matter for a moment from the commercial point of view, let us hope that the advertisement section will so increase as not only to form an additional attraction, but that it may also be mutually advantageous to all concerned. Coupling this with the Secretary's remarks upon the education and training of Marine Engineers, it is appropriate and most gratifying to see that these important points have been receiving considerable attention on the part of employers and the various engineering societies.

Perhaps never before in the history of the country has the necessity for giving to the rising generation the best education possible been brought home so clearly to us. Though this applies in a marked degree to the profession to which we belong, the

newly awakened interest in education affects the nation at large. Mr. Lloyd George truly said that the war at present being waged is an engineers' war; and though there have been many admirable achievements in other branches of engineering, the marine engineer has not been far removed, if removed at all, from the very front rank, and throughout this world-conflict he has maintained, in every way, the highest traditions of the profession. To propagate and perpetuate such capabilities education properly applied must be given first consideration, so far, at any rate, as the rising generation of engineers is concerned, and we are pleased to think that so much excellent work can be and is done through this Institute.

It is also gratifying to see that the membership roll shows a further increase for last year, and now we may hope to see very soon the total up to the 2,000 which has been so steadily aimed at. In benevolence and good works generally the Institute continues to show an excellent record, as is evidenced by the statements made under the heading "*Titanic Fund.*" The Institute as a whole is indebted to the donors who have so kindly and generously contributed to this deserving charity.

It is pleasing to note that such a strong delegation was appointed to represent the Institute on the British Engineering Design and Construction Committee. We feel sure that in this instance, at any rate, there were at least four men dealing with a subject with which they are thoroughly acquainted, a happy state of things which has not been so apparent in many other instances where some recent committees have been appointed.

Under the heading "Correspondence with the Admiralty," it is gratifying to note that a promise has been given of improved conditions in the engineering department of the Royal Navy. There can be no sound reason why mercantile marine engineers should not by direct entry, immediately on being drafted to vessels of the Royal Navy, occupy the same position and enjoy the same advantages as the engineer officers of the Fleet who have attained their rank through service, especially during such a national crisis as the present. It is to be sincerely hoped that the efforts made by the Institute in this direction will be productive of the very best and most satisfactory results. Men belonging to the merchant service have, by virtue of the work they have been called upon to do, become practically Naval Volunteer Reserve men. There is no doubt they are sharing, with less protection than the naval engineers on board His Majesty's armoured ships enjoy, in every way, and to the same extent, the vicissitudes and perils of marine

warfare. In transport work, mine-laying, mine-sweeping, patrol, and the maintaining of the regular services of the mercantile marine generally, no better record of devotion to duty and heroism could be furnished than that established by the marine engineers. It is incumbent upon the Admiralty, therefore, to see that all the disabilities under which these men work are removed, not only in the letter, but in the spirit also, so as to bring about the perfect harmony and *esprit de corps* which should exist between the Royal and Merchant Navies.

The value of the work done at the present time by the marine engineers in the Royal Naval Reserve can largely only be imagined. It must be left till after the war to arrive at a clear understanding of what they have accomplished. A glance at the Naval Annual for 1915 shows that the following numbers of marine engineers were then serving in the Royal Naval Reserve:—

Chief Engineers	...	...	...	...	47
Senior Engineers	...	...	...	...	60
Engineers	...	...	...	...	361
Assistant Engineers	...	...	...	...	532

A total of 1,000

Efficient and well organised as the Royal Navy was in the early days of the war, it was soon found that it was impossible for the Grand Fleet to deal with the mines with which the Germans had strewn the sea. To cope with this menace, a call had to be made on the merchant service, and the above numbers of marine engineers alone answering the call give some idea of the spontaneity of the response of all classes of sea-going folk, and even civilians. At a rough computation, it would appear from the Navy List of January this year that there are now upwards of 2,000 marine engineers serving in the Royal Naval Reserve, and it is only right and fitting that the interests and well-being of this fine body of men should be safeguarded and their conditions improved in the way this Institute has done its best to bring about.

I cannot close these few remarks without a brief reference to the unfortunately somewhat vexed question of standard ships. The position, as it appears from the daily papers, would seem to be somewhat disquieting, and invidious comparisons are made, or at any rate hinted at, between firms who are and those who are not turning out these ships as quickly as some would wish. This is not

the time to enter upon explanations as to the special circumstances obtaining in the various shipbuilding centres which affect the output of this class of tonnage. Suffice it to say that all will be made clear after the war, when the censorship, together with a host of other vexations and restrictions, will be a thing of the past. It has been said that even if standard ships could be turned out at the desired rate, crews could not be found for them. Be this as it may, I have no hesitation in stating that if the necessary tonnage is produced there will be no question of finding marine engineers, at any rate, to man them.

Dealing with the accounts, which have been put forward by our Hon. Treasurer with characteristic capability, it is very gratifying to know that although our expenses have very much increased, the Institute is still so thoroughly solvent. It is a great matter to find that we can put £200 into the War Loan and find another £200 for the Sinking Fund. I am sorry, of course, to see that the expenses are high, but that is inevitable, as we have to pay more to-day for material and labour of every kind. I have very great pleasure in moving the adoption of the reports.

Mr. R. J. McLEOD: Unfortunately the report has just come into my hands this evening, so I have been unable to scrutinise it properly, and cannot comment very much upon the report itself; but I beg to associate myself with all Mr. Dewar has said with regard to the condition in which the Institute finds itself. Dealing with the financial statement, the expenses have gone up; but that is inevitable. All expenditure, right throughout the country, has gone up; but looking at the matter in all its aspects, I think the Institute is in a very prosperous condition and that we have some very good, realisable assets. The increase in membership is a healthy sign in an Institute of this description. We must either go forward or go backward, and an increase in membership shows a forward movement. With regard to the monthly publication, I look upon this as the principal line of communication between the Institute and the members, especially those members who are very seldom able to be present. This line should be kept up, and any economies should be in other directions, apart from the Transactions. I am a little disappointed that we have only received £147 for advertisements. I think, in all probability, it will be found that our advertising rates are not commensurate with the times. Personally, I do a good deal of advertising, and I know that an advance has been made of 25 to 30 per cent. on pre-war

rates, and I think £147 is hardly enough considering the importance of the Transactions as a medium for advertising. Of course, this is only a suggestion; otherwise I think we can congratulate ourselves on the position of the Institute, and I have much pleasure in seconding the motion proposed by Mr. Dewar.

The proposal was then put to the meeting and carried unanimously.

MR. R. LESLIE, R.N.R. : I have a very pleasant duty to perform this evening, although in one sense it is unpleasant. We have our President here with us, Captain Richard Green, R.D.C., who is on military duty at the present time. We are sorry that he is with us for the last time in the office of President, but that we cannot help. We were very pleased to have him as President for the past session, and we must all feel that he is a gentleman fully qualified to hold the appointment, being connected with one of the oldest shipbuilding and engineering firms in the world. It is our pleasant duty this evening to give him a good hearty vote of thanks for his services as President during the year, and not only as President, but as a great friend to the Institute. Those who know the inner workings of the Institute know the influences that have been brought to bear to help on the Institute. We have a long list of Past-Presidents of high rank, and our last is one of the best. He has a fellow-feeling with all "those who go down to the sea in ships and earn their bread upon the waters." He also has a fellow-feeling with engineers, and we are highly gratified to have been favoured with his assistance, and that he has spent so much time with us and has done so many good things for the Institute. I ask you to accord a very hearty vote of thanks to our retiring President.

MR. JAS. SHANKS: I have very much pleasure in seconding this vote of thanks to our retiring President, and it gives me great pleasure to emphasise every word Mr. Leslie has said with regard to Captain Green. He is intimately associated with everything connected with shipping in the City of London, and probably he is an intimate friend to most of us here. Personally, I have known him for the last 28 years, not only as a friend, but in different business relations, and in each sphere of life he has been a thorough gentleman in every respect. He has endeared himself to us all and proven himself a friend of marine engineers. In the Presidential Address the question was raised about the interest we should take in the education of marine engineers. He emphasised what an Institute such as

ours might do, and I am sure the Council will take advantage of his suggestions. The name of Green is a household word in Poplar, and I think Captain Green was the first Mayor of that borough—a fact that should be remembered. I am sure it is the wish of the members of the Institute that we convey to Captain Green our deep gratitude for the valued services he has rendered during the past year in the office of President, and I have great pleasure in seconding this vote of thanks, which I am sure all the members will heartily endorse.

The vote of thanks was carried with acclamation.

The PRESIDENT: Mr. Leslie, Mr. Shanks and gentlemen,—I thank you very much for the very warm way in which you have given me this vote of thanks at the end of my year of office. I am sure I have done very little in the position, although the Institute and its work have been constantly in my thoughts. Of course, the President of an Institute of this kind is entirely in the hands of the members and officers, and I can only say that the Hon. Secretary and Hon. Treasurer and other office-bearers have done everything in their power to make my work as easy as possible, and I thank them for the help and support they have given me. With regard to the accounts, I think the Institute is to be congratulated on its Hon. Treasurer. He has displayed unusual financial ability in persuading us that what appears to be one thing is quite another thing altogether. He tells us a beautiful tale of the state of the accounts, then he shows us that this is not the actual thing at all, and he ends by pulling £400 out of the bag and placing it to the credit of the Institute's investments. I was never much of an accountant; I am quite content to leave that part of the business to others; what is left on the table at the end of the year is the only thing under that heading that interests me, and so, whatever the accountants and Secretary have agreed to put down on paper, the members of the Institute may take hold of the solid fact that cash has been added to the resources of the Institute, and they can leave it to the Treasurer to say where it comes from. But I should not like to leave even a seeming slur on the position of the finances at the end of my year of office; therefore, if the members will accept it as a token of my year as President, I will have very much pleasure in wiping off the deficit for the purpose of relieving your Treasurer from his anxieties. It will be a privilege for me to mark my year of office in that way, and the accounts will go forward to my successor without any stain. I am very gratified with the

vote of thanks given me, and I am sure my successor will receive the same measure of support that has been given to me.

The HON. TREASURER: I think, gentlemen, that Captain Green, in his closing remarks, has again laid the Institute under a great debt of gratitude to him. Juggling or no juggling, he is determined not to have a deficit, and I have very much pleasure, on behalf of the Institute, in accepting that offer.

Mr. O. B. RICHARDSON: I have much pleasure in proposing a vote of thanks to office-bearers and members of Council. It is a wonder to me how in these strenuous times they find time to carry on. They are men of high standing in the marine engineering world; many of them give time to special constable and other duties. We who were favoured to hear our President's Address know that he is prepared to support the technical training of the juniors in a practical way, but I should like to say that the membership is not rising as much as some of us would wish. It is still a very small percentage of the marine engineers, and especially is it to be regretted that, in spite of the efforts to be put forth from the last annual meeting, the junior section makes a very poor show on the list. The remedy for this, in my opinion, would be that those marine engineers who employ apprentices ought to make it their duty to put forth the advantages of belonging to this splendid Institute, and if this was done personally, from the Head, I think the result would be many would join and qualify to become useful members and carry on this Institute after a few of we old hands have finished. I have much pleasure in proposing the vote of thanks.

Mr. S. G. MARTLEW: It is my pleasant duty to second the vote of thanks to the office-bearers and members of the Council which has just been put before you. Arising out of the war, there has been an increasing difficulty, I know, in carrying on any society or institution, and it is, therefore, greatly to the credit of the office-bearers that they have, during the past year, done so well in maintaining the traditions of the Institute and in providing a technical home for marine engineers in the premier marine engineering country of the world. I beg to associate myself with the remarks of the last speaker concerning the suggestion as to letting young engineers and apprentices know of the advantages of such an institution as this. I was quite unaware, until I started going to sea, of what it would mean to become a member of such a society or institution, and I am

quite sure that had I been informed of the value of the Transactions, the high type of engineering knowledge which could be acquired by mingling with the members of such an Institute, the reading of papers, and more particularly the discussions on the papers, I should have endeavoured to become a Graduate as soon as ever I started my apprenticeship.

The motion was then put to the meeting and carried.

Mr. A. BOYLE: On behalf of the office-bearers and members of Council I have to thank you very much for the very kind words used in proposing and seconding this vote of thanks and also for the very hearty response to the proposal. To have a vote so proposed, so seconded and so received, will always be a great encouragement to the office-bearers and members of Council in carrying out the duties of the Institute. There is a good deal of work to be got through, such as dealing with correspondence, discussing financial matters and considering the applications for admission as members of the Institute, and although the office-bearers and members of Council, probably without exception, are all very busy men, I can assure you this work of the Institute is very seldom in arrear, which speaks well for the time freely given in carrying on the business of the Institute. I quite agree with and endorse what has been said by the proposer and seconder of this vote of thanks, but I should like, if I may, to add a few words of a more personal nature. It is twenty years since I first had the honour of being elected to be Chairman of Council of the Institute, and since that time I have been in close contact with and have taken an earnest interest in the welfare and progress of the Institute. I should like to take this opportunity of thanking the members of successive Councils, and also of thanking the members generally for the courtesy and consideration which has always been extended to me; but I think it is advisable, in the interests of the Institute, to encourage much younger men than myself to come forward and take an active part in the affairs of the Institute. I believe everyone owes a duty to the profession by which he lives. It is a duty for the members of the Institute to devote some part of their time to its welfare by always exercising the right to vote for members of Council, by attending the meetings, taking part in the discussions and, as it were, throwing into the common stock of knowledge any information and experiences they may possess on the subject in hand. By doing so they are doing something for the advancement of marine engineering and also helping to repay their obligation to the profession to which they belong. It is difficult to explain

why, with so many engineers, we still have a comparatively small membership; but we are gradually increasing in numbers, our influence is increasing and our value to seafaring engineers is increasing. Amongst the large body of marine engineers there must exist a vast amount of practical experience and knowledge of detail not widely known. Such knowledge should not remain within a limited circle, and one of the greatest advantages of this Institute is to give publicity to that valuable knowledge and experience which might otherwise be lost, and depend upon it that the giver of information benefits as well as the receiver. I would again thank you for so kindly according this vote of thanks to the office-bearers and members of Council.

The PRESIDENT: I regret that I shall now have to vacate the chair as I have another appointment this evening, for which I am already overdue. With your permission, I shall ask Mr. Boyle to take the chair in my place.

Mr. Boyle then took the chair.

Mr. WM. McLAREN: I have great pleasure in proposing a vote of thanks to our Hon. Auditors, Messrs. Clark and Robertson. There are about 130 items in the accounts presented to us, which must have meant some difficulty and responsibility in investigating, checking and passing on as correct. I think it is our duty to give our thanks to these gentlemen for acting in their spare time, of which they have not a great deal at the present time. I also wish to propose that Messrs. Harvey and Timpson be appointed Hon. Auditors for the ensuing session.

The proposal was duly seconded by Mr. NEWTON and carried.

Mr. W. E. FARENDE: I have to report that, with my colleague, we have been through the voting papers for the election of office-bearers and members of Council for the ensuing year, and the result is as follows:—

President: Mr. J. T. Milton.

Hon. Secretary: Mr. Jas. Adamson.

Hon. Treasurer: Mr. A. H. Mather.

New members of Council: Messrs. J. M. Dewar, G. J.

Wells, H. K. Fletcher, Wm. McLaren and H. R. Houldin.

CHAIRMAN: I think this report is very satisfactory, and I am sure the gentlemen appointed by vote of the members will realise that it is a great mark of confidence, because the affairs of the Institute are really in their hands. I can speak as one who has held the Chairmanship of the Council more than most. I am confident they will do their best to assist the Institute

throughout the year. The next business is under the heading of "Recommendations." This is a feature that has gradually grown at succeeding annual meetings until it has become a very important part of our proceedings. It simply means that any member can bring forward his suggestions on any subject which he thinks may be useful; he may bring forward any recommendation which he thinks would be of advantage, or he may criticise what has been done, or suggest any alteration in our system which he thinks would be an improvement. Criticism is a good thing, and the members of Council would rather have criticism than take matters in hand and afterwards find that some of the members are not satisfied. It is therefore open for any gentleman present to say what he thinks of the work of the Institute during the past twelve months.

Mr. R. LESLIE: As one of the oldest members of the Institute, going back a long way, being No. 7 on the roll, I have come to the conclusion that for some time past we have been going along the line of least resistance, so far as secretarial work is concerned, and it appears to me that the duties performed by our Hon. Secretary have grown as the Institute has grown, and I hope it will continue to grow more than ever after we have won this war. I do not know whether I am right at the present moment in bringing this matter forward, but as all the members of the Institute are invited to come up to the Annual Meeting to discuss the affairs of the Institute I think it is a suitable occasion to do so. I do not like one of the items the Hon. Treasurer has given us in his report, viz., the gratuity to the Hon. Secretary. I think we should now approach a point of more importance, and that is, we should pay our Hon. Secretary as paid Secretary of the Institute, and not allow him to do the work in an honorary position. I am strongly of opinion that he ought to be paid. We are two of the oldest members of the Institute, and I see no reason why, as a good servant of the Institute, he should not be paid by the Institute. Other institutions have paid secretaries to do this work. I have seen something of the time Mr. Adamson has put in in this Institute, not only during war time, but for many years past. From the financial statement made to-night by our Hon. Treasurer the Institute is in a good position and fully capable of paying the Secretary for the duties he performs.

CHAIRMAN: I should be very pleased to hear the opinions of the members present on this matter. Mr. Leslie has raised a most important point.

paying for, and if Mr. Leslie and Mr. Thom are prepared to send the suggestion forward to the Council, I am sure it will be well considered. In Mr. Adamson we have a brother; but, more than a brother, we have a father. He has been a guide to young men both on this side and on the other side of the water, which fact I am able to testify of. We have in Mr. Adamson a man who has made the Institute a hobby, a study and his "rocking-horse" all these years. I have much pleasure in supporting what the previous speakers have said, and if this is carried forward to the Council, as one of the members I shall be very pleased to support it.

Mr. F. O. BECKETT: Mr. Adamson is to marine engineers the centre of life. Hundreds I have come across have spoken most highly of the help and guidance he has given. As the last speaker has said, it has been a labour of love, and I think he is most certainly entitled to a reward for the services he gives. I would heartily support the proposal.

Mr. JOHN McLAREN: I have very great pleasure in supporting what Mr. Leslie has said. It is difficult to get work for nothing, and we have had the best part of Mr. Adamson's life working for the Institute. The balance-sheet and the statement given by Mr. Mather are very gratifying, but it seems to me we are in danger of being held up for money hoarding. The balance of the revenue account is something like £5,000. It is not business to ask a man to do the work and then bank the money. Pay the man, and pay him well. We want someone to be the business manager of the Institute, one who is able to hold his own; one who is able to write in the Press—not the engineering Press only, but the general Press—from time to time, and to keep in close touch with all criticism and everything that is taking place which affects the life of the marine engineer. Even at the present time there is scope for that. Wonderful deeds have been done at sea by marine engineers, and those wonderful deeds have gone unrewarded. If we had a man like Mr. Adamson to bring these things forward it would be to the benefit of the Institute and to the marine engineer as a whole. I think it is most fitting that we should now appoint Mr. Adamson as "figure-head" of the Institute of Marine Engineers. There is another thing I should like to mention. At the Annual Meeting last year something was said about the creation of a sinking fund for the redemption of the premises; but not a word has been said in the report about what has taken place. I know it is the feeling of some that the future generation should be allowed to

take care of itself; but it would have been a bad thing for us if previous generations had acted on that understanding. It is the duty for this generation to do something for the benefit of those who are to follow us. Dealing with the question of finance again, we are now dealing with very large sums of money if you take the total of all our assets. I think it would be better for trustees to be appointed by the members to have control of the finances of the Institute. I propose this as a purely business suggestion for the good of the Institute. I do not suggest that any Council elected by the members would be disposed to squander the funds; but as a safeguard we ought to have trustees who would be responsible for investing the money. With regard to the redemption fund, I put forward this suggestion before, and someone went against it and said it was not safe; but I am still firmly convinced that it is the right thing to do. We ought to provide for this, and by the expenditure of a matter of £500 we could put the matter on a sound business basis. We have the money, and we ought to put our house in order. There is a sum of £200 here which has been received over and above the amount required for the Building Fund. I have very great pleasure in supporting Mr. Leslie's suggestion that Mr. Adamson be paid. I myself feel that we have a claim on him. If you ask a favour of him he is always ready to grant it; but we ought to pay him for doing the work of the Institute. We ought to put our backs into the work of the Institute and make it one of the finest institutions in the country. I listened with appreciation to the Presidential Address about the education of engineers. It is an excellent thing; but I would go further: I would go to the shipowners and ask them to treat the engineers better, to give them better conditions, more holidays, more money, and raise their position generally. As a junior I never saw Liverpool in daylight. What prospect has the average boy if he takes up marine engineering? He may get a chief engineer's job at £18 a month. The chief engineer of one of the biggest Atlantic liners, with that great mass of engines to look after, at a salary of £500 a year. That is not enough for an educated man. I should like to see the day when the educated engineer is recognised by the shipowner. I want to see the engineer going up to see the owners and the owners to recognise him as an educated man. I know of cases where the owner does not know his engineer. I am doing my best to do away with that kind of thing, and the day is coming—and the war has brought it forward more quickly—when the importance of

the engineer will be recognised. I should like to see these things brought before the public. Make the profession attractive, and you will get the educated boy to take it up.

Mr. F. M. TIMPSON: As a retiring member of Council, and one who has had a good deal to do with the issue of the Transactions, I should like to support the proposal put forward by Mr. Leslie and Mr. Thom that something be done for Mr. Adamson. I see as much of Mr. Adamson as anybody in the Institute, and in dealing with the Transactions work alone I fully realise the amount of time he has put at our disposal in collecting information to make that part of the Institute's work a success. He comes in to the City twice or thrice a week, and, as Mr. Mather points out, the honorarium granted to him is not for services rendered, but merely to cover expenses. I also very strongly agree with what Mr. McLaren has mentioned, that we should be able to put the case of the marine engineer not merely in the technical Press, but also in the daily newspapers, this requiring a secretary's attention. I have great pleasure in supporting the proposal.

Mr. J. E. ELMSLIE: Having had the privilege of sitting on the Council for eleven years, I had an opportunity of seeing the work performed by Mr. Adamson. No man could have given more time to the affairs of the Institute, and the Institute, in my opinion, primarily owes its position to the work and labour of Mr. Adamson. I have great pleasure in supporting the proposal put forward.

Mr. J. CLARK: I think Mr. Leslie's suggestion—I take it as a suggestion—will become historical in the Institute, and I am sure the members universally will support it. I am speaking, perhaps, with a little inside knowledge when I say that, without a doubt, in everything Mr. Adamson does his influence is always on the side of good; as shown in the report, he does not confine his work to the technical side of the Institute, but he puts himself to an immense amount of trouble on the benevolent side as well. I do not think for a moment the question of finance need concern us; no two members would draw up the Treasurer's report alike. I am not giving any secrets away when I draw attention to the item of £49 shown as depreciation on furniture. I should like to ask which of you gentlemen has depreciated his furniture at the present day and whether he has not raised it 50 per cent. That is only one point, which shows how different people might look at it. The revenue account shows a deficit of £61, but, as a matter of fact,

we could make it £61 on the other side and everyone would agree. I have great pleasure in supporting the suggestion.

MR. W. E. FARENDEEN: I should like to support Mr. Leslie's recommendations as regards Mr. Adamson. I have known him for some time and have seen his work at the Institute. With regard to the suggestion made by Mr. McLaren in connection with a sinking fund, I think something should be done in that direction. If it can be arranged for a small figure I quite support Mr. McLaren in that matter.

MR. A. ROBERTSON: I should also like to add a word with regard to the question Mr. Leslie has brought forward this evening. I have been trying to remember how many years I have been a member of the Institute. It is nearly twenty years since I joined, so that I can speak with some degree of accuracy as to Mr. Adamson's influence. There is no question that Mr. Adamson has been the leading spirit in the Institute of Marine Engineers, and has controlled its operations to a large extent from its inception. Had it not been for the very hard work done by him we should not have been in the position we are. I strongly support the suggestion and presume the correct course would be to make it a recommendation to the Council for consideration; as regards details, the Council will deal with that in due course.

I wish to add a few remarks regarding Mr. McLaren's statements in support of a sinking fund. I do think it is the moment for us to take that question in hand, when it can be done at a very low cost. We can arrange the business with any reliable insurance company; we already know the terms they can give. If I am in order, I should like to put a definite proposition this evening to the effect that this meeting recommends the Council to adopt a definite scheme on those lines—that is by taking up a policy with an insurance company—and not by putting money aside to form the nucleus of a sinking fund. However well the Council might manage it, it cannot be as safe as it would be if we took out a policy with a first-class insurance company.

MR. J. M. DEWAR: I should like to associate myself with Mr. Leslie's suggestion that Mr. Adamson should receive some suitable acknowledgment. I think Mr. Adamson will feel that he carries the gratitude of this Institute for his labours in the past, and he will himself feel remunerated; but I think it will be the duty of the Council to see that it is the first item put on the agenda at their next meeting.

Mr. S. G. MARTLEW: I should like to support the eloquent tributes paid to the Hon. Secretary. If I may be permitted to do so, I should like to mention another point that forced itself upon me during the meetings and papers I have been privileged to listen to, during the last twelve months in particular. I have noticed interruptions caused by the traffic in the roadway outside. That noise has been very pronounced at times. It seems unusually quiet to-night, but I can assure you that when sitting by the far window it is almost impossible to catch the words of the speaker on the platform, and I beg to suggest to the Council that they consider the question of deadening the sound by some means, such as having a double window.

CHAIRMAN: That question has already been raised at the Council meetings.

Mr. MARTLEW: But the double windows are not there, and that is why I have spoken about it.

Mr. J. R. RUTHVEN: I should like to say a word about Mr. Adamson. I suppose I am the oldest member associated with him; we were practically boys together when he first came to London. Mr. Leslie has brought forward the question of paying him, but you cannot pay him for what he has done; the work he has done is beyond our payment. I propose that the least we can do is to offer him a minimum salary of £500 a year, and I hope the Council will consider that as a basis, because you cannot pay him what he is worth.

Mr. J. SHANKS: As a Vice-President for two years and as a member of Council for the last two years, and a regular attender at the Council meetings, I have been in close touch with the work of the Institute, and one thing that has been impressed upon me is that there was something lacking for want of a paid Secretary, and it was apparent to everyone that this question was bound to be brought forward. It has pained me to see Mr. Adamson working as he has done during the war without remuneration. I am pleased that Mr. Mather explained to the members here to-night that what is shown in the accounts in connection with payments to Mr. Adamson is not salary; it is simply out-of-pocket expenses. I am very pleased also that Mr. Leslie has brought the subject forward to-night. I understand that it is a suggestion to go before the Council, and I am sure that it will receive their sympathetic support. Mr. McLaren and Mr. Robertson have spoken in very emphatic language on the subject of a sinking fund. During the past

year the Council have seriously considered this question, not once or twice, but meeting after meeting, and I am sorry to say we could not come to a united decision. That is the sole reason why nothing has been done, and Mr. McLaren and Mr. Robertson are aware of that fact. It still resolves itself into a question for the Council to decide. Of course, I have my own opinion on the subject as well as those who have spoken. In the meantime, we are not losing anything by investing the money as we are doing. The question of the appointment of trustees is a new one to me, and it is one the Council will have to consider. The Council have no continuous control over the money; it does not matter how you invest it, and that is a very important matter. Again, I would like to thank Mr. Leslie and Mr. Thom for bringing forward the question of a paid Secretary, and I am sure that we could get no one better than Mr. Adamson. Apart from his work for the Institute, if anyone wants to get a lad into the Royal Caledonian Asylum or the Infant Orphan Asylum, Mr. Adamson is always ready to assist, and it is that sympathetic work Mr. Adamson is doing that makes of twofold value the work of the Institute.

CHAIRMAN: I am sure we may take it from the manner in which this proposal has been received that we are quite unanimous. Unless I have already ceased to be a member of the Council, I propose to attend the meeting next week, and I will explain that, after a full and lengthy discussion, we are unanimously of opinion that Mr. Adamson should be paid a salary as Secretary, and we can reasonably ask that Mr. Adamson shall receive a fair remuneration. There are very few here to-night, except Mr. Adamson, Mr. Leslie and Mr. Ruthven, who were present when this Institute was formed. Mr. Adamson presided at the birth and nursed the child through its infancy and youth until it arrived at the stature of a man. It was a labour of love; but still you would not find many who would go on so long without remuneration, and it is highly unreasonable for the present system to continue. It is not fair for the Institute to ask Mr. Adamson to give so much of his time to the work of the Institute under the present conditions, and I propose, as Chairman of Council, to say at the next meeting of Council that I am authorised by this meeting to convey to the Council the unanimous desire that immediate steps be taken to remedy this absurd condition of things. I think I may take it from you that that is your wish.

The proposal was carried unanimously and with acclamation.

Mr. FARENDEEN: If not too late I should like to support Mr. Robertson's proposition with regard to a scheme of redemption. It should be taken in hand, and I consider it is the right thing to do. I think the matter should be brought before the Council again at the first opportunity.

Mr. MATHER: I should like to make a remark on the subject of Mr. Adamson's appointment as paid Secretary. I am entirely in sympathy with Mr. Leslie's proposal, and I am glad to see that it has had a remarkably unanimous response. I am glad to say that the finances of the Institute could not be in a better position. I have been accused of hoarding, but if any hoarding exists it is because conditions have been such that hoarding has been possible for use in the practical development of the Institute and for some such purpose as has been suggested to-night. I am very pleased to see that the matter of a sinking fund has again been brought up. The figures are available at any time. The matter should be looked at in a more important light than that of mere casual investing. There is a great difficulty in re-investing the interest each year so as to let the fund accumulate at compound interest, which is what is necessary. I should like to say that, as Hon. Treasurer of the Institute, I very much welcome the suggestion of appointing trustees. At the foundation of the Institute there were only small sums at stake. To-day there is a large amount to handle, and the responsibility should not be left to the Council or Finance Committee, and, primarily, to the Hon. Treasurer. I think that is a matter which the Council will do well to consider.

Mr. ADAMSON: I should just like to add a word or two. I appreciate very highly the remarks with regard to my services. As has been said, it has been a labour of love to me, and, I would add, a pleasure to labour. I have been very pleased to see the growing steps of the Institute from the days when it was in the cradle till now, when it is able to run on its own. I am deeply moved by the language which has been used with regard to myself, and I am sure you will understand my feelings at the reception of the words spoken by several of the members to-night.

Mr. MATHER: I have pleasure in proposing that we accord a hearty vote of thanks to the President for coming down to-night to take the chair, and also to Mr. Boyle for presiding the remainder of the evening after the President was compelled to leave.

Mr. THOM seconded the proposal, which was carried with applause.

Mr. BOYLE: Thank you very much. It is always a pleasure to me to come here. I have always been of opinion that the work and value and prestige of the Institute will go on more and more, and that the Institute will be looked upon as a centre and rallying point for all the engineers throughout the Empire. Believe me, the tide of marine engineering is coming in, and coming in with a rush. The value of engineers will be appreciated more and more and put to more use. At any rate, we are convinced that it will be.



With regard to the remits from the Annual Meeting to the Council, the following paragraphs are appended to show the course of action which has been taken:—

DOUBLE WINDOWS FOR THE LECTURE HALL TO REDUCE SOUND OF TRAFFIC.—This received consideration soon after we entered the new premises, but it was found necessary to postpone the work till a more favourable time.

APPOINTMENT OF TRUSTEES.—This is receiving attention, and is in the hands of the Finance Committee.

THE HON. SECRETARY.—In accordance with his desire, as expressed in a letter to the Council in Committee, dealing with the subject and the details involved, it was arranged that the Hon. Secretary retain the designation and position he has held since the foundation of the Institute, and in view of the wish expressed by the Annual Meeting, it was unanimously resolved to present him with an honorarium of 150 guineas for the current year, and to be subject to approval from year to year.

Mr. NORMAN S. STEWART, the Assistant Secretary, who was granted leave to enlist in October, 1914, and was invalided out of the Army some months ago, had so far recovered health to resume partial duty in April, placed his resignation before the Council. This was accepted with regret. He has entered upon a remunerative commercial appointment in which we wish him all success. The services of Miss A. Spon, who has been attending to the clerical work since we entered the new premises in 1915, are being retained.



ADDITIONS TO LIBRARY, SESSION 1917-18.

SUBJECT.	PRESENTED BY
Transactions of the Liverpool Engineering Society	The Council of the Society
The Indicator Handbook (C. N. Rickworth)	Mr. James Kelt
Marine Engineers, their Qualifications and Duties (C. G. Constantine)	Do.
The Shipbuilding Industry (G. Pollock)	Do.
Elementary Workshop Arithmetic (H. A. Darling)	Do.
Engineers' Costs and Economical Workshop Production (Dempster Smith and Pickworth)	Do.
A First Year-Book of Engineering Science (P. J. Hailes)	Do.
Elementary Physics for Engineers (Yorke)	Do.
Steamship, Vol. 28	The Editor
Journal, Institute of Metals, No. 1, Vol. 17	The Council of the Institute
Calendar, University College, London	The Senatus
Transactions, Institute of Mechanical Engineers, Jan. to May, 1917	The Council of the Institute
Hints to Sea-going Engineers	Mr. Charles Baxter
Engineer, Bd. Vols. Nos. 120, 121, 122	Purchased
Engineering, Bd. Vols. 100, 101, 102	Do.
The Marine Engineer and Naval Architect, Vol. xxxix	Do.
Transactions of the Institute of Naval Architects	The Council of the Institute
Do. do.	Sir Robert Lyle
The Imperial Japanese Navy (F. T. Jane)	Mr. C. A. Suffield
The British Fleet (F. T. Jane)	Mr. William Ross
Modern Workshop Practice (E. Pull)	Mr. J. Sim
Brown's Arithmetical Guide for Young Engineers (W. T. Thorn)	Do.
Education of Engineers (H. G. Taylor)	Do.
How to Save a Big Ship from Sinking (C. V. A. Eley)	The Author
Ship Calculations (C. H. Hughes)	Donation.

*Reply to the Discussion on "Watertight Doors."

PAPER READ ON SEPT. 11TH, 1917.

I beg to acknowledge receipt of the October, 1917, number of the Transactions, in which appeared my paper on W. T. doors, which you kindly read in my absence. Please accept my hearty thanks and also kindly convey my gratefulness to all the members who took part in the discussion, and who, with their interesting remarks, helped considerably to make my paper more clear. As Mr. W. MacLaren said, discussion is very important to an author, and in this case I feel proud of the fact that my paper led to such interesting discussion.

In these days, when ships are being sunk every day, mostly by such a powerful weapon as the torpedo, it is only natural that any subject dealing with the W. T. sub-division of ships should awaken great interest, and that a wide berth should be given to any fittings which may appear to affect the principle of W.T. sub-division. It is long ago since it was recognised that, it being impossible to give a ship sufficient pumping power to deal even with the water entering through the breach caused by a slight damage, the only means of maintaining a ship afloat after suffering a certain damage was by adequate W.T. sub-division and by giving the ship a certain amount of initial stability to prevent her from capsizing. It is now acknowledged that the unsinkable ship is unfortunately only a myth. The W.T. sub-division can only be carried out to such extent that she may have a sufficient reserve of buoyancy to withstand a moderate damage, which amount has been fixed somewhat arbitrarily. This is so, because the design of a ship, on the whole as well as in detail, is a matter of compromise; a ship could be so minutely sub-divided by means of W.T. partitions that she could be practically unsinkable; but a ship, whether merchant or naval, has certain functions to fulfil, and if sub-divided to such extreme extent she could not be worked, and would be spoiled as a ship: hence the need of a compromise between the limit to which the W.T. sub-division can be carried out and the means for efficiently working the ship. The safety obtained by means of W.T. sub-division is only moderate, as far as it is practicable to use it, and it is obvious that everything should be done to maintain, as efficiently as possible, all the various partitions that form the W.T. compartments of vessels.

* Duplicate, the original having been sent in a steamer which was lost.

Some years ago it was found that a bulkhead pierced by pipes and other fittings, fitted with doors which when open left a large passage through, destroying the watertightness of the bulkhead, was not an efficient partition. The remedy for this defect was found in the solid or intact bulkhead, with no openings leading from one compartment to the other (the only communication being by the top decks), not pierced by pipes or other fittings, which are hence carried up to or above the main deck. This type of bulkhead, provided it is designed strongly enough to resist any moderate buckling or distortion, is, indeed, an ideal one with regard to the safety of the vessel, but it could not be denied that a ship fitted with numerous bulkheads of this type would be a very difficult ship to work. And these difficulties affect precisely the most hard-worked personnel on board—the men down below—and they affect them materially and morally; materially because the act of climbing and descending many times, through nearly vertical iron ladders 30 or more feet high, with hand rails which often get so hot that they cannot be touched, is a very tiring process; and morally, because a man responsible for the efficient working of machines placed in isolated compartments must feel uneasy at the thought that he cannot easily supervise and control the machinery, the performance of which he is held responsible.

Mr. F. O. Beckett has given us a good idea of the troubles which the engineers have to face on board ships fitted with such a type of bulkhead when he mentioned the case of the Second Engineer on board the *Mauretania*. On board warships matters are still worse. Just imagine the position during action of the Engineer-Commander of a battleship fitted, let us say, with three engine-rooms; he would be in the centre compartment, where is the starting platform, and where the L.P. turbines are mounted, also the condensers and their accessories; the H.P. turbines would be in the wing compartments; in other arrangements the condensers and their accessories would also be contained in separate compartments just abaft the engine rooms. The boilers would be distributed in four or more compartments, according to their number. The Engineer-Commander of a battleship is the soul of all the mechanism placed down below; his responsibilities are very great, as he is responsible not only for the speed, a factor which every action in this war has taught us is so important and has such a great influence on the final decision, but of the hydraulic pumps for working the guns, of the air compressors for the torpedoes, of the electric machinery for lighting and other

purposes, etc. All these various machines are also placed in separate compartments. During action they are all at work, but the man responsible for their efficient work is locked up in one compartment, quite unable to supervise them. Under such circumstances, the strain thrust on the nervous system of this officer must be very great, and must tell adversely on his capacity to control so many engines and hundreds of men, who in case of need would not have the advantage of the experience of their chief nor the weight of decision he possesses on account of his high position.

On warships fitted with solid bulkheads electric lifts are fitted, but they cannot be used during action, as all openings are closed up by means of armour gratings. I do not know if in large liners lifts are fitted for the engineers; if they were they would make their work much easier, but even with electric lifts the time taken to inspect all the engines placed in different compartments would be relatively considerable, and in many cases time is an important factor to prevent an accident.

I think that engineers ought to have easy means of communication to get in the quickest possible way to any part of the ship where machinery of certain importance is contained. The want of easy communication must adversely affect the efficient working of the ship, and in many cases it may affect her safety. On the other hand, it is obvious we have to consider the importance of everything that contributes to preserve the buoyancy of a ship. Therefore, the problem we have to solve is to find a mechanism to fulfil both conditions—that is to say, a mechanism that will allow easy communication between the compartments without destroying at any moment the watertightness of the bulkheads or partitions in which it is fitted.

The system of doors described in my paper may be a solution to this problem, as it provides easy communication, because to pass from one compartment to the other it is only necessary to open one door to get into the cell, to shut this door and then to open the other; in the meantime, even when actually passing through, the watertightness of the bulkhead is not destroyed.

During the discussion several objections were raised against the fitting of doors in bulkheads. I think these objections may be the result of experience with single doors, but I cannot think that they may be justly applied to my system of double doors, for the following reasons:—

(1) At least one door is always shut, so that the bulkhead is always watertight. The double interlocking gear prevents both doors being open at the same time.

(2) If the damage to the ship affects the motive power to operate the doors, it does not matter, as far as the watertightness is concerned, as only one door could be left open. The possibility of the motive power being put out of action could be minimised by fitting the supply in duplicate, one lead running along each side of the ship.

(3) The seats of the doors are formed in the ends of a rigid cell whose sides are perpendicular to the bulkhead, the ends being 18 or more inches away from it; fitted in this manner the cell acts as a stiffener, so that any moderate distortion would not impair the tightness of the doors. Of course, if the damage is so serious that the bulkhead gets broken, then the doors are of no use, but in such a case they cannot be blamed.

(4) The interlocking gear is simple; the valves are ordinary valves of small size, not liable to give trouble. To guard them from damage they may be placed inside the cell.

The system would certainly be more compact, and it would occupy less longitudinal space, if fitted as Messrs. F. O. Beckett and S. C. Martlew suggested. I am, indeed, much indebted to these gentlemen for their ideas. My hearty thanks are also due to Mr. Ellis for his suggestion about fitting the cell with a means of communication to a higher level. As the Chairman said, I had thought of fitting the ventilator with a ladder to allow the escape of men from down below to the upper deck.

Mr. Jas. Paterson has advanced the opinion that shipowners would not go to the expense of fitting this system of doors. I think so, too. However, such a policy on the part of shipowners is not to be encouraged; they should be made to realise that "a happy crew makes an efficient ship." The sooner they realise that a few hundred pounds expended in improving the accommodation and in adopting fittings which contribute to make easier the work of the crew is a good investment the better, especially so if the fittings contribute also to the safety of the ship.

In concluding, I take this opportunity of thanking all the members who attended the meeting and gave a kind reception to my paper. I recognise it had many shortcomings, but the interesting remarks of Mr. R. Balfour, chairman on that occasion, and of Messrs. J. Thom and Oliver, filled the gap splendidly. My hearty thanks are due to them.

INSTITUTE OF MARINE ENGINEERS INCORPORATED.

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Session 1917-1918.

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CAPTAIN R. H. GREEN, R.D.C.

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- 1906-7 THE RIGHT HON. LORD PIRRIE, K.P., P.C.
- 1907-8 SIR JAS. KNOTT, J.P.
- 1908-9 JAS. DENNY, Esq., J.P.
- 1909-10 JAS. DIXON, Esq. (died July, 1909).
- 1909-10 JAS. DENNY, Esq. (from August, 1909).
- 1910-11 SIR DAVID GILL, K.C.B., F.R.S., D.Sc.
- 1911-12 THE MOST HON. THE MARQUIS OF GRAHAM, C.B., G.V.O.
- 1912-13 SUMMERS HUNTER, Esq., C.B.E.
- 1913-14 SIR THOS. L. DEVITT.
- 1914-15-16 SIR ARCH. DENNY, BART., LL.D.
- 1917-18 SIR JAS. MILLS, K.C.M.G.

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