CONFIDENTIAL BULLETIN FOR THE USE OF MEMBERS

THE

HOSPITAL ENGINEER

NEWS LETTER

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No. 2

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Hon Editor : R. G. Rogers, "Elmfield," Stone, Aylesbury, Bucks.

Issued DECEMBER 1945

EDITORIAL.

THE item of news which must be given pride of place in this No. 2 issue of the "Newsletter" is that the delegation appointed by your Council, charged with the task of endeavouring to set up a Joint Conciliation Committee between the Mental Hospitals Association and the I.H.E. have at last achieved their object, and this J.C.C. held it's first meeting at the Bonnington Hotel, Southampton Row, London, on Thursday, October 18th, 1945.

Our first meeting with the M.H.A. was on June 4th, 1944, when a delegation consisting of Mr. J. Hargreaves, Kent County Hospital, Mr. R. G. Rogers, Bucks Mental Hospital and Mr. G. Jones, Hensol Castle, met the Executive Committee of The M.H.A. at the Holborn Restaurant to state a case for the I.H.E., with the request that a J.C.C. be set up between the two bodies. After much discussion, the M.H.A. resolved, that, as we were a new organisation and may not yet be fully representative of Engineers in Mental Hospitals, that our application should be deferred for a period of 12 months. Being a little impatient, maybe, and in the belief that the establishment of such a J.C.C. would be to the mutual advantage of both bodies, we again approached the M.H.A. before the expiry of the 12 months.

This time the delegation consisted of the same members of the I.H.E. with the addition of Mr. R. E. Rogers, Cardiff, Hon. General Secretary. A meeting was therefore held at the Holborn Restaurant on April 25th, 1945, at the conclusion of which, the Chairman of the M.H.A., Alderman J. Hollins, M.P., informed the delegation that the Committee had decided to recommend to the M.H.A. Executive Committee that a J.C.C. be set up between the M.H.A. and the I.H.E.

That recommendation has now been implemented, and was officially ratified on the 18th October, 1945, on the occasion of the first meeting between the two bodies as a J.C.C., when the constitution was agreed upon and signed by the Chairman of each body.

The I.H.E. representatives at this meeting were Messrs. J. Hargreaves, Kent; R. G. Rogers, Bucks Mental Hospital; W. Bullivant, Oxford Mental Hospital; G. Jones, Hensol Castle; J. Tivey, Park Prewett; H. A. Adams, Bristol; H. Clarke, Gateshead; A. A. Braine, Winnick; A. Mansell, Meanswood Park; and R. E. Rogers, Cardiff, Hon. Secretary.

The matters discussed were, (a) Training; (b) Qualifications; (c) Status of Hospital Engineers and their Assistants. We were able to discuss these subjects at great length, and were listened to very attentively. Later in the Meeting, Salaries and Conditions of service were discussed, and at the suggestion of the M.H.A. a small sub-Committee of 4 on each side was appointed to work out the details concerning these matters. The representatives of the I.H.E. on this sub-Committee are Messrs. J. Hargreaves, R. E. Rogers, R. G. Rogers and W. Bullivant, and this Committee held its first meeting on 5th November, 1945.

With regard to the British Hospitals Association, I regret to say that so far we have not been able to get this authority to grant us an interview with the object of establishing a similar Joint Conciliation Committee on the General Hospitals side, but we are hoping that the matter will receive the consideration of the B.H.A. in the near future.

It was quite a pleasure to meet so many of our colleagues at the A.G.M. at Southport on the 8th September, when 69 members attended the meeting. All those with whom I talked seemed very pleased with all that they saw and heard, and considered it a very successful meeting. I do not intend to deal with it here as my colleague and namesake, the Hon. General Secretary will be submitting a full report later. I would just like to express our appreciation of the way in which we were treated by the authorities at Southport, and record our thanks for the use of the Victoria Hall for our meeting. This was put at the disposal of the Institution for the afternoon, free of charge. . .

Many of our members spent the week at Southport, and thus combined business with pleasure. It was unfortunate that a fire broke out at the Scarisbrick Hotel, where wooms had been booked for members of the Institutuon, on Saturday prior to the A.G.M.

This greatly increased the work of our colleague, Mr. Oliver, who was responsible for the arrangements for the meeting, and who, perforce, had to dash around at the last minute trying to find alternative accommodation, not an easy task in a popular holiday resort such as Southport.

Apropos the Article, "Send for the Engineer," a reprint of which appeared in "Newsletter" No. 1. I have received many adverse comments regarding this, one of which you will find printed elsewhere in this issue. All the others have been verbal, but all are in the same strain, and seeing that I, as Editor, accept responsibility for reprinting it. I feel I must reply to these criticisms. 1 would say in the first place that the critics are taking the article all too literally. One has to picture a patient laying in bed in a Hospital during the Summer of 1942 ward noticing the little everyday things that are going on around him, and what has been written is, I suggest, what normally happens. The reference to the "Engineer," I do not take to mean the "Chief Engineer," nor does the writer of the article mean this, presumably, or reference would not be made to "the tall one who knows a lot about Radio." Obviously, the article refers to the Engineering Staff and not the Chief Engineer specifically, although if the Hospital in question was a small one. it is unlikely that a member of the engineering staff would be on duty at all hours. While it is not suggested by the writer, for one moment, that the Chief Engineer should normally do work of the

nature described, particularly in peace time, I must confess that during the War I have found myself confronted with each of these problems except two, viz. (1) being called out to catch a mouse, (2) to fish a patient out of a drain), and seeing that "necessity knows no law," and none of my Staff were available. I did it personally, and so would you have done, my reader. As for lowering the status of the "Engineer" (or more correctly, I suggest, the Engineering Staff, in this case), I think the writer of the article has, in all sincerity, tried to illustrate the paramount importance of the "Hospital Engineer's" work, and has supplied ample evidence of the need for the Engineering Staffs in Hospitals to be sufficiently large to permit of a 24 hours service being maintained, in order to deal with any emergency which may arise, in the Engineering Departments.

Editor.

THE CAUSES OF EXPLOSIONS AND FIRES IN OPERATING THEATRES.

Short Paper read at the meeting of The Institution of Hospital Engineers (London Branch) on Saturday, 10th February, 1945, at King's College Hospital, by

J. TOMLINSON, Esq., Chief Engineer and Clerk of Works, King's College Hospital.

THE object of this paper is to explain as concisely as possible in the time at my disposal, the causes of explosions and fires in the Operating Theatres of Hospitals. I have no doubt that we all have some knowledge or experience or both of fires and explosions in Operating Theatres, and the ever present possibility of such an occurrence is one that cannot be lightly dismissed by the Hospital Engineer. It is pleasing to know that the number of serious accidents due to explosions in Operating Theatres has, so far, been small, I refer of course to accidents in this country.

What caused the explosion or fire? and can it be avoided? I think these are the two most important questions to ask. The answer to the first part is, we must assume that a spark of some kind ignited gases of an explosive nature. The answer to the second is, in the main, Yes. You may then wish to ask what are the explosive gases and whence came the spark? The first is, I think easily answered; the gases are without doubt, those used in general Anaesthesia which when mixed with air form highly

dangerous mixtures. I would refer you, at this point, to the circular issued by the Ministry of Health, Circ. MED/MEMO. 191. The anaesthetics mentioned there are as follows :--

- (A) ETHER-AIR AND ETHER-OXYGEN, a rich etheroxygen mixture being more dangerous than an etherair mixture.
- (B) NITROUS-OXIDE ; although this gas is not itself inflamable, mixtures of other vapour with air or oxygen are made more inflamable if Nitrous Oxide is present.
- (C) ETHYL-CHLORIDE; This yields a vapour which becomes explosive when mixed with air.
- (D) A.C.E. The ordinary A.C.E. mixture may yield an explosive mixture also.
- (E) ETHYLENE-OXYGEN; with this mixture the explosion resulting from ignition is exceedingly destructive.

The second part of the question is much more complex and one that requires much more study, but the answer is just as definite as the first part, I will repeat it, "From whence came the spark?" Our experience of Theatres at once supplies a number of points at which we might easily put our finger on a cause, but some of the causes are much more insidious. Sparks may be created between the contacts of switches, the brush gear of motors, the electrodes of diathermy apparatus, speed regulators, X-Ray apparatus, bad contacts on plug connections, faulty leads, etc., etc. Remedies will immediately spring to the mind of many of you to correct the faults I have outlined, but the final danger with which I propose to deal more fully, is the spark resulting from a discharge between two bodies at different potential, or would it be better to say at different electrical condition.

How is this condition created? Static electricity can be created by friction and stored in articles or objects for some time, having regard to the conditions prevailing. But when touched by another object or body at different potential or condition, a surge of the electrons will pass from the more highly charged atoms to the atoms not so highly charged. If the charge be a large one, the surge will be strong enough to jump a small air gap between the two object and this can be seen under favourable conditions

as a small spark. Here I would mention that the ability to hold the charge is dependent upon the condition of the atmosphere and upon adequate insulation bewteen the article and "earth," or other object. The question of the degree of humidification is very important, as modern methods of air conditioning tend to give us a much dryer air in our operating theatres. In America, where the climate is much dryer, the risk is much greater. To return to the static charge, I will endeavour to explain how this is created and what it is. I have already mentioned the surge of electrons which may pass between two articles of different electrical condition, the difference being created by friction. If one takes a stick of sealing wax and rubs it on flannel, electrons from the atomic structure of the flannel will pass into the atoms of the sealing wax, thus giving the sealing wax an excess of electrons while the flannel develops a deficiency. To prove this we find that the sealing wax will attract light objects such as fragments of paper and if the sealing wax be brought sufficiently near, the paper will fly to it, but after contact for some time, the paper will drop off, the reason being, that after contact and the subsequent surge, the two bodies become balanced in condition and attraction ceases.

I trust you will excuse this lapse into the elementary, but I have resuscitated the experiment to illustrate "Frictional electricity" or the static charge. We see, therefore, how easy it is to create a static charge in an insulated body and if our objects are increased in size, the surge of electrons can be seen passing from one object to the other in the form of a spark. Such sparks can be created in the operating theatre upwards of a quarter of an inch. It will, therefore, be seen that given an explosive atmosphere and a hot spark an explosion is bound to occur. How best can we guard against this dangerous state of affairs? If we take two objects at different electrical potential or condition and connect them together by an electrical conductor, electrons will flow from one to the other until a balanced state exists actually this flow of electrons will only continue for a fraction of a second, probably in the nature of 1/50,000.

It will, therefore, be seen that the best way to eliminate sparks from the various objects and apparatus in use in the operating theatres is to keep them at common potential, an easy and positive method would be to connect them all together with lengths of cable, but as this method might not be accepted by the theatre staff another solution must be found. During some experimental work I did in this sphere some fifteen years ago, I found that a brass or copper chain firmly screwed to all the various objects such as

trolleys, etc., in use in the theatre, and of sufficient length to allow trailing contect with the floor, gave admirable results. In the particular theatre I carried out these experiments, a mysterious fire had occurred.

Before closing, I would like to menion that there are several other causes of fire in operating theatres, which may have been called to your minds. I do not lose sight of the fact that it is not unknown for surgeons to smoke in the operating theatre, not during a case of course, but during the time the Nursing staff are using ether rather lavishly, in their cleaning efforts. To some of you this may appear appalling, it is; but as I say, it is not unknown and I am happy in the belief that it is exceptional. Adequate ventilation must, therefore, play a big part in the safe working of our theatres, for, if the explosive gases are removed as rapidly as they are given off from the apparatus or the patient, the danger is considerably reduced.

Also it is well to remember that the danger of ignition is not so great when small low voltage cells are used to supply the multitude of 'oscopes used in the theatre, the common values of these being in the region of 2.5, 2.7 and 3.5 volts. We find the modern trend is to cut out these low voltage cells (the reason is too obvious for mention) and use motor generators or transformers in their stead; I fear I am guilty of this myself. There is grave risk of sparking and shock introduced by the arrangement of a surgical lamp with a regulating resistance connected directly to the supply mains. Another point to remember is that ether vapour will ignite by contact with hot metal at a temperature of 300 to 350 degrees C., which is below that of visible red heat.

So many questions and difficult points are involved in a subject of this kind that when starting to write this paper I doubted the possibility of getting the several salient features of the subject matter in in the short time at my disposal, but if what you have heard in this short time has whetted your appetite for more, then I am very satisfied, and probably a fuller paper can be forthcoming at a later date.

ANNOUNCEMENTS.

A "Vacancies" Register has now been set up by the Council of the Institution for the benefit of members who wish to be notified of vacant posts as they occur. Any member, or associate member, wishing to receive this information should write to :--

W. Bullivant, Esq.,

Chief Engineer & Clerk of Works, Oxford Mental Hospital,

Littlemore, Oxon.

stating details as to the kind of vacancies in which they are interested—whether Engineering only is desired, or dual appointment, as Engineer and Clerk of Works, or any other details such as minimum salary required, etc. etc.

Editor.

Questionnaire.

If you have completed this and sent it to the address stated, Thank you.

If you have not done so, please do so NOW.

If you have mislaid it ask your Branch Secretary for another. To Associate Members.

If your Chief has already completed a form, it is only necessary for you to complete the "Personal section" writing boldly across the other part "completed by Chief Engineer."

Subscriptions.

There are still a few subscriptions outstanding which the Hon. Secretary will be pleased to receive and acknowledge, so please send them along right away so that he may close his books. He has a heavy job on hand and I am sure you would not wish to burden him unduly. This is one of the ways in which you can help. Thank you.

I have received a suggestion from Mr. Tivey, of the Southern Branch, asking that the names and address of all Branch Chairmen and Secretaries be published in the next issue of the Newsletter.

The idea is, that if and when members of the Institution happen to be travelling around they may call on their colleagues.

So there you are, Mr. Chairman and Secretary, it is up to you to disclose your whereabouts If you would like this done please send full details to the Editor and they will be published.

BRANCH NEWS.

HISTORY OF THE LONDON BRANCH.

The inaugural meeting of the London Branch of the Institution was held at the Westminster Hospital, Horseferry Road, London, on the 5th February, 1944. A. M. Jones, Esq., occupied the chair, supported by Messrs. R. G. Rogers, G. A. Quenet, and H. Wright, members of the Council.

There were fifteen members present including associate members, this being practically the whole of the Branch membership, but what the meeting lacked in numbers was certainly compensated for by the keen enthusiasm displayed by all.

It was agreed for the time being that Essex, Middlesex, Kent, Surrey, Sussex, Isle of Wight, Hampshire and Bucks form one Branch, holding joint meetings in London, this arrangement applied until January, 1945, when Sussex, Surrey, Isle of Wight and Hampshire formed the Southern Branch.

Monthly meetings were held, these meetings were open to prospective candidates, and in May, 1944, the Branch settled down to serious business.

A deputation of the Branch was invited and attended a meeting of the L.C.C. Staff Association, Engineers section, at the County Hall, London, on the 14th June, 1944, where we were very cordially received.

At the June meeting, 1944, the Branch recommended to the Council that an examination sub-committee be appointed; this was favourably received and a sub-committee was duly formed.

Following the Council meeting held 30th September, 1944, a sub-committee met in London to discuss the proposed salary scale, which after due consideration was submitted at the Annual General Meeting, 1944.

Some very interesting papers have been read before the Branch, four of which were contributed by members, these papers were received with enthusiasm, and contributed to some very lengthy discussions.

By December, 1944, the London Branch had made great strides, the membership had increased to eighty, and attendances to Branch meetings were in the region of fifty, enabling the members to discuss fully their various problems.

At the Annual General Meeting held at Nottingham on 8th December, 1944, the London Branch was well represented, all Branch officers attending, and a fair number of metnbers and associate members.

All meetings of the London Branch have been held at the Westminster Hospital, with the exception of the February meeting 1945, when, by kind permission of the Kings College Hospital Board of Governors (arranged for by J. Tomlinson, Esq., Chairman of the Branch) we visited and held our meeting at Kings College Hospital, forty two members were present, and all enjoyed a very interesting afternoon.

At the May meeting, 1945, the Branch were honoured with a visit by members of the Southern Branch, and some very interesting discussions took place. At this meeting it was decided to arrange periodical joint meetings for all the Branches in the South.

Sub-committees have been appointed to deal with Technical talks and visits to Hospitals and Works. Salary scale and Journal. reports have been submitted to the Branch from these Committees.

The membership in the London Branch is now ninety eight. We want to see every member and associate member at the Branch meetings, taking part in the discussions, and giving their wholehearted co-operation and support to the Institution.

We feel sure all members of the London Branch will join us in thanking the Chairman, Vice-Chairman, Hon. Secretary, Treasurer and all members of the Council, for their efforts on our behalf, and will wish to congratulate them on their success so far achieved in negotiating the interests of the Institution through the very difficult period now happily passed.

We also look forward in the near future, to not only thanking them, but to congratulating them on the results obtained.

Yours faithfully.

C. A. OUENET, Fairfield. Barley Lane.

Goodmayes, Essex.

H. WRIGHT. Whipps Cross Hospital, Levtonstone, London, E.11.

Hon. Joint Secretaries, London Branch.

SCOTTISH BRANCH.

It was indeed gratitying to see such a large turn out of memers at our first outing on 8th October, 1945. On the invitation of Mr. W. H. Cawthorn, General Manager of Laundries for Scottish Co-operative Wholesale Society, the party left Glasgow by special bus at 10 a.m. and proceeded to Grangemouth to inspect the laundry. On arrival we were met by Mr. Cawthorn. The party divided into four groups, and proceeded to tour this excellent Laundry.

Opportunity was taken of this visit to meet Mr. MacKenzie, of Perth, and Mr. Cuthbertson, of Dunfermline, who were introduced to the company.

The classification and timing required in an establishment of this size is of vital importance and some very interesting data on this subject was given by Mr. Cawthorn. Everything seemed to run so smoothly and I am sure all of us present were greatly impressed. The battery of steam presses was another feature well worthy of noting, the layout leaving nothing to be desired.

The paddle type of washing machine is used here for flannels and woollens. This type of machine should be given careful consideration by the Governing Bodies of Hospitals. A great saving in wear and tear, less shrinkage or articles, and a saving in soap would take place if this type of machine was used for flannel and woollen articles instead of the rotary type. The party later adjourned to the well-equipped laundry canteen for lunch.

After a splendid lunch Mr. Cawthorn read an excellent paper on Laundry Troubles which was most instructive and thoroughly enjoyed by everyone present.

Ample opportunity was given for questions, there being very many, after which this part of the programme was closed by a hearty vote of thanks to Mr. Cawthorn for all he had done for us.

In the absence of Mr. Perry, Manager of the Soap Works, Mr. Intin, Assistant Manager, now took charge of our party and we proceeded by bus to the Soap Works. On arrival the party divided into two groups and we were shown through this very interesting factory, the largest of its kind in Scotland. To a large number of us present the various processes and mixing of the various oils, etc., was very complicated, but most interesting. Mr. Intin and Mr. Summers were very painstaking in their explanations, and some of the difficulties of solving the mysteries were overcome. The time at our disposal was all too short.

After being entertained to tea by the Management, questions were asked, which were answered by Mr. Intin and Mr. Summers, in their very explicit and breezy style, after which a hearvy vote of thanks was accorded to these two gentlemen for their kindness.

The party then left for Glasgow after having spent a most educative, instructive and sociable day.

J. CRAIG, Branch Secretary.

SOUTH WALES BRANCH.

By the courtesy of The General Electric Company our branch meetings are held at the company's magnificent new building in Kingsway, Cardiff, and we wish to record our appreciation and thanks to Mr. Duce, the District Manager, and his staff for the cordial manner in which we are always received.

Our meetings are held on Saturday afternoons and we are always met by Mr. J. Williams, the Asst. Manager and one of his staff, who are always ready to assist us in every way possible.

At one of these meetings Mr. A. F. Morgan, the G.E.C. district Engineer, gave a lecture and demonstration on Electrode Boiler Heating Systems. On another oaccasion Mr. Williams and Mr. James, of the G.E.C., demonstrated the uses of the 5th Fluorescent tube and its application to Operating Theatres.

A very interesting paper entitled "Refrigeration and Air Conditioning" was read at one Branch meeting by Mr. R. E. Rogers, out hon. general secretary, and it is hoped that this paper will be submitted for publication in the "Newsletter" at an early date.

We suggest that it might be possible for other branches to solve their difficulties of finding suitable accommodation for holding branch meetings in a similar manner to that of South Wales, which we find most interesting and economical.

G. JONES, Branch Secretary.

NORTHERN BRANCH.

Mr. O. Ritchie has been appointed as Chief Engineer at the Harton Institution, South Shields, in succession to our late colleague Mr. Rees. Mr. Ritchie, to whom we extend our congratulations and good wishes, was previously deputy to Mr. Rees. J. CARR, Branch Secretary.

MIDLAND BRANCH.

The Editor has received the following letter from the above Branch.

Dear Mr. Rogers,

I have been requested by the Midland Branch to convey the following resolutions to the Journal Committee.

(1) It is the desire of the Midland Branch to convey its congratulations to all those who have worked and successfully issued the first issue of the "Newsletter," and express their thanks and appreciation. (2) The item in the "Newsletter" which was a reproduction from "Answers" on "Send for the Engineer," does not tend to put forward the status of a Chief or Assistant Engineer, to the standard so desired by the Institution of Hospital Engineers. The Midland Branch hopes that no article lowering our status should be issued in any further journals.

With best wishes,

Yours sincerely,

F. H. MILLS, Branch Secretary.

Note: The Editor thanks the Midland Branch for the congratulations and criticisms, both of which are welcome and accepted in the spirit in which they were written. A reply to the latter is contained in the Editorial of this issue.—EDITOR.

SOUTHERN BRANCH.

A branch meeting was held at Southampton on October 20th, 1945, when the following officers were elected : Chairman, J. Forsyth; Hon. Secretary, F. J. Tivey; Committee, Messrs. J. C. Chynoweth, F. J. Howling and R. Welby.

Reports were given on the Annual General Meeting, on the joint meeting with the London Branch, and on the Joint Conciliation Committee with the Mental Hospitals Association.

It was resolved to arrange a visit to The Pirelli Cable Works in the near future and to extend an invitation to the members of the London Branch on the occasion of this visit, which would have to be made on an ordinary week-day.

Tea was very kindly provided for the members by the South Hants Hospital authorities to whom we wish to extend our thanks and appreciation.

The Committee wish to extend an invitation to any of their colleagues to pay them a visit when in the area, and would also welcome them at Branch Meetings. If you are contemplating paying a visit please communicate with :--

F. J. TIVEY, The Lodge, Park Prewett, Basingstoke.

FREER & HAYTER, Printers, Easton Street, High Wycombe

