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Editorial

EVIDENCE was given at an inquest at the beginning of this month, and reported in the national press, concerning the death of a patient due to electric shock arising from the use of apparatus. This should serve to emphasise, once again, the unsatisfactory situation that exists generally within the Hospital Service here whereby electrical apparatus can be introduced for use on patients without proper safeguards being taken as to its intrinsic safety. It was stated in evidence that the machine, a cardiac defillibrator being used in conjunction with a diathermy machine, was in use for the first time and that there were three things wrongs with it. The casing was not earthed, there was a broken wire within it and a wire was connected to a wrong terminal.

Our subsequent enquiries have established that the broken wire had become disconnected due to a badly soldered joint within the cardiac defillibrator and this had touched the casing, resulting in a direct earthing through the patient via the earth electrode of the diathermy apparatus. The Engineering Department of the hospital in which the accident happened had no knowledge whatever that the apparatus was being used; it had been introduced by one of the surgeons concerned.

The Preface and Summary of the Safety Code set out as an appendix to the "Report of a Working Party on Anæsthetic Explosions including Safety Code for Equipment and Installations"* gives consideration to the prevention of burns and shock when surgical diathermy apparatus is used. Clause 22 of the Code requires all exposed metalwork to be adequately "earthed" and Clauses 31 and 50 give details of this and of the tests to be made to ensure that this is effective. Furthermore, the Engineering Department of the Ministry, when called upon, give the strongest support regarding such aspects of safety.

It is certain that, had the apparatus referred to been tested by a competent engineer in accordance with the Safety Code, the accident would not have occurred.

It is a practice far too common in hospitals for doctors, pharmacists and supplies officers to purchase or have repaired electrical equipment of many kinds without any reference being made to the engineering department, and it is more by good fortune than good management that far more accidents do not occur. A code of practice is virtually valueless if "honoured in the abeyance" and the Minister should insist that engineering departments are enabled to discharge this kind of responsibility properly without let or hindrance. Only thus can such accidents be avoided, and most of them are avoidable.

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*H.M.S.O. Price 2s. 6d.

Some Aspects of Radiation Protection in Connection with the Medical Application of Isotopes

By Ir. J. J. ARLMAN

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Introduction

NOW that the field of the medical application of radioactive isotopes is continually growing, so that in most hospitals one can no longer speak of their incidental use, extra care must be devoted to radiation protection. The regular handling of radioactive isotopes, even when their activities are low, can lead to an undesirable accumulation of the radiation dose. If the history of the tolerance dose is studied, it will be noticed that since 1925—the year in which Mutscheller introduced this concept and estimated this dose at about 200 mr. per day—there has been a tendency of decreasing the tolerance dose.

In accordance with the present recommendations care has to be taken that the weekly dose is limited to 300 mr., i.e. an average of 50 mr. per working day. It will probably not be long before the internationally accepted dose is reduced from 300 mr. per week to 5 r. per year.

The purpose has always been to interpret the tolerance dose as the utter maximum for regular irridiation. Even though, in practice, one remains below the tolerance dose, a sense of responsibility is demonstrated by attempts to remain even further below this value, by improvements in the apparatus and the working method.

In how far these improvements justify the costs connected therewith is a problem that will have to be solved by practical experience. Furthermore, the harm done by radioactive radiation is not the same for all parts of the body. Damage is caused especially to young and rapidly multiplying cells, e.g. gonads, blood-producing organs and the skin, rather than to cells in the extremities such as hands and feet. In particular on account of the great differentiation of the genital cells and their importance for future generations, the genitalia should be exposed to as small a radiation dose as possible. This becomes all the more important the larger the size of the population group in question. There is no absolutely permissible dose. A radiation threshold value, below which no damage is done while its exceeding is certainly dangerous, has neither been established nor generally accepted. Furthermore, radiation damage shows properties of a cumulative kind.

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Recording the dose received by the employees in the exercise of their work is for this reason a necessity for assessing the safety both of the worker and of the installation.

From what has been said it is obvious that continuous watchfulness by and for the workers is demanded even though at present and quite incidentally only small quantities of radioactive materials are handled. Improvements in the apparatus and the working method deserve full attention, the more so as it appears in practice that in the course of time the quantities of radioactive materials handled will increase. As far as the safety regulations are concerned these have to become more stringent with, or better still to be ahead of, the ever growing range of applications of radioactive isotopes. Radio-isotopes are imported into many countries and reach them by air. In other countries the consignments also frequently leave the production centres by air and arrive at the airport nearest to the customer. In the case of other customers the radio-isotopes arrive by rail at the local station. The handling of the consignments, whether at the railway station or at the airport, shows very little difference in practice.

Below we shall follow the isotopes consigned to hospitals, from their arrival at the airport or station to the disposal of radioactive waste and shall consider the precautionary measures to be adopted.

We are thinking here in particular of consignments of ^{131}I, ^{32}P and ^{198}Au, which are the radio-isotopes most generally used in medical centres.

Arrival and collection of consignments of isotopes

Usually the consignment of isotopes is collected from the airport or the station by a forwarding agent, or by the customer or his employees.

In the case of air-freight consignments the special air-freight label is inscribed with the number of units, i.e. the number of mr. per hour at a distance of 1 m. from the centre of the packing. Philips-Duphar in the case of all other consignments also insert the number of units, and this will always be found on the address label.

The sender of the consignment has taken care that the dose rate at a distance of 1 m. from the centre or the outside of the packing does not exceed a maximum of 10 mr. per hour, while at the same time

the dose rate at the surface of the packing does not exceed 200 mr. per hour, so as to comply with the demands of the forwarding agents and of the law. The supplier can comply with these demands by a correct choice of the external dimensions of the parcel and, in the case of gamma-ray emitters, by the use of a sufficiently thick lead screening inside the parcel. When consigning beta-ray emitters, lead screening should in general not be used as the dose rate would normally not be reduced but on the contrary increased as a result of the " Bremsstrahlung." Cellulose, blotting paper, etc., should in such cases be used as screening material. These substances consist mainly of carbon and hydrogen, so that the occurrence of " Bremsstrahlung " is reduced to a minimum; this radiation can never be prevented completely but at least it will have such a small penetrating power that the packing material itself will absorb the greater part of it.

Let it now be assumed that the consignment has exactly 10 units; on this the following data are based. The times required for the carrying out of the various manipulations described in this article have intentionally been slightly exaggerated. Each manipulation can be carried out very deliberately, thus reducing the chances of mistakes, waste or other blunders. The doses mentioned below are therefore *maxima*. In the first place they give an idea of those points in the handling of radio-isotopes where radiation protection gives the most important results.

A consignment of 10 units can consist of several parcels, in which case the sum of the units marked on the various parcels amounts to 10.

The time generally required for moving a parcel from the sheds of an airport or station to the waiting car is about 1 to 2 minutes. If no special precautions are taken, then during this movement the doses received by the person collecting the consignment and placing it in the car should amount to 3–6 mr. It is here assumed that the consignee carries each parcel pressed against his chest for one to two minutes.

The consignee/driver places the parcels as far away as possible from his seat in the car. With a normal passenger car or a small delivery van this distance will amount to some 1·5 m.

In the Netherlands the car must be provided with a sign: " WARNING! This vehicle contains parcels with radioactive materials. These parcels can be handled safely if the packing is undamaged. In case of accidents the Chief Pharmaceutic Inspectorate of Public Health must be advised immediately. Telephone number: The Hague 512521."

The time required for the transport from the airport or station to the hospital concerned will in general vary between 0·5 hour and 1·5 hours. The dose received during this transport will amount to 2–7 mr. for a consignment of 10 units.

The unloading and transporting to the place of destination in the building will in general be carried out by the driver and take about 1–2 minutes per parcel, so that the possible dose received will amount to 3–6 mr. In this way the total dose for the driver with a consignment of 10 units will total 8–19 mr. It therefore follows that the driver should be considered for inclusion in the film badge service, so that the radiation dose can be checked regularly and suitable measures can be adopted in time, for example when the number of consignments increase.

The dose can be reduced if, for the movement of a parcel to and from the car, the driver makes use of a trolley or isotope carrier, and if during the transport the car permits of the placing of the consignment at a distance of 2·5 m. from the driver. Under these conditions the dose for a consignment of 10 units will vary between 1 and 3 mr. About 75 per cent of this is received during the ride. In practice it is rare for separate parcels to exceed three units and it is highly exceptional for a consignment for one consignee to exceed 5 parcels. In most cases the consignment will therefore not have 10 but between 1 and 5 units, so that the average dose per consignment for the driver need to exceed 0·5–1·5 mr.

Storage and opening of the consignment

There must be a room in the hospital where consignments can be deposited without difficulty upon their arrival. If possible, the position of this room with respect to the measuring room should be so chosen that the new consignments, while being brought in, do not come near to this measuring room. Otherwise valuable measurements might be interfered with. In general this store room should also contain a safe for the storage of radioactive materials.

The unpacking of the consignment is carried out only by experienced staff of the Isotope Department of the hospital.

Consignments of ^{131}I, ^{198}Au and ^{32}P are at present generally packed in stiff cardboard tubes, or light wooden boxes (Fig. 1). The opening of such a packing requires between 0·5 minute and 1 minute. The maximum dose on the hand with a consignment of 10 units thus amounts to about 1·5–3·5 mr., the dose received by the body being smaller by a factor of 4.

The inner packing of a parcel consists of a hermetically sealed tin with a diameter which varies between 8 and 12 cm. At the surface of this tin the dose rate amounts to a maximum of 3 000 to 6,500 mr. per hour, depending on the diameter of the tin. This high dose rate occurs when the consignment consists of one parcel of 10 units. For one parcel out of this consignment with, for example, 1 unit the dose rate at the surface of the tin will amount to between 300 and 650 mr. per hour.

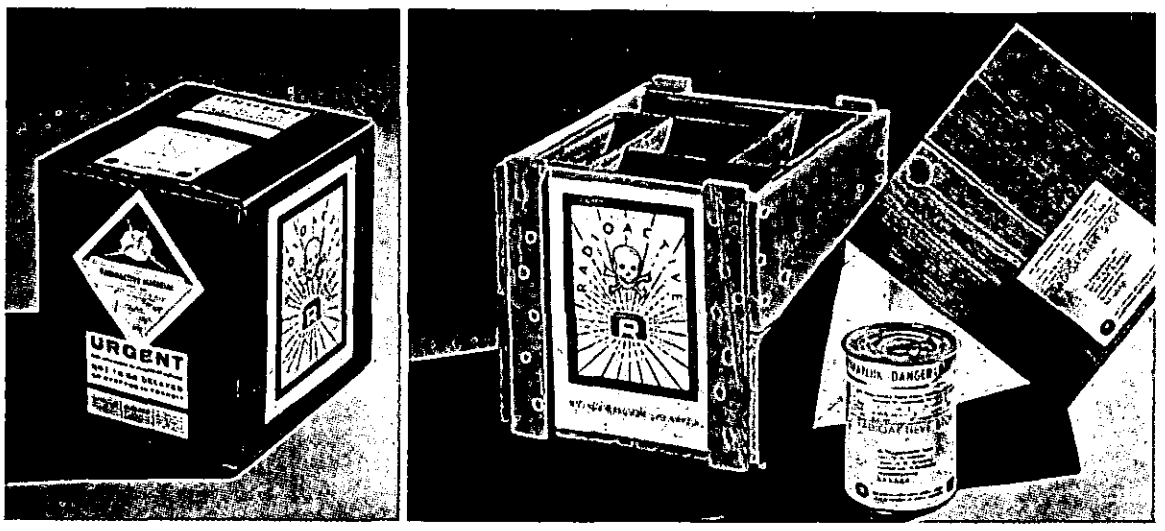


Fig. 1. Packing for radioactive isotopes.

Holding the tin with one hand and opening it with the other hand by means of a tin-opener will require between 0·5 minute and 1 minute. Here the dose received by the hands will vary between 25 and 110 mr., that received by the body lying between 2 and 5 mr. The mean distance between the centre of the tin and the body is assumed to be 20 cm. The top of the lead screening is now quickly removed from the open tin by means of tweezers of 30 cm. length or long tongs, and then the bottle of radioactive contents is placed in the safe, or in the container intended for further transport, within 10 seconds with the same tweezers or a special bottle tong. During this manipulation the dose received by the hands will amount to some 2–4 mr. and on the body to 0·5–2 mr. if the bottle contains, for example, 200 mC. of ^{131}I. The maximum dose received by the hands varies during the above process between 30 and 120 mr., that received by the body between 3 and 8 mr. It appears that the dose on the hands must be reduced, for which several possibilities are available:

1. To manipulate the tin not with the hands but with tongs.

2. To limit the period required for the opening of the tin. This period can be shortened if the supplier of radio-isotopes supplies these in a tin provided with a top that can be torn away.

3. To place the tin in a vice mounted on a rotating table and to use a tin-opener or a key with a long handle. The hands are now exposed to a dose rate reduced by a greater distance.

4. To facilitate the opening of a tin at a distance and behind lead screening by further mechanisation.

By a favourable combination of the above possibilities it is possible to achieve a reduction of the dose received by the hands and by the body by a factor of 5 to 10 with simple means. The hospital physicist can be relied upon to do this without seeking a solution in expensive installations.

Because of the exposure of the hands it is recommended to let the staff carry film badges on the wrist or to fix the badge on the lower edge of the sleeve of the white jacket, so that the position of the badge coincides approximately with the point at which the doctor feels the pulse of a patient. From the dose at the wrist the dose at the fingers can be estimated by multiplying with a factor of about 10.

When evaluating the results of the film badge it should be remembered that the toleration dose for an exclusive radiation of the hands has been fixed at 1,500 mr. per week. This does not, of course, release the staff or the head of the laboratory from taking measures to reduce the above-mentioned exposure, but it does mean on the other hand that there is no reason for panic with an exceptional dose, e.g. 600 mr. in a week, received exclusively by the hands.

Preparing the consignment for use

In a large number of cases the quantity of radioactive material just arrived is not intended for 1 patient or 1 test but for several. This means that the consignment must be split into certain portions. This distribution should always take place in the hospital laboratory inside a fume-cupboard or in a ventilated cupboard under reduced pressure, and rubber gloves or tongs should be provided for the manipulations.

It is here assumed that the consignment consists of 1 bottle whose dose rate at a distance of 1 m. without any screening amounts to about 50 mr. per hour (about 200 mC. of ^{131}I or ^{198}Au).

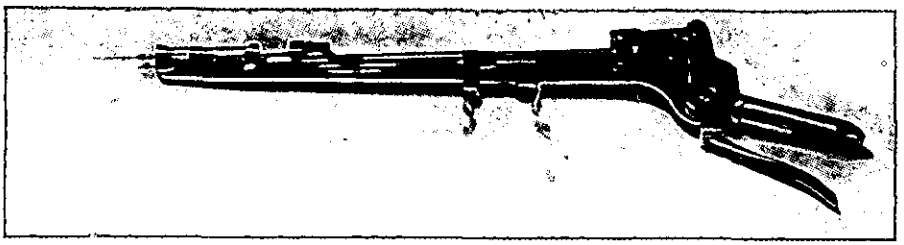


Fig. 2.
" Injection gun."

It is therefore first necessary to take the consignment from the safe to the laboratory. For this the consignment is placed, by means of long tongs, in a transport container (1·5–2 cm. lead screening).

This is preferentially wheeled by means of an isotope carrier to the laboratory fume-cupboard and then, again with tongs, the bottle is removed from the transport container and placed in a vice which may or may not be self-centring and which has 2·5 cm. lead screening at the bottom, the sides and the top. The vice is mounted in the fume-cupboard. The laboratory assistant in regulation dress (consisting of a white jacket, rubber gloves, plastic spectacles and film badges) opens the bottle at the tear-flange of the seal of the injection bottle protruding with its neck above the screening, by rolling up the cover with long tweezers and thus tearing it off, after which the rubber stopper of the bottle can be snapped off. For opening the injection bottle there are special tongs to enable this work to be done at a safe distance. The dose received during this manipulation will vary between 6 and 13 mr. for the hands and between 1·5 and 5 mr. for the body. Next the pipetting is carried out, and this can be done by means of a remote-controlled pipette. If pipetting is carried out during two minutes and the consignment is divided into 3 portions, then without any further special screening no greater dose than 6 mr. will be received by the hands and the body. By pipetting by remote control behind 5 cm. of lead screening, this dose can be reduced by a factor of more than 100.

If no remote-control pipette is available and pipetting is carried out in the same way as with substances which are not radioactive, not at a distance but with the normal routine speed, higher doses occur, namely 10–20 mr. for the body and some 50–100 mr. for the hands. Under no circumstances may radioactive materials be sucked into the pipette by mouth. Such sucking is carried out by means of a rubber balloon.

The dose also depends on the amount and the number of the portions into which the supply must be divided. If the work is performed without any screening, first the larger and then the smaller portions must be pipetted and taken away or administered. Let the ratio of the portions to be measured be 6 : 1 : 1. The radiation dose with unscreened pipetting in the sequence of these amounts will be equal to 8, 2 and 1, the total therefore being 11. If pipetting in the reverse sequence, the radiation dose will then be equal to 8, 7 and 6, the total being 21, so that the dose received is almost twice as great.

Even when making use of screening for the bottle it is still better to pipette first the large portions on account of the dose received by the hands and the head. A further improvement can be obtained by screening not only the supply bottle but also the pipette.

This can be done by means of a sheet of lead glass, 20 to 40 mm. thick, with a lead equivalent of at least 25 per cent. This reduces the dose for the body, due to the liquid ^{131}I or ^{198}Au in the pipette, by a factor of between 4 and 16.

In case that a bottle of 200 mC. ^{131}I or ^{198}Au is pipetted in one portion, then depending on the method used and the kind of pipetting installation the dose received by the hands will amount to between 0·03 and 100 mr. and that received by the body between 0·03 and 20 mr.

If the radioactive liquid is to be sucked into a syringe, there are two methods of screening. In the first, use is made of a screened syringe. A disadvantage with a syringe screened against gamma radiation is its weight. Particularly in the case of isotopes emitting hard gamma rays this weight becomes an insuperable obstacle. In the case of the very much softer radiation emitted by ^{131}I and ^{198}Au, the screened syringe can only just be handled. As the hand is so close to the radioactive liquid to be injected, a screening with about 2 cm. of lead is required, so that a screened 5 ml. syringe would weigh about 1·5–2 kg., a weight which in practice will probably give rise to difficulties.

The dose then received by the hands will amount to about 6 mr., and that received by the body about 0·1 mr., if 2 minutes in all are required for filling the syringe and injecting some 200 mC. of ^{131}I or ^{198}Au.

In the second method, working at a distance is achieved with the help of an " injection gun." A normal syringe can be placed in this injection gun (Fig. 2). Both the filling of the syringe and the injection can thus be performed at a distance. Even when injecting 200 mC. of ^{131}I in one portion, which would hardly ever be the case in practice, the dose

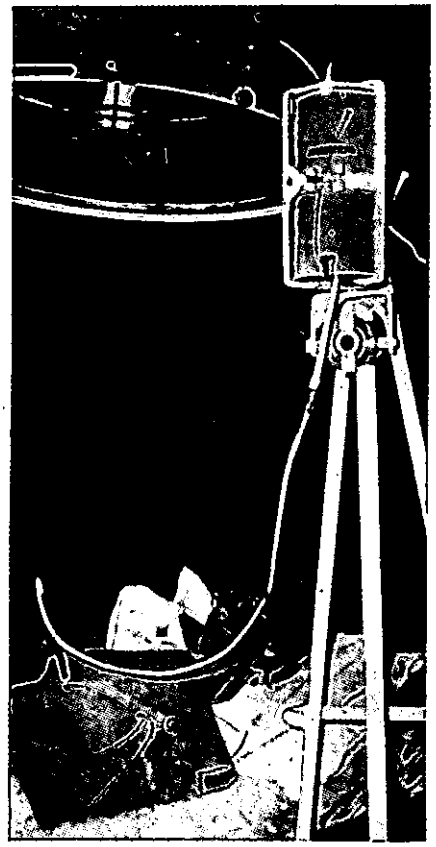


Fig. 3. Screened infusion apparatus.

received by the body in this method would not exceed some 5 mr. The method of injecting with the help of an injection gun is the only one indicated for emitters of hard gamma rays such as ^{21}Na or ^{206}Bi.

The administering of an oral therapeutic or diagnostic dose can be effected particularly well by offering the drinking glass in a vessel with a long handle, so that the distance affords protection to the person giving the dose to the patient. Furthermore the vessel gives a considerable reduction in the risk of spilling or contamination.

The dividing of a consignment into 3 approximately equal portions and the administering of injections result, when working without any screening except for that of the supply bottle itself, in a dose on the hands of about 410 mr. and on the body of about 30 mr. When using a remotely controlled pipette and a screened syringe, these doses are reduced to about 12 mr. for the hands and about 6 mr. for the body.

When instead of a screened syringe an injection gun is used, the approximate doses received by the hands and the body are 25 mr. and 10 mr. respectively.

Table of the maximum radiation doses for a consignment of 10 units and the manipulation of 200 mC. of ^{131}I or ^{198}Au.

Description	*Dose on the hands in mr.*	*Dose on the body in mr.*
1. Collection of the consignment from the airport or railway station	3–6	3–6
2. Transport to the hospital ...	2–7	2–7
3. Taking the consignment into the hospital	3–6	3–6
4. Total of 1, 2 and 3	8–19	8–19
5. Opening of the outer wrapping	1·5–3·5	0·4–0·9
6. Opening of the inner wrapping with kitchen utensils	25–110	2–5
7. Opening of the inner packing with special tools	5–15	1–3
8. Putting away of the bottle containing the radioactive material in the safe	2–4	0·5–2
9. Total of 5, 6 and 8	28·5–117·5	2·9–7·9
10. Total of 5, 7 and 8	8·5–22·5	1·9–5·9
11. Placing of the bottle with active material from the safe into the portable container	2–4	0·5–2
12. Transport within the hospital inside the portable container...	0·3–0·6	0·3–0·6
13. Taking the bottle with active materials from the portable container and placing it into the pipetting installation ...	2–4	0·5–2
14. Opening the bottle	2–4	0·3–0·6
15. Total of 11, 12, 13 and 14 ...	6·3–12·6	1·6–5·2
16. Operating the remote-controlled pipette, bottle not screened ...	3–9	3–9
17. Operating the remote-controlled pipette provided with 5 cm. lead screening	0·03–0·09	0·03–0·09
18. Pipetting without remote-controlled pipette, only the supply bottle being screened	50–100	10–20
19. Pipetting without remote-controlled pipette, bottle screened, pipette screened with lead glass having a lead equivalent of 5–8 mm.	50–100	0·5–5
20. Pipetting without remote-controlled pipette, bottle screened, pipette screened with lead glass, pipette handled with a 30 cm. long pipette holder	8–16	0·5–5
21. Injecting 200 mC. ^{131}I or ^{198}Au without screening	200–500	10–20
22. Injecting 200 mC. ^{131}I or ^{198}Au by means of a screened syringe	3–9	0·05–0·2
23. Injecting 200 mC. ^{131}I or ^{198}Au by means of an injection gun...	10–30	2·5–7·5

For the administering of radioactive gold, use is made of a screened infusion apparatus (Fig. 3). In this apparatus the radioactive gold is contained in a holder screened by at least 1·5 cm. of lead. The distance between the personnel and the radioactive

preparation during the infusion amounts to about 1·5 m.

By means of this combination of screening and distance the dose rate at the place occupied by the personnel should not amount to more than 2 mr. per hour.

The nursing of the patient

A patient to whom a therapeutic dose has been administered such that at a distance of 100 cm. from him the dose rate exceeds 10 mr./h. should, as far as possible, be isolated from other non-radioactive patients and staff.

If several such patients are lying in one room, care should be taken that the distance between the centres of their beds should amount to about 2 m.

The nursing staff must work quickly and maintain as big a distance between themselves and the patients as possible. The aim should be to reduce the total effective nursing period per patient and per day to 1 hour or less. Young nursing staff should preferentially not be employed for nursing in the radioactive department. The visit of children and young persons should be reduced to a minimum.

Furthermore one should usher the visitors as inconspicuously as possible to the foot of the patient's bed, except for a short moment for greetings and saying good-bye.

A daily control of the level of radiation in corridors and rooms is desirable. In neighbouring rooms where there are no patients who have been treated with radioactive materials, the radiation level as measured at the walls should not exceed 2 mr./h.

The excreta can be collected quite normally. The disposal of ^{131}I and ^{32}P can be performed as follows: The urine of patients who have been given ^{131}I is treated with NaI or KI in the same quantities, expressed in grammes, as mCs. have been administered. During the first three days, 30 per cent of this total quantity is added daily, and for the following 5 days a daily 2 per cent is added. The urine thus treated, when diluted up to 10 μC. per litre, can be poured into the drains of the hospital, where a further dilution up to 0·05 μC. per litre must take place before passing it to the communal drains. Excreta containing ^{32}P must be treated with sodium phosphate, using 10 g. of phosphate to 1 mC. When diluted to 0·1 μC. per litre this solution can be poured into the drains of the hospital, where further dilution up to 0·05 μC. per litre must take place before passing it into the communal drain.

In the Netherlands, before disposing of radioactive materials, the head of the district and the competent inspector of the Public Health Inspectorate must be consulted.

In view of the fact that most radio-isotopes used in medicine have a comparatively short half-life, such waste should, if possible, be first stored for some time in one or more tanks.

Even when the drains, perhaps because of seasonal circumstances, contain only a little water and have a low speed of flow, it is still possible to pass the contents of such a tank into the communal drains after the radioactivity has decreased, and the concentrations, given above, can then be used as a guide. Such tanks are particularly suited for the disposal of ^{198}Au. Apart from ^{131}I, ^{32}P and ^{198}Au, ^{90}Sr and ^{60}Co also find application, the last-mentioned isotopes being used only in closed applicators such as needles, tubes, etc.

With these isotopes the question of such waste disposal does not arise. Admittedly in the course of time the activity of ^{60}Co falls to such an extent that a new consignment becomes necessary. If the old applicators are to be neither used nor stored any longer it is, however, best to apply to the supplier for disposal instructions.

Summary

An estimation is made of the radiation dose received by all persons concerned with the handling and the transportation of radio-isotopes, from the arrival at the airport or station to the disposal of radioactive waste, and the precautionary measures to be adopted are considered.

N.I.F.E.S. OIL-FIRING COURSES

Three-day courses on oil firing are arranged at frequent intervals by the National Industrial Fuel Efficiency Service. To date 42 courses have been held and 899 engineers have taken the course.

The next one will be held from 3rd to 5th May, 1960, at Ailsa House, Kings Road, Reading.

The course has been designed to meet the needs of industrial plant engineers, heating engineers and supervisory staff responsible for oil-fired boiler plants.

The fee for the course, exclusive of hotel accommodation, will be six guineas. Application forms, and a course syllabus may be obtained from the National Industrial Fuel Efficiency Service, 71, Grosvenor Street, W.1 (Tel.: Hyde Park 9706).

NEGRETTI HUMIDITY CONTROLLERS

A brochure, No. R.30/IH/1959, deals with air operated and electric contact Humidity Controllers and is sent to us by Negretti & Zambra Ltd., 122, Regent Street, London, W.1.

The Company point out that often the problems of a control scheme are complicated and their technical staff are available at any time to advise on the most suitable methods applicable to any particular case.

KODAK PUBLICATIONS

The latest Kodak brochure received covers the Company's Papers for every photographic purpose. The various particular qualities of many of these are illustrated.

Correspondence

11th April, 1960

The Editor.

Technical Qualifications

DEAR SIR,

Whatever the actual proposal of the Association of Hospital Management Committees may mean, I agree with Mr. W. A. Galt, and I think that any lowering of qualifications for the purpose of making it easier to fill vacancies should be actively opposed by every Hospital Engineer, whether he himself is technically qualified or not.

There is, I am afraid, a tendency to think that undue emphasis is placed upon " paper qualifications " in selection for a post, and this feeling, if not checked, can strike at the very mainstay of our claim for appropriate salaries. There can be no question that any hospital engineer who has been competent and ambitious enough to get to the top and successfully run his job has definitely proved his value, whether he has technical qualifications or not. Indeed, this fact is recognised by the Minister through the " safeguard " clause, where a man without the qualifications mentioned, but in post at a certain time, of a certain age, and with sufficiently long service, can qualify for further promotion and higher salary.

The trouble is that these men, although difficult to replace, rarely realise their own value. The gradual process which in the past has enabled them to acquire the varied experience, resource, and personality necessary for the proper running of the job, all over a period of many years, simply does not apply under present day conditions. The only possible substitute for selection is a person with much shorter hospital experience, but suitable background and technical qualifications to compensate. There can be no escaping the fact that the qualifications asked for by the Minister for new entries are right for the job, and the only thing wrong is the salary offered. May I take two instances, at each end of the scale, having regard to the Minister's Circular.

Assistant Engineer. It is obvious to anyone reading the Circular that the applicant for this post was intended to be young, ambitious, of officer type, well trained, and with good experience outside the Service. His O.N.C. of the kind asked for would show that this first job was just a stepping stone to the top job, studying for further qualification on his way, and giving his superiors unlimited help because of his enthusiasm, technical knowledge, and ability to control staff.

Superintendent Engineer. It is plain that the Minister intended the person filling this post to have such training and personality as to be able to consult on equal terms with Group Secretary, Regional Engineer, Consulting Engineers and others in similar positions, without feeling inferior, and be able to advise Committees with confidence because of his basic training and technical knowledge and not because it was " what the book says " without fully understanding the principles involved. The qualifications asked for would ensure this if backed with sufficient practical experience of the right kind in hospitals.

In conclusion, getting back to my statement that the " old hands " do not always realise their value because of the long, gradual process involved, it is because of this that I have long thought that all Whitley Council representatives should be technically qualified. Only these people can properly assess the cost of their training, the countless hours spent in study undertaken for the one purpose of fitting them for a better job, and thus be less disposed to place too low a value on their worth to the Health Service. That is, of course, providing that they are also suitable negotiators, and I am afraid that hospital engineers, in keeping with members of other professions, are not the best ones to negotiate for improvement of their own personal conditions.

Yours faithfully,

S. G. GILMORE,
Superintendent Engineer.

Mapperley Hospital,
Nottingham.

METALOCK DEVELOPMENTS

Metalock Ltd., of Grand Buildings, Trafalgar Square, W.C.2, the well-known " cold repair " people, will be pleased to send readers a copy of *International Metalock News* and other literature illustrating the Company's system and developments for the cold *in situ* repair of fractured castings which has saved so much time and money in recent years.

Branch offices now give complete coverage of the U.K. and instant attention will be given to all enquiries.

Hon. Secretaries of Branches may be interested to know that the Company will gladly lend free of charge its film " Cold Repairs by Metalock " for showing at Branch meetings, and an experienced Metalock engineer can also be available, if required, to explain any points and answer questions. We think this offer well worth considering.

ASBESTOS MILLBOARD

Applications of asbestos millboard are too numerous to mention in any one publication, but Turner Brothers Asbestos of Rochdale will be pleased to send to any reader a copy of a leaflet that they have produced in which they have tried to suggest some of the many diverse uses of this product.

COLOURED BITUMINOUS PAINTS

Premier Bitumen & Asphalte of Bracknell, Berkshire, have sent us details of their green, grey and red bituminous paints for outside use. These are in addition to the Company's standard black and bitumen based aluminium paints, and are all normally one coat paints especially suitable for metal and asbestos, giving a coverage of some 40 yards per gallon.

Northampton General Hospital Major Extension

The first major comprehensive Casualty and Out-Patients Block to be completed under the National Health Service

THE new £400,000 Casualty and Out-Patients Department of the Northampton General Hospital, recently completed, is a particularly significant project in that it is of itself virtually a complete new hospital.

Being the first major comprehensive hospital block of its type to be completed under the National Health Service, it comprises 30-bed accident wards, two operating theatre suites, X-ray rooms, a pharmacy, pathological laboratory facilities, isotopes room, a dental department, hearing aid and audiometry rooms, etc.

The initial outline scheme was drawn up by W. F. Howard, F.R.I.B.A., and the detailed planning and execution of the contract was under the control of Sir John Brown, A. E. Henson and Partners, of Northampton.

The Consultants appointed for the building were Messrs. Walter C. Andrews and Partners, 167, Victoria Street, London, S.W.1, for the structural framework and Messrs. Phillips Son and Norfolk, Arskus House, Annesley Grove, Nottingham, for the engineering and electrical services.

A specialist job

It is also interesting in view of the specialist nature of the job, for the requirements of each of a large number of medical specialists was considered, and allowance made for the continuous development of medical science. In this connection Mr. C. Featherstone of Messrs. Sir John Brown, A. E. Henson & Partners, says:

"This had its repercussions on the finalisation of detail for the builders and wide range of specialist sub-contractors. It also presented a substantial problem for the General Contractors in co-ordinating work on the site. In view of these points the practical completion period was most satisfactory."

A War Memorial

Originally, in 1945—in the voluntary hospital days—the building was conceived by the hospital's board of management as a war memorial to the people of the Town of Northampton and surrounding country who fell during the last war. Thus towns and villages in the area served by the hospital raised some £180,000 which, with accrued interest, has gone towards the cost of the building.

However, it was not until October, 1956, that the foundation stone was laid by H.M. The Queen Mother.

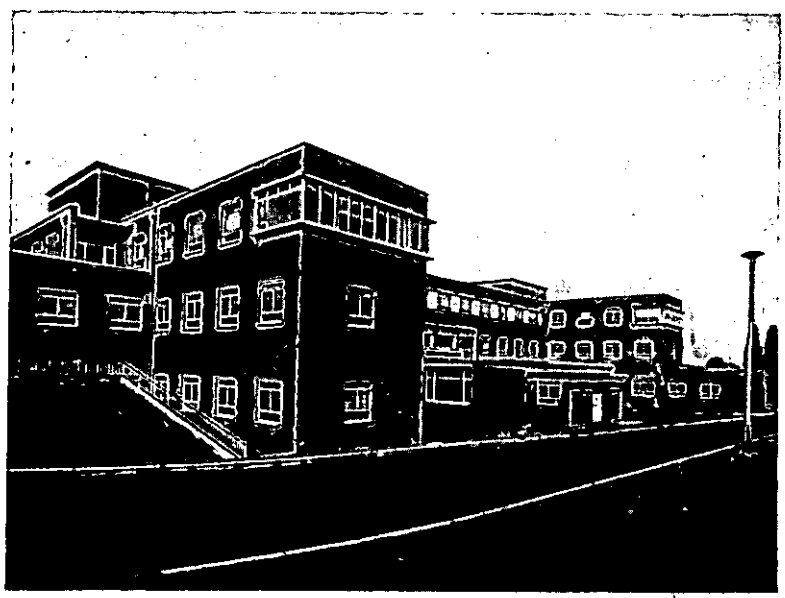


Fig. 1. A view of the back of the new £400,000 Casualty and Out-Patients Department at Northampton General Hospital which illustrates the sloping nature of the site. The twin major Operating Theatre suite forms the single storey central extension at lower ground floor level. A similar extension on the extreme right contains the twin minor Theatres.

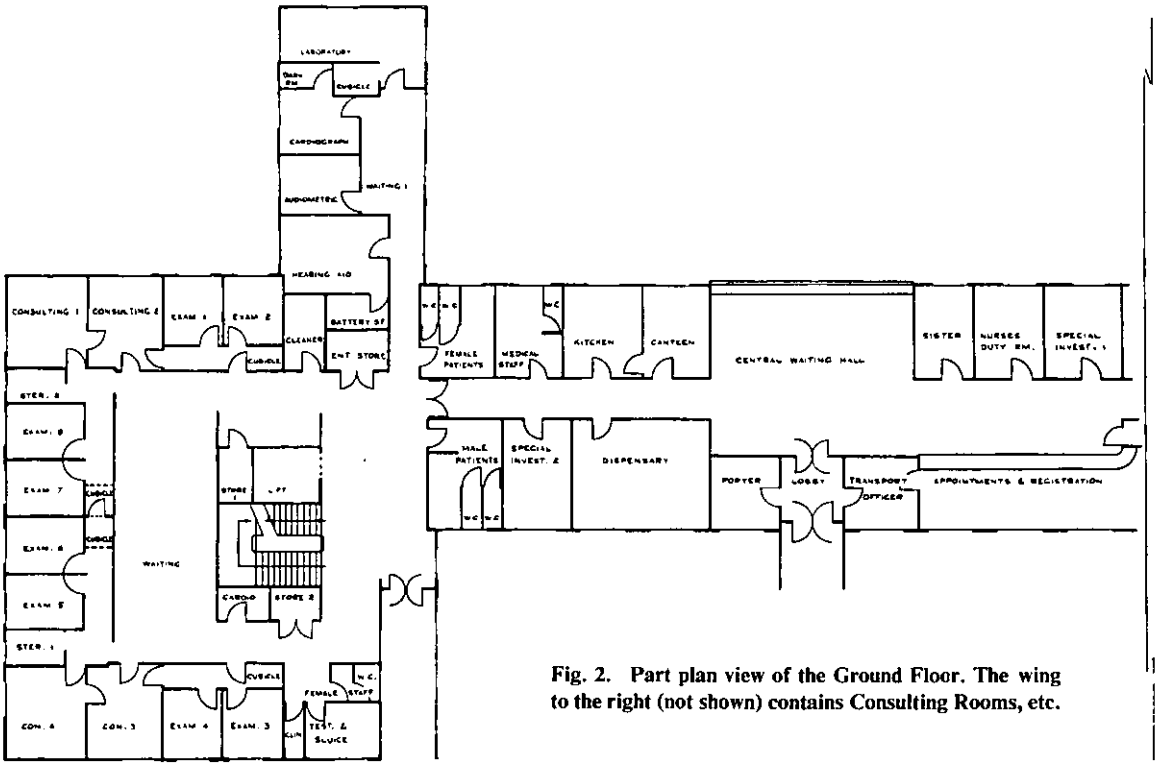


Fig. 2. Part plan view of the Ground Floor. The wing to the right (not shown) contains Consulting Rooms, etc.

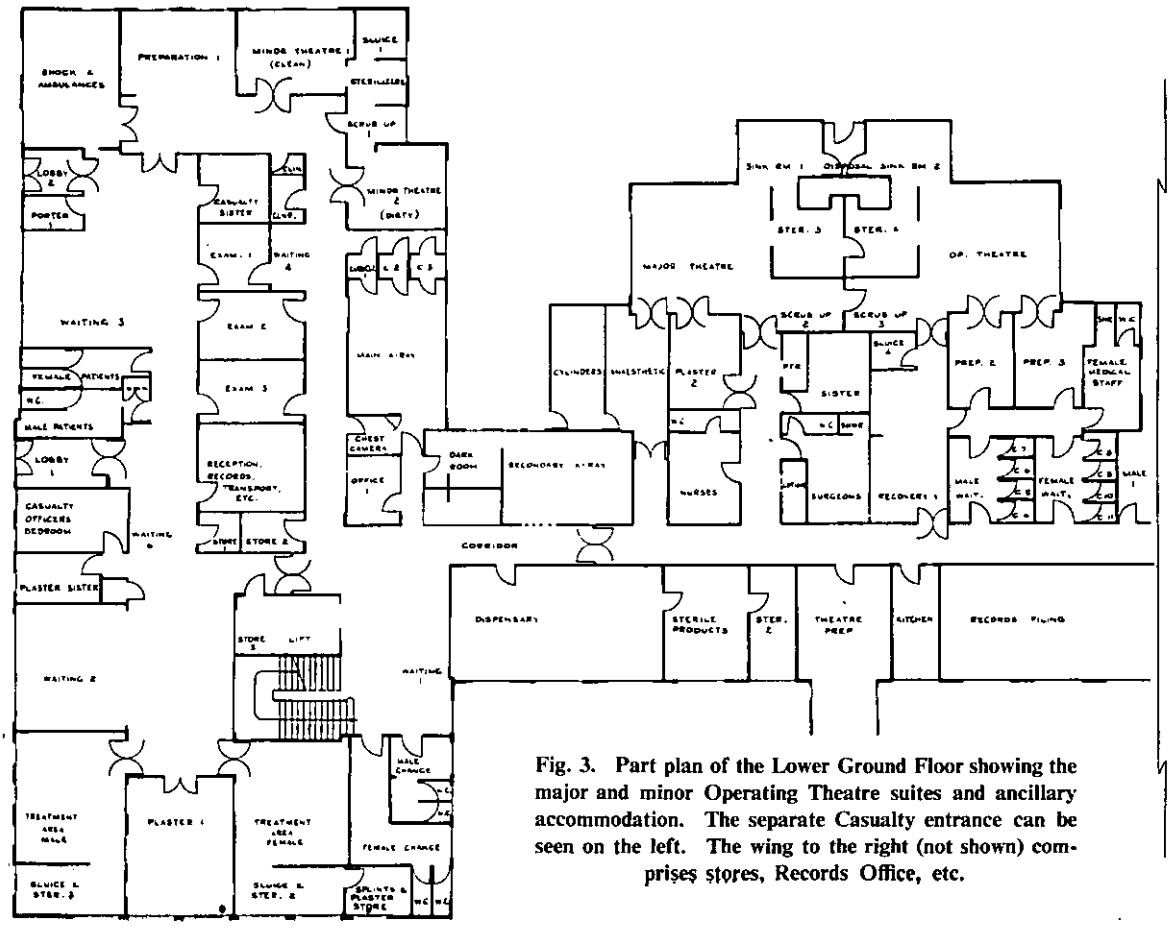


Fig. 3. Part plan of the Lower Ground Floor showing the major and minor Operating Theatre suites and ancillary accommodation. The separate Casualty entrance can be seen on the left. The wing to the right (not shown) comprises stores, Records Office, etc.

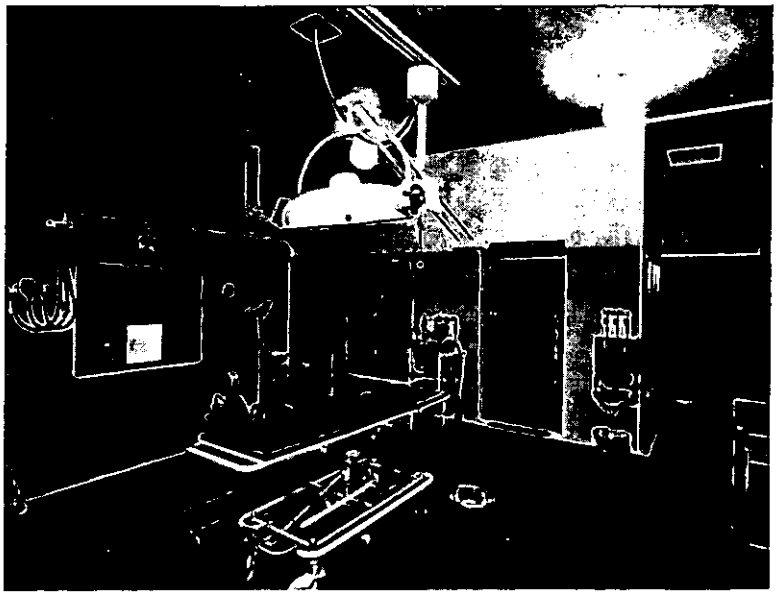


Fig. 4. One of the two major Operating Theatres. The Autoclave between the two can be seen in the middle background. Piped services for gases and sterile water supply can be clearly seen.

Three floors

The building has a reinforced concrete frame clad in buff-coloured brickwork and consists of a lower ground floor, ground and a first floor.

The main entrance is on the ground floor and leads into a foyer which forms a central assembly area for out-patients with a reception counter, snack bar, transport office and pharmacy all leading off. Also on this floor are four consulting suites, each with two consulting rooms, two dressing cubicles, four examination rooms and a sterilising bay.

The almoners' offices, patients' surgical appliances office, the hearing aid and audiometry, and other specialist departments with the relevant cubicled areas, are contained in the two ground floor wings of the building.

Thirty-bed accident ward

On the first floor there is a thirty-bed accident ward comprising two eight-bed, curtain-cubicled wards and fourteen single wards. Here, there is a trolley telephone service for outgoing calls, a nurse-

Fig. 5. One of the two minor Operating Theatres, with the joint scrub-up facilities in the middle background.

call system, two-channel radio, and television is provided in the day rooms.

In addition, the unit includes treatment rooms into which beds may be wheeled, and also two rooms for the relatives of seriously-ill patients.

Casualty department

As the site slopes, the entrances to the lower ground floor are at ground level and give immediate access to the casualty and plaster departments.

The former consists of a shock room, cubicled for three patients, examination rooms, and two minor theatres with preparation rooms. There are also duty rooms, a kitchenette, and a bedroom for the casualty officer on duty.

Nearby there is a large plaster room with adjoining examination rooms and splint room, and also an X-ray unit comprising three X-ray rooms, office, dark-room, etc.

There is also a pharmacy on the lower ground floor which is connected by an electric service hoist to the dispensary immediately above on the ground floor where medicines are dispensed to out-patients.

Operating Theatres

The centre space of the lower ground floor is occupied by two comprehensive operating theatre suites, each of which is self-contained.

The theatre unit is made up of a major orthopaedic theatre and an out-patient theatre with adjacent rooms for preparation, anaesthetics, sterilizing, scrub-ups, changing, and accommodation for theatre sister, surgeons and nurses. In this unit is also situated the central dressing sterilizing plant and the major part of the dispensary.

Then, in the west wing, there is a dental suite comprising two consulting rooms, a theatre, an office and a particularly well-fitted dental workshop. Also in this wing, and taking up a part of the centre block, is the medical records department—with an electric service hoist to the out-patients reception counter on the ground floor—record offices; and the plant room.

Structure

The three-storey main building is of reinforced concrete frame on mass concrete foundations and is clad with 11 in. cavity brickwork. All internal partitions are either of brick or of 3 in. Melcrete blocks. The structural floors are *in situ* solid concrete or hollow pot. Lintels, sills, and certain external wall panels are of reconstructed Portland stone and all windows are of steel.

Fig. 6. With the main Patients' entrance on the left, this picture is of the central reception area. The Pharmacy counter is seen on the left and, in the right background, is the snack bar.

The Site

The site is situated on the extreme southern edge of the existing General Hospital and is connected to the Hospital by an underground service duct and by a ground level covered way. The site slopes steeply from the north-west corner to the south-east which enables direct access to be made to both the ground and lower ground floors. Large car park and ambulance parking areas have been provided as well as two smaller buildings to house the electrical sub-station and an inflammable material store. The site sub-soil was of varying nature from rock to sandy gravel and contains several free running springs. The whole of this free running water was piped in

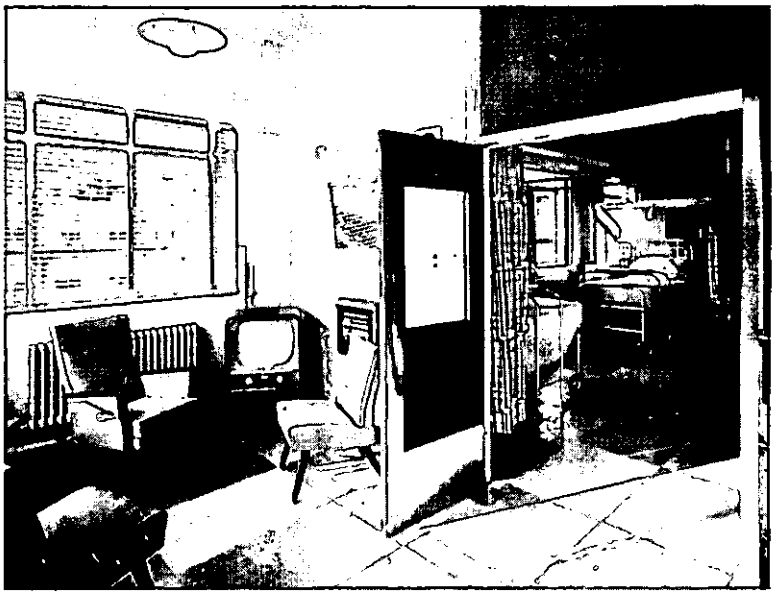


Fig. 7. In the foreground is one of the comfortable day rooms, while, through the doors, a corner of an eight-bed ward can be seen.

site drains away from the ground and the whole of the lower ground floor completely tanked and waterproofed.

Services

The building is fully equipped to provide a main supply to all departments of:—

(*a*) Steam for sterilizers.
(*b*) Hot water heating by radiators and by ceiling heating panels.
(*c*) Direct and tank supplied cold water.
(*d*) Domestic hot water.
(*e*) Gas.
(*f*) Electric lighting and power services.
(*g*) Hot and cold sterile water.
(*h*) Nitrous oxide, compressed air, oxygen and vacuum supplies.
(*i*) Internal and external telephones.
(*j*) Fully mechanical ventilation to the theatre unit and the sterile products rooms.
(*k*) Patients' call system and radio.

The supplies for all heating services are by calorifiers which are fed from the main Hospital steam supply from the central boiler house and the whole

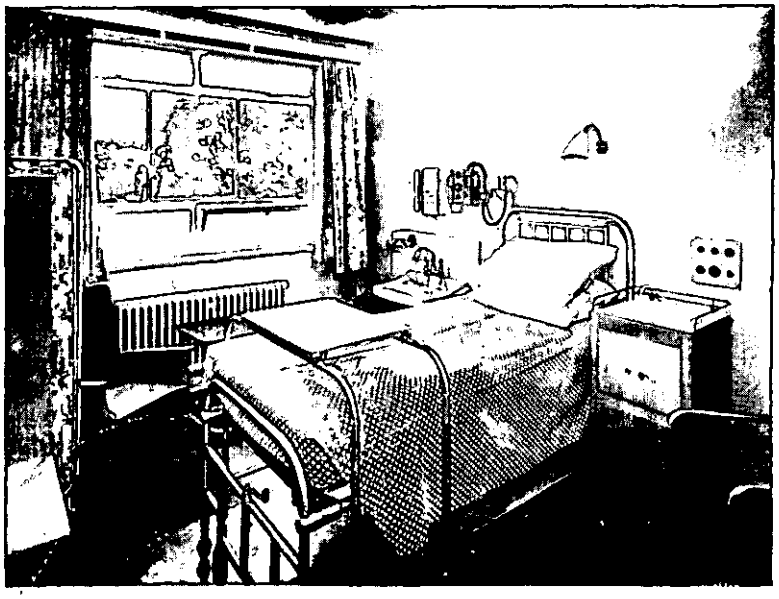


Fig. 8. One of the single bed wards. The piped oxygen supply can be seen above the lavatory basin. The pleasant outlook is noticeable.

of the plant for the Out-Patients and Casualty Departments is located on the lower ground floor of the new building.

Finishes

In every case the finishes throughout the building have been selected in close co-operation with the Hospital Management Committee and are such that they afford the minimum maintenance consistent with the Hospital's requirements of cleanliness, durability, sound reduction and good appearance.

(*a*) Floor Finishes: Terrazzo flooring to all toilets, sluice room, sterilizing rooms, theatres and preparation rooms, anti-static where necessary. P.V.C. tile flooring to all kitchens, laboratories, dispensary, cloak rooms and changing rooms. One piece welded P.V.C. flooring to radiological rooms and dental surgery. Wood block flooring to X-ray rooms, granolithic flooring to covered way and plant room. Lino tile flooring elsewhere.

(*b*) Wall Finishes: Walls to main theatres and ancillary rooms are terrazzo. Emalux glazed cement wall finish to theatre corridors, casualty theatre suite, and all toilets, changing rooms and dental surgery. Semi-gloss oil paint on plaster for all other walls.

(*c*) Ceiling Finishes: Ceilings generally are plastered and decorated with semi-gloss oil paint. Heated theatre ceilings are specially plastered on expanded metal on Raypla ceiling heating panels. Ceilings to corridors and waiting spaces contain all horizontal services above suspended ceiling of fibrous plaster tiles.

Fittings

The General Contractor's work included responsibility for the supply and fixing of all built-in joinery (i.e. cupboards, drawers, benches, special laboratory, dispensary and dental mechanics equipment) and also built-in viewing boxes, instruments cupboards, theatre lighting and controls, sterile water points, hose reels, X-ray processing equipment, automatic dry sterilizing equipment and wet sterilizing equipment, cubicle railing, Venetian blinds, kitchen equipment and any specialized storage and locker accommodation.

It is therefore evident the project required very careful co-ordination. That it was completed so successfully in the relatively short period of two years is undoubtedly a testimony both to the architects and the general contractors, Robert Marriott Ltd. of Rushden, Northamptonshire.

SUB-CONTRACTORS AND SUPPLIERS

Armour Plate Glass Doors	**Pilkington Bros., St. Helens**
Cubicle Railing	**Silent Gliss Ltd., London**
Cycle Racks	**Le Bas Tube Co. Ltd., London**
Day Room Blinds	**J. Avery & Co. Ltd., London**
Doors	**Leaderflush Doors Ltd., Nottingham**
Double Glazing	**Pyglass Ltd., Harlow**
Engineering Services	**W. Preer Ltd., London**
Fibreglass Rooflights	**Allan Blunn Ltd., London**
Gas Cookers	**East Midlands Gas Board, Northampton**
Glass and Concrete Rooflights	**J. A. King & Co., London**
Hose Reels	**Merryweather & Sons Ltd., London**
Instruments Cabinets	**Crittall Manufacturing Co.**
Internal Telephone System	**Telephone Communications**
Lifts and Hoists	**Express Lift Co., Northampton**
Lighting Fittings	**Falks, Stadelmann & Co., Leicester** **Merchant Adventurers, London** **Troughton & Young, London**
Lino and P.V.C. Flooring	**Marbolith Co. Ltd., London**
Paint	**Walpamur Co. Ltd., Darwen**
Piped Anaesthetics	**British Oxygen Gases, Birmingham**
Plastic Floor Sealing	**Floor Treatments Ltd., High Wycombe**
Signs	**Drakard & Humble, London**
Steel Shelving	**Sankey Sheldon, London**
Sterile Cabinets	**Roneo Ltd., London**
Sterile Water	**C. F. Thackray, Leeds**
Sterilizers	**Allen & Hanbury, London**
Suspended Ceilings	**Campbell Denis, London**
Terrazzo Walling and Flooring	**Jaconello Ltd., Birmingham**
Theatre Lighting	**Technical Lights & Equipment**
Windows	**Crittall Manufacturing Co., Leicester**
Window Opening Gear	**Arens Controls Ltd., East Croydon**
Venetian and Blackout Blinds	**Northampton Sunblind Co. Ltd**
X-ray Equipment	**A. E. Dean, Waddon, Surrey**
X-ray Viewing Boxes and Developing Tanks	**W. Watson & Glover, Birmingham**

REFRESHER COURSE FOR WORKS AND PLANT ENGINEERS

A residential refresher Course will be held at Prestatyn Holiday Camp from 30th May to 4th June, 1960. The aim of the course is to give a review of the heating systems available and the general methods of calculating the heat requirements of buildings. Reference will also be made to thermal insulation and The Thermal Insulation (Industrial Buildings) Act, 1957. The lectures will be suitable for industrial, hospital, and Local Authority engineers who have space heating as one of their responsibilities and not so specialised as to require heating engineers of considerable experience to appreciate them. The lectures will explain general heating principles, the advantages and disadvantages of the various heating systems and assist in assessing the problems connected with heating a new building or improving the heating of existing premises.

Brochures and application forms should be obtained from:—

The Secretary of the Course, National Industrial Fuel Efficiency Service, Baltic House, Mountstuart Square, Cardiff.

CHANGE OF TELEPHONE NUMBER

The telephone number of the Service Department of Research and Control Instruments Ltd., 49, Temperley Road, Balham, London, S.W.12, has been changed to BATTERSEA 8641 (four lines).

Abstract of Reports

ORPINGTON & SEVENOAKS H.M.C.

The ninth report of the Committee covers the period ending the 31st March, 1959. The initial results of the Day-Centre have proved most promising. This venture, aimed at the general rehabilitation and daytime care of the disabled or chronic sick patient, was inaugurated on the 15th September, 1958. It is hoped to relieve the pressure on hospital beds through this scheme by increasing the turnover of patients.

In February 1959 the Emily Jackson Wing of Sevenoaks Hospital was brought fully into use with an availability of 30 beds.

Whilst at Orpington Hospital there are no major developments to report, the policy of improving the facilities for patients continued by way of upgrading certain ward kitchens, sluice rooms and toilets.

A major extension of the X-Ray department at Sevenoaks Hospital has been completed and this has more than doubled the facilities. Other improvements at Sevenoaks Hospital include the conversion of the coke boilers to oil fuel, and the installation of an incinerator.

At Oak Lane Hospital the north block was modernised and re-equipped as a geriatric ward but was not brought into operation during the year.

A policy of progressive improvement was continued at Sundridge Hospital and this consisted mainly of plastering of brick walls but, also, with minor structural alterations, including the creation of a meeting room, three additional toilets, a visitors' waiting room and improving the approach to a section of the wards.

There were reductions in the cost of fuel and light in the year under review amounting to £3,000. Fuel and light showed the economy at Orpington Hospital resulting from the purchase of a better grade coal with a higher degree of fuel efficiency, plus the effect of improvements to steam services designed to use all the condensate return.

The mild winter was also a contributory factor. Capital expenditure on buildings and equipment during the year amounted to £24,024.

LEICESTER No. 3 H.M.C.

The report covers the period ending the 31st March, 1959. At The Towers Hospital, modernisation of Wycliffe Ward and its dormitory, together with other rooms, and corridors has been completed. Other work has proceeded and planning has also been done for the reconstruction of Woodhouse Ward, the female infirmary and Beaumanor Ward for seniles.

From earlier experience the ideal plan for ward modernisation with enlarged kitchens, adequate bathrooms and storerooms, some sitting, apart from dining, accommodation and screening within dormitories is now being conceived, though in due course some additional work may be required in those wards that were first upgraded some years ago.

In connection with the control of infection, a report to the Management Committee was submitted in March 1959 in which various general principles were established and definite recommendations were made for improvements in the foul laundry at The Towers. Already, extensive alterations are being made in the laundry together with the fitting of new machinery.

At Leicester Frith the new Recreation Hall was officially opened in July 1958 and, since then, has been constantly in use for both patients and staff. Alterations have taken place to the old laundry building which was rendered redundant by the establishment of a central group laundry at the Towers Hospital. It is hoped that the old building, when finally adapted, will be available as a training department for patients of both sexes.

Some difficulty is still being experienced at Streatham Hall because of the inadequate heating of the remodelled nursery, and despite further adaptations during the year, it is still not considered satisfactory.

Kibworth Hall has just completed its first year as a unit providing accommodation for 32 little boys and there has been, of course, no need for major structural alterations. There is a serious need, however, for the adaptation of the heating services to a more economical form and arrangements for the conversion from solid fuel to oil firing are under way at the present time.

For some years there had been a progressive worsening of the condition of the entrance and forecourt of the male hostel at Bilston. This has been vastly improved by work carried out during the year. The most extensive upgrading in the Group has been in the Tower House section of the female accommodation. The work which extended to three floors had necessitated the complete evacuation of the premises and would cost in the region of £12,000. However, when completed, it would provide a unit of very considerable value to the hospital.

The report states that the programme of upgrading and modernisation has been particularly heavy during the year under review. The change in the aspect of the older buildings in the Group was now becoming apparent and the picture envisaged by the Committee in the early days of planning was now definitely taking shape. The burden of detail and follow-up had fallen mainly on the shoulders of the Superintendent Engineer and the Building Supervisor.

PORTSMOUTH GROUP H.M.C.

At the end of 1959 the Portsmouth Group Hospita Management Committee issued a comprehensive report covering the period July 1948 to December 1958. It shows that changes in disease patterns, and the movement and increase in population had a considerable impact upon the activities of the Group. There has, for instance, been an increase of 30,000 in the persons served by the Group hospitals and a gradual move of considerable numbers from more densely populated areas has combined to make the most effective use of beds a matter for constant review. There has been an increase of 44% in the number of discharges during the period.

The report stresses that the Portsmouth Group was engaging in organisation and method investigation for some years before the practice became officially recognised by the Ministry. The general Group administration

had been under constant review and this had resulted in a number of changes. It was important to say that, where the application of these studies had meant staff redundancy, it had been the policy of the Committee not to deprive loyal servants of their livelihood but to overcome the difficulties by not making up staff wastage as a result of retirements and resignations. Considerable improvements had been made in regard to internal communication by the installation of automatic internal telephone systems, thus considerably relieving the Post Office switchboard. Multitone call systems had been installed at St. Mary's and Queen Alexandra Hospitals.

In reviewing finance over the ten year period, the report shows the considerable increase in the cost of running the Group due to the increases in salaries. There were, of course, increases in the cost of almost every commodity used within the Group. Figures show that a substantial part of the Group's increased expenditure had been absorbed by unavoidable increases under the heading of power, light, heating, water, laundry and cleaning. Taking 1951–52 as a basic year, gross expenditure had increased by about 50%, caused almost entirely by the constantly increasing fuel costs. For instance, the cost of solid fuel, gas and electricity had increased from £31¼ thousand in the year 1948–49 to £107¾ thousand in the year 1957–58. By comparison over the same period laundry costs had gone up from £13½ thousand to £42¼ thousand. The major causes of the increase in expenditure of the Group since the appointed day had been due to increases in rates of remuneration, the development of new services and price increases.

The number of capital projects undertaken during the ten years is impressive, though, with the general shortage of money, it has only been possible to undertake those items regarded as immediate needs. The largest capital project undertaken in the Group is now in progress and comprises a scheme at Queen Alexandra Hospital to eliminate the present numerous and uneconomic series of boiler houses and to replace these with one oil fired central installation. At the same time the opportunity has been taken to provide badly needed workshops. The whole scheme, which will be completed by 1961, has been undertaken in three stages at an estimated cost of £121,000, though this figure is likely to be exceeded considerably. It is noteworthy that a number of capital projects have been financed by non-Exchequer monies, the largest of these being the erection of a new kitchen and dining-rooms at the Eye and Ear Hospital. Other capital schemes planned but not yet started include the renewal of boilers at St. Mary's House, a new out-patients department at Queen Alexandra Hospital together with additional operating theatre accommodation.

The major problem in regard to general maintenance had been to know how to cope with all the necessary work. Whilst it was true that the arrears of maintenance experienced in the early days had been largely overcome, nevertheless the routine day-to-day work was a considerable task. In order to assist in this matter a building supervisor had been appointed in 1957.

Further vehicles had been added to the transport fleet from time to time and, until 1956, the mechanical efficiency of the transport fleet was the responsibility of the Superintendent Engineer through the Engineer-in-Charge at Queen Alexandra Hospital. The day-to-day operation of the fleet was the responsibility of the hospital secretary in his capacity as Transport Officer. Such a divided responsibility was, however, regarded as inefficient and in 1956 the entire control of transport and the maintenance workshop was placed under the control of the hospital secretary of Queen Alexandra Hospital, with the advice of the Hospital Engineer on technical matters as necessary. A fully equipped workshop now exists at Queen Alexandra Hospital and is adequate to deal with all minor and semi-major repairs.

Reference is made in the report to the successful appeal launched by the Lord Mayor of Portsmouth for the purchase of an orbitron Cobalt 60 unit. The appeal achieved such early success that it had been decided to purchase a second machine, the Eldorado A, which would deal with a different range of cases. Though the target was £28,000 a magnificent sum of £33,500 had been achieved, and the Regional Hospital Board had provided a further £35,000 for the necessary structural work and equipment.

The Report contains a reference in considerable detail to the Portsmouth and Isle of Wight Pathological Service, the new Central Laboratory for which was opened in November 1950 by Countess Mountbatten of Burma. A detailed reference is also made to the central syringe service which was initiated at a time when no similar hospital syringe service had been provided in this country and it was therefore impossible to obtain practical advice.

This report is perhaps the most comprehensive which we have received and, in addition to being of very considerable credit to those responsible for its production, it must be most valuable to all those interested in the hospital service, providing as it does a comprehensive and critical survey of the problems encountered and the successes achieved during the first ten years of the service.

MR. J. C. KENYON HONOURED

Mr. James Christopher Kenyon, Vice-Chairman of the well known firm of James Kenyon & Son, Ltd., has been chosen as the Mayor of Bury for 1960/61. Elected to the Council in November, 1946, Mr. Kenyon has been Chairman of the Art Gallery and Library Committee since May, 1951. He also serves on a number of Corporation Committees and Sub-Committees.

Son of Mr. Myles Kenyon, Freeman of Bury, former High Sheriff of Lancashire and Deputy Lieutenant of the County, and grandson of Mr. James Kenyon, Freeman of Bury and M.P. for Bury from 1895–1902, Mr. J. C. Kenyon follows a long tradition of public service. Mr. Kenyon was educated at Eton and Trinity College, Cambridge, and he served as Captain in the Lancashire Fusiliers during the second World War, and was mentioned in dispatches prior to Dunkirk.

His wife, Mrs. Nancy Uttley Kenyon, will act as Mayoress.

A.E.I. FLUORESCENT LIGHTING

We have received a very comprehensive and fully illustrated catalogue from the A.E.I. Lamp and Lighting Co. This covers the Series 2 family of fittings, trunking and other commercial and industrial fittings. With the increasing use of suspended ceilings, the section on module fittings is of more than passing interest.

The new bi-pin types are covered and useful circuit diagrams for compounded systems are included. A price list is included as a loose appendix.

Cross-Infection — some further Notes

Combined antibiotics and hygiene measures reverse antibiotic-resistance in famous London Hospital

ONE of the most significant medical papers published in this country for years is, to judge by the interest it has aroused, that by Dr. Mary Barber, Reader in Clinical Bacteriology, and a group of co-workers at the Hammersmith Postgraduate Medical School.

The immediate significance of their work is, in the authors' own words: " It is clear from this investigation that the ever-increasing incidence of drug-resistant staphylococcal infections *can be checked.*" (Our italics.)

The means adopted in the investigation were partly hygienic control, and partly drug combination (two antibiotics instead of one). The investigators heavily emphasise the major potential role of hygienic techniques, saying: " It is possible that pathogenic staphylococci could be kept at bay if we had sufficient isolation facilities, but at present this is not the case in most hospitals in Britain."

From this remark it would appear that Dr. Barber and associates are thinking, when referring to " isolation," particularly of individual rooms for patients rather than general wards. However, as effective isolation was rarely practicable, close attention was given to measures of institutional hygiene, which were started six months before the antibiotic-combination programme, and these anti-cross-infection measures " undoubtedly played a part, and were probably responsible for a fall in the total incidence of staphylococcal infection per patient from 10 per cent to 7 per cent between January and July 1958."

Apart from isolation, whenever practicable, the institutional measures adopted were: Abandonment of linen sorting in wards; laundering and disinfecting of blankets between patients; frequent laundering and treatment of curtains surrounding the beds.

Autoclaves were checked and, wherever necessary, improved. Propaganda among the hospital staff to maintain high standards. (On two occasions a ward had to be closed because of staphylococcal infections.)

Despite the important achievement of the Hammersmith group with the reversal of antibiotic resistance in hospital staphylococcal infections—" Clearly," the authors state, " a controlled antibiotics policy gives us no respite from fighting cross-infection."

Once again it is pointed out that—" Some at any rate of the multiple-resistant strains of *Staph. pyogenes* so prevalent in our hospitals today are of enhanced virulence, both in their capacity to initiate infection and in the severity of the infection produced."

Of 452 patients with staphylococcal infections (about 8 per cent of the total examined), 49 developed generalised infection and 24 of these died. 44 out of the 49 cases (22 out of 23 deaths!) were due to strains resistant against the antibiotics customarily available.

A particularly interesting point which emerges from the investigation was that—". . . Throughout the investigation it was apparent that the strains of staphylococcus pyogenes carried by the nurses " (in their noses) " were not the ones responsible for the infections in patients."

(*Comment:* Readers are reminded of important similar findings reported by Gillespie and associates of Bristol Royal Infirmary in *The Lancet*, issue of 7th November, 1959, page 781, who said *inter alia:* " Staphylococci were probably often transferred *from patient to patient by contact with the nurses' hands and uniforms. Prevalent ward strains were often isolated from nurses' hands. But nasal carriage by nurses was rarely responsible for the spread of staphylococci amongst patients in the ward.*"

Isolation, to be effective, must be complete. Isolation, moreover, connotes the *rupture* of contact between pathogen and potential " infectee," abolition or reduction of aerial contamination by " rooming-in," and by more care with blankets, curtains, etc. Such measures cannot, however, be fully effective unless there is also as complete as possible a rupture in the chain of hand-towel-hand infections. In such circumstances the paper towel would appear to have a definite role in anti-cross-infection campaigns.

In view of the growing concern about drug-resistant " hospital " infections, many may incline to the view that it is now time for a strict investigation into the actual or potential contribution of each separate preventive component in anti-cross-infection programmes.

CLEAN HANDS BEFORE CLEAN WALLS?

While on this subject it is interesting to note that in recent British and American studies on measures to check the spread of infections in hospitals, there has been growing awareness of the major role of the hands as spreaders of infection. Airborne dust appears to be a minor source of contamination in comparison with the hands.

Dr. J. D. Allan Gray, bacteriologist in charge of anti-cross-infection measures at the Central Middlesex Hospital, London, in a letter to *The Lancet* makes the interesting point that, while dust and dirt should be eliminated from hospital walls as an obvious measure of institutional hygiene, " bacteriological culture of the dirt seldom yields staphylococci."

THE EXPANDITE GROUP OF COMPANIES

New Subsidiary Company

Expandite Adhesives Ltd., a subsidiary Company within the Expandite Group, has been formed to manufacture and market a range of Adhesives. The main emphasis will be on Adhesives for the Building, Civil Engineering and Metal Fabrication and Assembly industries. The Company will develop and manufacture Adhesives for special applications as required.

The Company will operate from office and factory premises at Birchley Street, St. Helens, Lancashire. Telephone: St. Helens 7376/7. Telex 25420.

B.S.I. News

Abstracts of information supplied by the British Standards Institution

NEW BRITISH STANDARDS

B.S. 3016 : —— Pressure regulators for use with butane/propane gases.

3016 : Part 2 : 1960 Low pressure regulators for use with propane gas. 4/6

B.S. 3178 : —— Playground equipment for parks.

3178 : Part 2 B : 1960 Special requirements for slides. 6/–

B.S. 3178 : Part 3 A : 1960 Special requirements for swinging apparatus. Section A. Pendulum see-saws. 4/–

B.S. 3208 : 1960 Methods of test and rating for hot-water air-heater batteries. 7/6

Specifies a method of test for hot-water air-heater batteries. It describes the equipment required, gives instructions for the calculation and interpretation of results, and includes procedures for dealing with special cases.

B.S. 3212 : 1960 Flexible tubing or hose (including connections where fitted) for use in butane/propane gas installations. 10/–

B.S. 3213 : 1960 Hospital pressure sterilizers for water. 6/–

B.S. 3214 : 1960 Plugs and locking sockets for electric battery vehicles and trucks (300 ampere rating). 4/6

Applies to plugs and locking sockets intended for use in charging batteries for electrically propelled vehicles and also for main traction current duties with a continuous maximum rating of three hundred amperes and with a maximum voltage of 125 volts. These fittings under normal service conditions are for use on extra-low voltage, i.e. not exceeding thirty volts a.c. or fifty volts d.c., and no earthing connection is required.

B.S. 3215 : 1960 Glass urine bottles for male use. 3/–

B.S. 3219 : 1960 Horizontal cylindrical hospital sterilizers, pressure steam type. 6/–

B.S. 3220 : 1960 Horizontal rectangular hospital sterilizers, pressure steam type. 6/–

REVISED BRITISH STANDARDS

B.S. 397 : 1960 Primary cells and batteries. 15/–

Applies to primary cells and batteries of the Leclanche and mercury types for general industrial and domestic uses, and for domestic radio receivers and hearing-aids.

Battery and cell designations, nominal voltages, dimensions and performance requirements are specified together with terminal and socket positions.

Details of certain components, such as dimensions and materials of jars, electrodes and depolarising elements, and of the electrolyte for wet cells are also specified.

This Standard supersedes B.S. 966 : 1951, Batteries for valve type hearing-aids and B.S. 1766 : 1951, Dry batteries for domestic and radio receivers, which are now withdrawn.

B.S. 1017 : —— Sampling of coal and coke.

1017 : Part 1 : 1960 Sampling of coal. 25/–

Methods of sampling and sample preparation are detailed for coal and are summarised in an appendix. Other appendices describe methods of assessing sampling accuracy, give recommendations on the procedure for sample preparation, and present evidence in support of the principles stated.

B.S. 1017 : Part 2 : 1960 Sampling of coke. 25/–

Methods of sampling and sample preparation are detailed for coke and are summarised in an appendix. Other appendices explain the collection and use of statistical data on sampling and describe methods of sampling for special purposes.

B.S. 1129 : 1960 Timber ladders, steps and trestles. 6/–

Gives requirements for standing, builders' step and extending ladders suitable for the building and civil engineering industries.

Detailed dimensions and test requirements are given for each type of ladder together with general finish and marking.

B.S. 1270 : 1960 Schedule for electric discharge lamps for general purposes. 5/–

B.S. 1542 : 1960 Equipment for eye, face and neck protection against radiation arising during welding and similar operations. 5/–

STANDARDS WITHDRAWN

B.S. 966 : 1951 Batteries for valve-type hearing aids

B.S. 1766 : 1951 Dry batteries for domestic radio receivers

The above two standards have been withdrawn on the issue of B.S. 397.

AMENDMENT SLIPS

Please order amendment slips by quoting the reference number (P.D.....) and not the B.S. number.

	Ref. No.
B.S. 4 B : 1959 Broad flange beams, universal beams and column sections. Amendment No. 1	PD 3606
B.S. 587 : 1957 Motor starters and controllers. Amendment No. 2 (superseding Amendment No. 1)	PD 3628
B.S. 775 : 1956 Contactors when supplied separately or in combination with other gear. Amendment No. 2	PD 3630
B.S. 822 : —— Terminal markings for electrical machinery and apparatus.	
Part 3 : 1959 Terminal markings for power transformers. Amendment No. 1	PD 3608
Part 4 : 1959 Terminal markings for indicating and graphic-recording instruments. Amendment No. 1	PD 3609
B.S. 922 and 1691 : 1959 Electrical refrigerators and food freezers for household use. Amendment No. 1	PD 3610
B.S. 1782 : 1951 Hose couplings other than fire hose couplings. Amendment No. 3	PD 3659
B.S. 1972 : 1953 Low density polythene tube for cold water services. Amendment No. 4	PD 3662
B.S. 1973 : 1953 Low density polythene tube for general purposes including chemical and food industry uses. Amendment No. 4	PD 3663
B.S. 2050 : 1958 Electrical resistance of conductive and anti-static rubber products. Amendment No. 1	PD 3655
B.S. 2692 : 1956 Fuses for alternating current circuits above 660 volts. Amendment No. 2	PD 3625
B.S. 2990 : 1958 Rationalized and unrationalized formulae in electrical engineering. Amendment No. 1	PD 3677
CP 327.402 : 1951 Staff location systems. Amendment No. 3	PD 3661

DRAFT STANDARDS CIRCULATED FOR COMMENT

Draft Standards are liable to modification before adoption and issue as British Standards. Comments on the draft are welcomed. If received within one month of the issue of this list they will be taken into consideration before the publication of the standard, otherwise, they may have to await the next revision of the standard. A copy of any of the following drafts can be obtained by subscribing members free of charge on application to the B.S.I. To non-members the price is 3s. 6d. a copy up to 20 pp.: over 20 pp., 5s.

A 4849 Non-reversible connectors for portable electrical appliances. [2 pp.]

A 4850 Non-reversible connectors and appliance-inlets for portable electrical appliances (for circuits up to 250 volts and 13 amperes). [12 pp.]

A 5076 Polythene splints and appliances for external orthopaedic use. [10 pp.]

A 5414 Halsted's mosquito forceps. [4 pp.]

A 5415 Peters' aural specula. [4 pp.]

A 5462 Flexible urethane foam components for transport. [11 pp.]

A 5554 Specification for safety isolating transformers for industrial and domestic purposes. [49 pp.]

A 5717 Pressure steam sterilizers of small size (electrically heated) for unwrapped instruments and utensils. [11 pp.]

A 5853 Electrical resistance of conductive and anti-static products made from flexible polymers. [12 pp.]

A 5974 Performance requirements for electrically heated sterilizing ovens. [6 pp.]

TWO NEW STANDARDS FOR STERILIZERS

Hospital sterilizers: Horizontal cylindrical pressure steam type

Hospital sterilizers: Horizontal rectangular pressure steam type

B.S. 3219 for horizontal cylindrical sterilizers deals with six sizes ranging from 14 in. to 30 in. diameter and B.S. 3220 for horizontal rectangular sterilizers deals with four sizes, the smallest of which is 26 in. × 26 in. × 26 in.

The new standards specify requirements for the following types of equipment:—

(*a*) *Dressings sterilizers*—primarily intended for dealing with dressings and equipment made of rubber (e.g. gloves), or for general use. They operate with saturated steam at a maximum working pressure of 32 lb./sq. in. gauge (136·0° C.) (276·7° F.) and, additionally, at a lower pressure as required by the purchaser. Means are provided for a negative pressure (vacuum) to be produced in the chamber before the admission of steam, and for drying the load after sterilization. The requirements provide for the fully automatic control of dressings sterilizers.

(*b*) *Instrument and utensil sterilizers*—operating with saturated steam at a maximum working pressure of 32 lb./sq. in. gauge (136·0° C.) (276·7° F.). Air is removed by means of downward displacement but means may be provided for negative pressure (vacuum) to be produced in the chamber for drying the load after sterilization.

(*c*) *Sterilizers for bottled fluids*—operating with saturated steam at a maximum working pressure of 20 lb/sq. in. gauge (1·40 kg./sq. cm.). Air is removed either by downward displacement or by the production of a negative pressure (vacuum) in the chamber before the admission of steam.

Although the types of sterilizer dealt with in this standard may be installed in operating suites, they are normally installed sufficiently remote from anaesthetizing areas in the operating theatre and anaesthetic room to be outside the zone of explosion risk. Consequently precautions against this risk are not provided as a normal requirement, but are included as an additional requirement, and compliance with these special conditions should be specified when sterilizers or associated components are to be installed within the zone of risk associated with the use of inflammable anaesthetic gases and vapours.

These specifications provide only for equipment supplied with steam from an independent source. Provision has been made throughout the standard for safe and satisfactory design; nevertheless, as much latitude as possible has been allowed to the individual sterilizer manufacturer to enable him to incorporate his own ideas.

FLEXIBLE TUBING OR HOSE (INCLUDING CONNECTIONS WHERE FITTED) FOR USE IN BUTANE/PROPANE GAS INSTALLATIONS

This new publication (B.S. 3212 : 1960) (13 pp., 5 diagrams) specifies performance and test requirements for flexible tubing or hose—including connections, where fitted—for use in butane/propane gas installations. The following types of product are provided for:—

(*a*) Plain rubber, synthetic rubber or plastic tubing.

(*b*) Composite tubing and connections.

(*c*) High pressure, flexible tubing (including connections, where fitted).

Among the tests which the tubing is required to satisfy are those relating to: extent of increase in outside diameter under pressure; strength, adhesion and stretch; performance when " kinked "; resistance to gas, crushing and weather-cracking (ozone test).

" B.S. 3212 " is one of the marks required to be clearly and durably marked on all flexible tubing. Manufacturers who are licensed to do so may apply also B.S.I.'s nationally-known monogram—the " Kitemark."

Individual gas distributors and tubing manufacturers, the National Caravan Council, the Gas Council and the Society of British Gas Industries were among many organizations whose experts contributed to the preparation of this specification.

BRITISH STANDARD FOR PRESSURE REGULATORS FOR USE WITH PROPANE/BUTANE GAS

Part 2. Low-pressure regulators for use with propane gas

An important feature of this new British Standard (B.S. 3016 : Part 2 : 1960) is the emphasis it places on the testing of low-pressure regulators for propane gas. Propane is a highly inflammable gas used for cooking and heating and it is all-important that any appliance used with it should be safe.

The standard specifies the materials and construction of single or second-stage regulators for propane in the vapour phase up to 20 in. w.g. pressure (510 g./sq. cm.). Tests are included to make sure the regulator is sound, and that the materials are able to stand up to the conditions they are likely to meet.

The regulator should carry the manufacturer's mark, the month and year of manufacture, the maximum rated capacity and the British Standard number. Manufacturers licensed to do so only may apply B.S.I.'s " Kitemark " monogram.

On the Market

A Review of new equipment and materials and their development

NEW HYDRAULIC WHEELCHAIR

After 12 months of further experimenting and re-designing, a London garage proprietor whose wife was crippled by polio, has perfected a hydraulic wheelchair that will help thousands to rehabilitate themselves and live a fuller life at home.

Originally designed in Dexion slotted angle to facilitate rapid and easy modification, the "Workachair" is now being made in tubular steel.

The chair has a hand or electric operated pump mechanism which can be placed on either side to suit the patient, and gives a lift of 10 in. from ordinary dining room chair level. The seat, armrests and backrests rise in one unit, enabling the user to carry out everyday household tasks.

One armrest drops down to facilitate easy moving of the patient from wheelchair to armchair or bed.

As the chair pivots on its own axis it can be used in confined spaces and is uncapsizable.

Because of the chair's lightweight design the patient can be carried up or down stairs while seated.

A folding table which can be moved to different positions can also be supplied for fitting to the armrest.

Mrs. Anderson demonstrates the drop-side of the "Workachair."

Mr. Anderson invented the "Workachair" when his wife, Irene, 43, returned from hospital, paralysed by polio from the waist downwards.

Using the chair Mrs. Anderson is able to do everything from making beds and cooking to ironing and laying the fire. She can raise or lower the seat to any position for reaching shelves normally out of reach, or for picking up objects from the floor.

Further information from **Workachair Enterprises Ltd.**, 6, West Hampstead Mews, London, N.W.6.

"ELLISCOPE" INDUSTRIAL POCKET MICROSCOPE

To meet the need for precision which present-day attention to detail demands, Ellis Optical Co. have designed and produced a high powered pocket microscope which has optically worked lenses and has a magnifying power of from 20 times up to 40 times.

Magnification can be increased by extending the sliding tube and correct focusing is easily obtained by adjusting the knurled ring.

The circle of field is approximately half-an-inch.

Easy to handle—in size little more than the average pen—it is priced at 45s. Further particulars may be obtained from the manufacturers: **Ellis Optical Co.**, Mayday Road, Thornton Heath, Surrey. Thornton Heath 3601.

PRIMER TREATMENT FOR ALUMINIUM

Aluminium is a difficult metal to paint. Because of its smooth surface, its natural lack of "key" has always presented a problem of adhesion.

To help the adhesion of the primer coat, the surface of the aluminium has in the past been etched by one of the expensive pre-treatment processes or roughened by the extensive use of an abrasive. Chemically active primers have replaced these expensive methods but, because of the chemical effect of etching acid on varnish mediums, most of the primers offered have been two-can systems, the two components having to be mixed together just prior to painting.

One of the first etching primers to be produced ready for use in a single can was developed by **Federated Paints Ltd.** The latest version of this product is Strathclyde Etching Primer PA-10. No

special preparation of the metal surface, other than normal cleaning, is necessary yet a single coat of PA-10 is said to give an adhesion of over 3,000 lbs. per square inch. The primer is fully pigmented to provide a barrier against the corrosion and weathering of the aluminium surface.

In the new P. & O. Liner *Canberra* much of the superstructure has been fabricated with aluminium and Strathclyde Etching Primer PA-10 was selected for the priming coat. It is also approved for use on aluminium by the Admiralty.

Fuller details and sample tins for test purposes will gladly be supplied by the manufacturers, Federated Paints Ltd., Dobbies Loan, Glasgow, C.4.

CLIFFORD PARTITIONING

The latest innovation from **The Clifford Partitioning Company Ltd.,** of 240, Burlington Road, New Malden, Surrey, who are well known for their inexpensive wooden partitioning, is a cheaply priced single-skin partition with special pre-formed ducting for electrical cables. This special ducting, being built-in before erection, enables electrical installations and connections to be installed or altered in completed partitioning. A considerable saving of time can thus be effected.

By this new method the partitioning is first erected and the electricians are then able to carry on with their installations without further hindrance or waiting for partitioning sections to be put in place. As a means of inspection of cables and periodic alterations to lighting circuits, this new system shows obvious advantages.

Power or lighting cables can be run through ducting at either the top or bottom of the partitioning: in the former case a special cut-out is provided in the top rail and, in the latter, a special cable run is set into the floor rail. Where vertical wiring is required, i.e. for switches, etc., special twin panel sections are provided which incorporate a vertical wiring run from which leads can be taken at any required point.

The exterior appearance of this partitioning is the same as the Standard Clifford Partitioning.

THE " FRIGOSTERIL " ELECTRIC DRY STERILIZER

A sterilizer is to be newly imported into this country from Germany and an agency is being set up for the purpose. It has been manufactured on the Continent for some years.

Capable of operating up to a temperature of 200° C., it reaches this in 8 minutes. Control is automatic and the sterilizer is designed to provide sterile instruments in the shortest time.

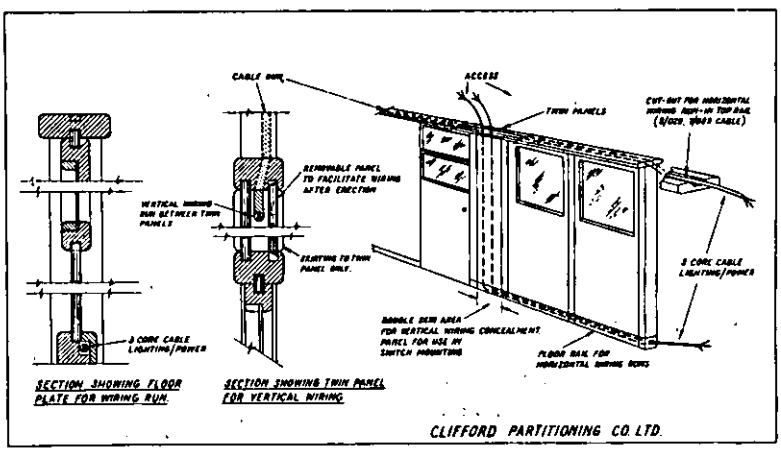
Five sizes of machine are available and the larger sizes are fitted with a filter door to facilitate the speedier cooling of sterilized articles. For this purpose, the motor continues to run when the heat is switched off and cool air is drawn through the filter door, allowing aseptic cooling after sterilization. The filter is located in the sterilizing compartment and is itself sterilized at each operation of the apparatus.

The maximum consumption of the largest unit during heating up is 4 kW., reducing to 1·4 kW. during continuous operation, and units are available for all voltages.

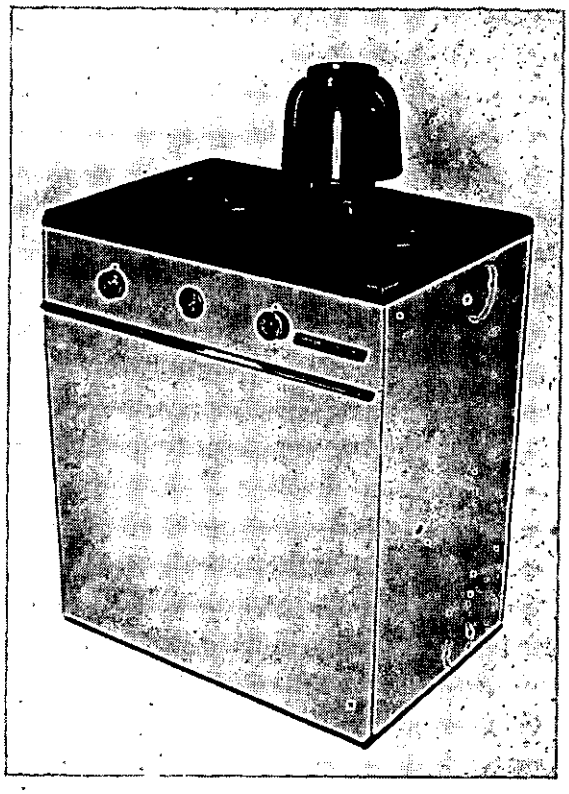
At the time of going to press, establishment of the Agent's London office is incomplete but enquiries addressed to this JOURNAL will be forwarded.

NEW WILSON BOILERS

A new range of " Oilheat " vaporising oil-fired boilers for the smaller central heating systems which



Details of the new Clifford Partitioning design showing provision for cable runs.



The new " Oilheat " Model 70.

embody a number of new technical and design improvements, is being marketed by **Henry Wilson & Co. Ltd.**, Kirkby, Liverpool.

The four sizes—25,000, 35,000, 50,000 and 70,000 B.Th.U's capacities—cover a wider output range than previously with " Standard " and " De Luxe " models in each size.

The improved short drum burner and Teddington control are mounted on an adjustable tray which slides out of the cabinet for easy adjustment and servicing while the burner can itself be moved independently of this platform to ensure perfect alignment of the oil-level setting.

An asbestos sealed door on the combustion chamber prevents any possibility of fumes escaping while a larger removable plate on the top of the boiler means that the vertical tubes of the all-welded steel boiler can be easily reached for cleaning.

The possibility of airlocks has been eliminated by a fixed metal pipe from the Teddington control to the burner and a flexible pipe from the oil inlet to the control while a new-type flue breach also has an access plate for easy cleaning.

The larger units—Models "50" and "70" — have twin burners and boilers which can act either separately or jointly to give maximum flexibility and heat variation.

NEW HODGKINSON ELEVATOR

The latest development of **James Hodgkinson (Salford) Limited** is the High Speed Screw Elevator. It has been designed primarily for handling boilerhouse smalls where for one reason or another it is not convenient, or possible, to prepare a concrete ground hopper or pit. For feeding the hoppers of " Low Ram," Chain Grate or Underfeed Stokers under such circumstances it is ideal.

The elevator consists of a steel tube in which rotates a worm housed in totally sealed, self-aligning ball bearings and driven by a constant speed, totally enclosed motor mounted on a platform at the head of the casing. A short standard chute extends from the head to which an additional section or breeches piece can be added, provision being made for this to be swivelled to suit site conditions. At the tail the worm is exposed for the entry of coal. An adjustable device enables the head to be supported from any convenient structure in the boilerhouse.

Each unit will handle up to 1½ tons of smalls per hour and feed direct to the stoker simply by resting the tail on a pile of coal and lifting the head into position over the stoker hopper. The elevator is entirely self-cleaning and no running maintenance is required since the bearings are grease packed and sealed for life. Costly erection expenses and delays are eliminated—the machine can be working within half an hour of delivery.

The High Speed Screw Elevator is supplied in the following standard lengths: 13 ft., 14 ft., 15 ft., 16 ft., 17 ft., 18 ft.

NEW BELLOWS FLOWMETER CLAIMED TO BE MOST STABLE YET

A new bellows type flowmeter featuring automatic temperature and static pressure stabilising is introduced by **Honeywell Controls Ltd.** It is claimed to be the most stable in operation of its kind yet developed.

The new Bellows Flowmeter will operate efficiently with ambient temperatures between —40° F. and +250° F. It incorporates a rapid pulsation damping device.

The instrument, which is suitable also for liquid level measurement, has an accuracy of ±0·5 per cent full scale differential pressure. Positive overload protection is provided.

Fifteen different ranges from 0–20 inches water to 0–400 inches water are available; only the simplest component change is necessary for range changing. A large bellows system and torque tube assembly give high torque and power output for the operation of additional elements.

The flowmeter can be used in conjunction with integrally mounted or remote reading indicators, recorders or controllers. Automatic flow totalising on a six digit counter can also be incorporated.

The bellows and all parts of the bellows assembly exposed to fluid are of stainless steel, making the flowmeter suitable for use with almost any process fluid.

Ease of installation is assured by pressure connections for vertical and horizontal piping which can be positioned at either the top or the bottom with no change of parts.

Specification sheet S292-2a gives full details and is available on request from Honeywell Controls Ltd., Ruislip Road East, Greenford, Middlesex.

NEW OPAL LAMPSHADE FOR HOSPITALS AND SCHOOLS

Virtually unbreakable: can be washed in boiling water

A new type of opal lampshade has been introduced by **H. W. Field & Son Ltd.**, Harold Wood, Essex, for use in offices, hospitals, schools and commercial and industrial organisations. The new shades, which are made from Rigidex high density polyethylene supplied by British Resin Products Limited, are available in two sizes, 13 in. and 11 in. diameter, with a 4¼ in. hole in the top suitable for fitting to standard monkscap suspensions.

The shades are intended for use with ordinary tungsten lamps and give an even light distribution with no glare. The 13 in. size will accommodate lamps of up to 300 watts. They are available individually or as complete fittings with either a brass monkscap and P.V.C. suspension (any length) or a chromium-plated with a 2 ft. chromium tube suspension.

The lampshades are rigid and tough and have good resistance to chemicals, oils and greases. They have good heat stability and can be washed in boiling water. They are blow-moulded for H. W. Field & Son Ltd. by Lacrinoid Products Ltd.

Notes for Members

News of I.H.E. activities, etc., and items of interest from Branches

OBITUARY

Mr. H. E. Mitchell

We regret to announce the death on March 31st of Mr. Harold Ewart Mitchell of St. Anthony's, North Road, Tollesbury, Essex, at the age of 59.

Although not a member, Mr. Mitchell was a very good friend to the Institution and many past and present Members of Council will recall his hospitality on the frequent occasions when Council met at the National Hospital, Queen's Square. He was the guest of honour at the 1959 Annual Dinner.

Mr. Mitchell's first major appointment was as Chief Lay Administrative Officer at the Manchester Jewish Hospital. He saw service at Oldham Royal Infirmary and the Royal Hampshire County Hospital, Winchester, before going to St. George's Hospital, London. He moved to the National Hospital, Queen's Square in 1945. In 1959 he retired as Secretary to the Board of Governors as the result of ill health and became Secretary of the Chartered Society " Queen Square."

Mr. C. C. Gambles

We regret to announce the death of Mr. Charles C. Gambles on March 11th as the result of a heart attack.

Mr. Gambles, another good friend to the Institution, was an Honorary Member of many years standing. He will be particularly missed by London Branch at whose meetings he was a regular attender.

After completing his apprenticeship in the Engineering industry in Cardiff, he joined Foster Haines as a junior engineer and eventually rose to the rank of Chief Engineer.

During the last war Mr. Gambles was engaged on work for the Admiralty. He afterwards joined Messrs. Walker Crosweller. In 1948, he set up in business as a supplier of steam fittings, instruments and other equipment, and rapidly built up a substantial business trading as C. C. Gambles & Co.

MIDLAND BRANCH

A meeting of the Branch was held at Highcroft Hospital, Erdington, Birmingham, on January 30th. This is a large mental hospital and Mr. K. W. Ashton, Chairman of the Branch, is Superintendent Engineer to the Group.

Prior to hearing a paper, the Chairman held a short session to discuss a letter received from the South Wales Branch, a letter which had been sent to all branches, concerning the salary structure. The Midland Branch, after discussion, decided to

request Council to press for, through the proper channels, a fact finding committee to investigate the salaries of engineers in the Health Service and their relationship to others in the Service and in industry.

The Meeting then heard a most interesting and, in some respects, unusual paper—" The City of Birmingham Water Department Bye Laws "—their interpretation and implementation in respect of hospitals, by O. E. Rotheroe, Chief Inspector of the Water Department. Mr. Rotheroe had a large range of sample fittings with him and these were handed round.

After an adjournment for tea the Meeting resumed its formal business. The office of " branch chairman " was discussed and it was unanimously agreed that the appointment of Chairman be held for a period not exceeding two years, subject to his being prepared to stand for a second year and to his being re-nominated. When the Chairman relinquished office the Vice-Chairman would automatically assume the senior position.

Apart from the consideration of a number of applications for membership there was no other business.

YORKSHIRE BRANCH

The Yorkshire Branch held a meeting at the General Hospital, Knaresborough, on February 13th.

Members heard a paper—" The Industrial Regulations as applied by the Clean Air Act " by E. M. Birtwistle, Chief Public Health Inspector to the Horsforth U.D.C. This proved both interesting and enlightening.

In addition to a Council meeting report, members discussed a proposal that the Branch should sponsor a two-day school to coincide with the Annual Conference. (As reported in our March issue, the idea was subsequently abandoned.)

LANCASHIRE BRANCH

A meeting of the Branch was held at Hope Hospital, Salford, on February 13th.

The meeting considered correspondence and a number of local matters before turning to the outcome of the industrial court findings. A prolonged debate ensued and considerable criticism of the Institution's negotiators was reported by Mr. H. Roberts in a written report of Council. Mr. Roberts criticised what he described as the continued lack of information made available to members, and the manner in which Officers were elected.

In regard to hospital development, Mr. Norris expressed the opinion that more frequent opportunities should be arranged for exchanges of views amongst those concerned with the various engineering problems. This would help to avoid some of the pitfalls and encourage the inclusion of desirable features.

WEST OF ENGLAND BRANCH

A meeting of the Branch was held at the Royal United Hospital, Bath, on February 20th.

The Chairman, Mr. R. L. Hanks, welcomed Mr. F. Holly, Regional Engineer, and Mr. R. Hamilton, Deputy Regional Engineer, and other members of the Regional Board's Engineering Staff, who had attended to take part in the discussion on unattended automatic oil fired boilers.

The Chairman opened the discussion by reading a summary of the points raised at the previous meeting, a report by Mr. C. F. McBurnie of the working of the plant at Barnwood Hospital, and a list of advantages and disadvantages by members. The requirements of the Associated Offices Technical Committee for the Insurance of automatically controlled steam boilers were also referred to.

A long discussion followed during which it was evident that all present were fully aware of the need to maintain high standards of safety in all boiler houses and also the need to fully safeguard against loss of services to hospitals, particularly General Hospitals where loss of steam can have serious consequences. These two factors are, of course, the prime considerations, but other factors discussed were the need for more time to be spent on the plant by skilled men, the increasing demands on the services of the Hospital Engineer to attend to failures of control gear which could not be rectified by the Boiler House attendent, and also the relative economics of converting existing plant to automatic control as against installing new plant designed for operation with automatic controls.

It was generally agreed in principle that no plant should be left completely unattended for safety reasons, and that the frequency of visits to plant not fully attended should be dependent on the nature of the hospital and on the complexity of the plant, qualifications of the attendent staff and the efficiency of any alarm system incorporated in the control gear.

Following the discussion Mr. Holly referred to a suggestion that Insurance of Engineering equipment should be considered on a Regional contract basis. Members felt that, as hospital plant was insured mainly to obtain the services of fully qualified inspectors as required by the Factories Act, any insurance business contemplated should only be placed with firms with the necessary technical resources. It was agreed that the suggestion offered many advantages. One member suggested that the Regional Board might consider setting up its own Inspection Department.

(*Continued from page A.30*)

MID-WORCESTERSHIRE
HOSPITAL MANAGEMENT COMMITTEE

Blakebrook Hospital, Kidderminster

Applications are invited for the post of ASSISTANT ENGINEER (Non-Resident) at the above Hospital. Salary on the scale £545 to £670 according to experience. Applicants should have completed their apprenticeship or training in Mechanical Engineering, and have a sound knowledge of the principles and practice of Boiler Plant, Engineering and Electrical Services generally. Preference will be given to persons possessing the Ordinary National Certificate in Mechanical or Electrical Engineering.

Applications, stating age, qualifications and previous experience, together with the names of two referees, to be addressed to the Secretary, Blakebrook Hospital, Kidderminster, Worcs.

HUDDERSFIELD HOSPITAL
MANAGEMENT COMMITTEE

Deanhouse Hospital, Thongsbridge, Huddersfield
(285 beds)

SENIOR ENGINEER REQUIRED immediately generally to assist the Superintendent Engineer and to be mainly responsible for the engineering and maintenance services at the above Hospital. Candidates must have completed an apprenticeship or a thorough practical training and be able to efficiently supervise steam boiler and laundry plants, electrical services and building maintenance and should possess one of the following qualifications or equivalent:—

- Ministry of Transport and Civil Aviation 2nd Class Certificate of Competency in Marine Engineering.
- Ministry of Transport and Civil Aviation Certificate of Service as 2nd Class Engineer.
- Ordinary National Certificate in Mechanical Engineering, including Heat Engines, endorsed in Principles of Electricity.
- Ordinary National Certificate in Electrical Engineering, with endorsement in Applied Mechanics and Heat Engines.

Engineers at present in Health Service posts with the necessary Service qualifications are eligible to apply.

Whitley Council conditions—salary scale £640 to £770 p.a. maximum. A house is available in the hospital grounds, and the successful applicant will be required to live at or near to the hospital.

Applications, with full particulars of age, qualifications and experience, together with the names and addresses of three referees, to be sent to the undersigned.

H. J. JOHNSON,
Group Secretary.

Huddersfield Hospital Management Committee,
Huddersfield Royal Infirmary.

SERVICES CLERK OF WORKS
FOR OXFORD UNIVERSITY

Applications are invited for the position of a Mechanical and Electrical Services Clerk of Works in connection with two new building projects.

The buildings, one of which is an Engineering Laboratory, the other a Biochemistry Laboratory, will take approximately two years to complete and will be provided with full range of mechanical and electrical services.

The successful applicant must have experience and knowledge of mechanical and electrical services in modern technical buildings and their relation to the structure and finishes of the building. He will be expected to co-ordinate on site under the direction of the Architects and Consulting Engineers, the various mechanical and electrical sub-contractors and organise the work to fit in with the Main Contractor's programme.

Salary scale £800/£1,000 according to qualifications and experience. Applications should be made in writing, giving full details of all experience and qualifications to: Steensen, Varming & Mulcahy, Consulting Engineers, 146, New Cavendish Street, London, W.1.

HUDDERSFIELD HOSPITAL MANAGEMENT
COMMITTEE

St. Luke's Hospital, Crosland Moor, Huddersfield
(235 beds)

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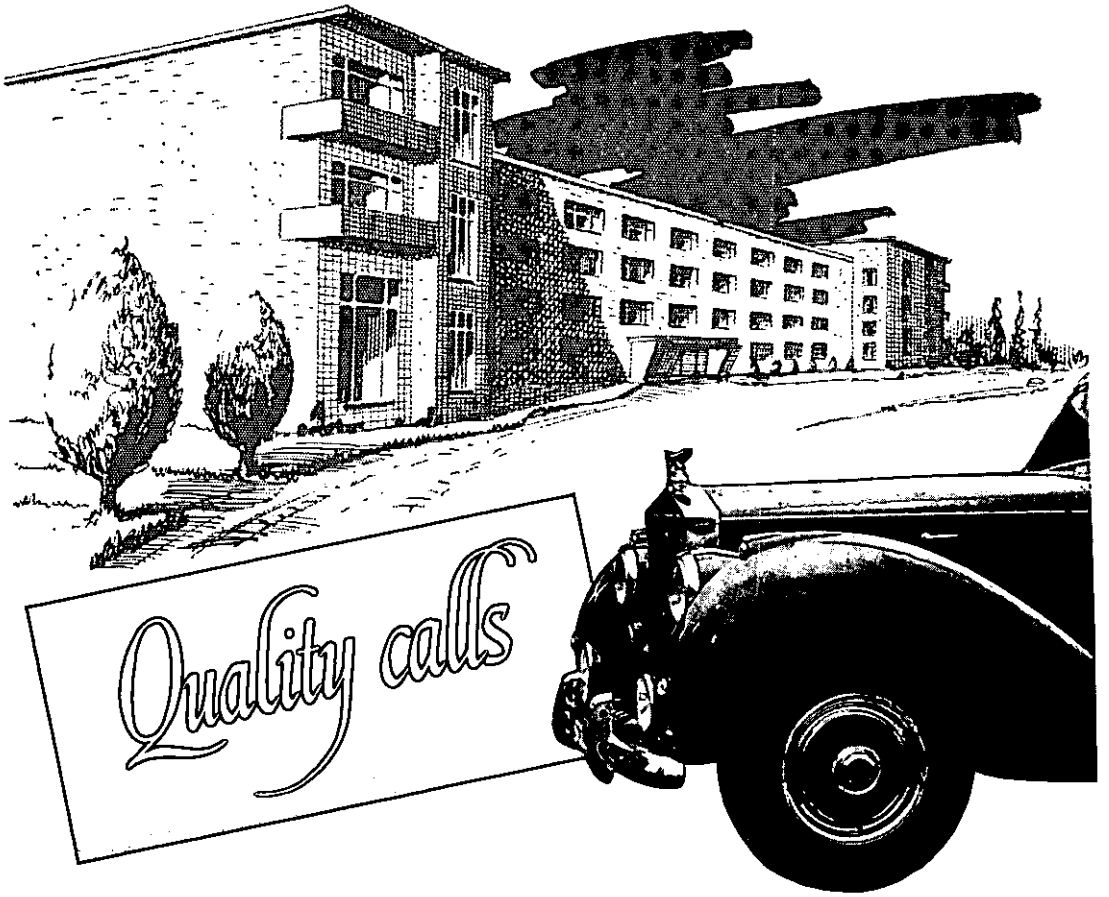

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