ELECTRICAL REVIEW

FOUNDED 1872

Vol. CXXXV. No. 3488 SEPTEMBER 29, 1944 9d. WEEKLY

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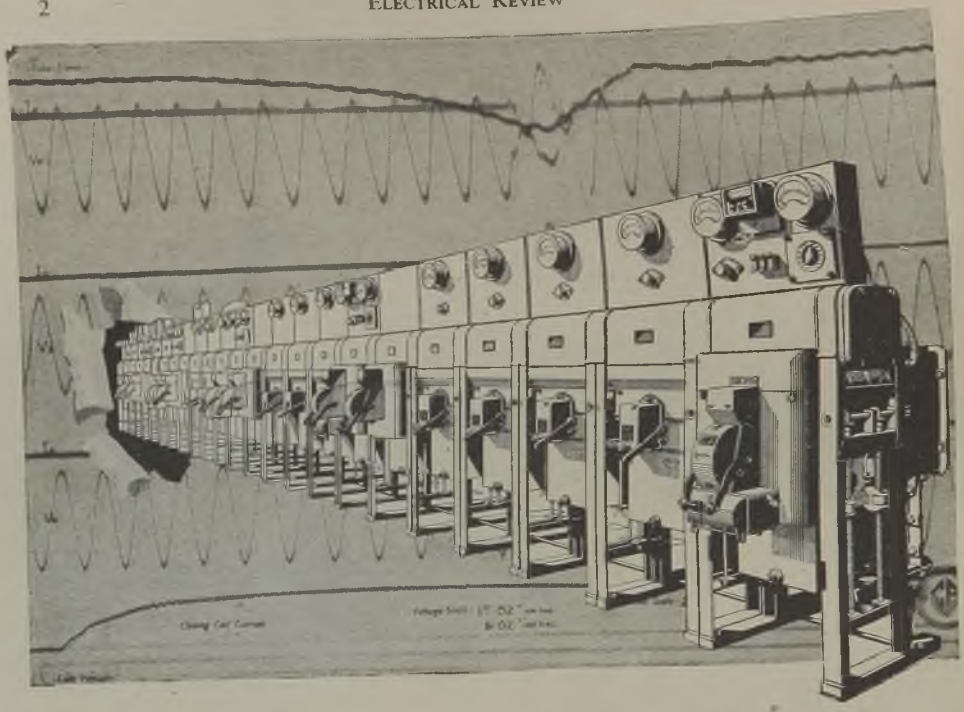

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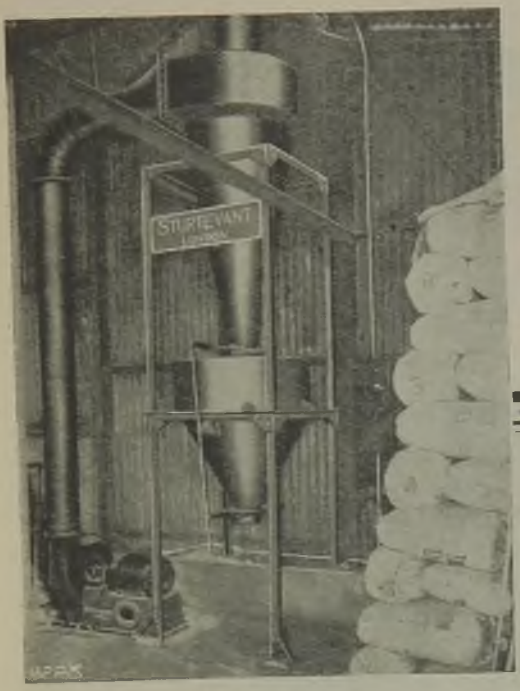

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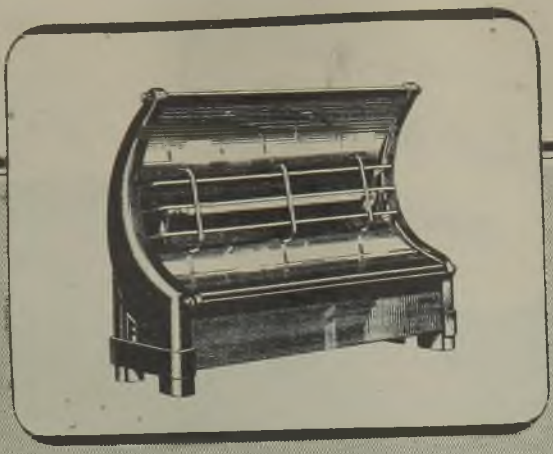

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As to the argument it must remain a mystery along with the Marie Celeste and Mr. Gladstone's earlier remark. But even to-day our Managing Director is sometimes heard muttering " He *did* say it, all the same."

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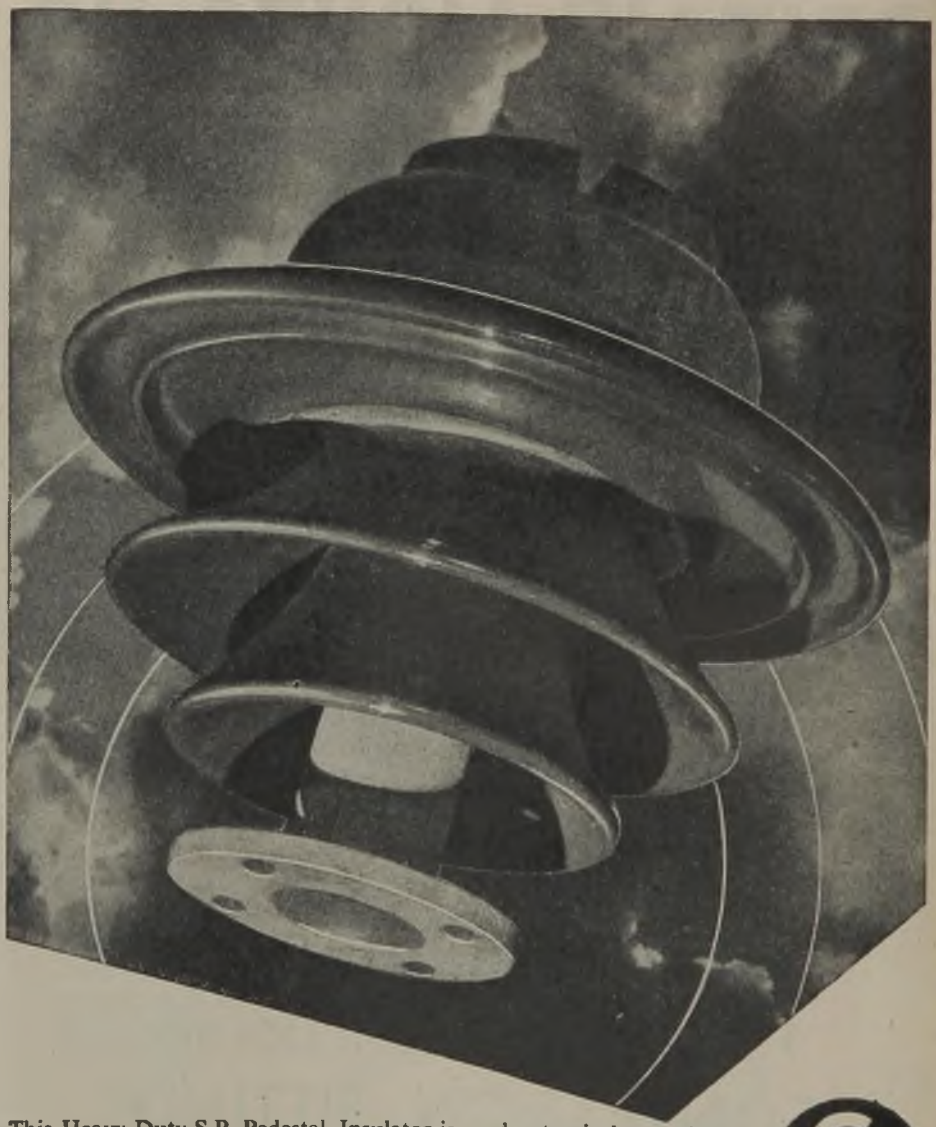

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ELECTRICAL REVIEW

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ELECTRICAL REVIEW

THE OLDEST ELECTRICAL PAPER — ESTABLISHED 1872

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"Reconversion" of Industry

American and British Attitudes

FURTHER details of the move towards the resumption of manufacture for civilian requirements in the United States have recently been made public. Makers of washing machines and other electrical appliances have been advised by the War Production Board to take advantage of the "reconversion" orders which it is issuing progressively so as to be ready for civilian production when man-power, materials and facilities become available.

Easing the Way

The Board has made four orders designed to ease the way to reconversion. These free aluminium and magnesium for civilian production which does not interfere with war output; allow manufacturers to make one working model of a product intended for post-war production; authorise manufacturers to place orders for machine tools and other equipment necessary for post-war production; and permit local W.P.B. offices to approve plans for civilian production which can pass rigid tests to prove that they will not hold up war work.

It has been emphasised by the Board that in no case will manufacturers who can safely go ahead be held up in order to give an entire industry a uniform starting date. Thus it seems that the more fortunate producers are likely to get a start over those who are still fully occupied with war orders.

In this country there has been an easing of wartime production in some directions but ostensibly any labour or materials thus released are being switched over to other war work. All the same, doubts have been expressed whether this policy is invariably followed. In a recent letter to *The Times*, Mr. W. C. Devereux, chairman and managing director of High Duty Alloys, Ltd., referred to the trend in the United States and alleged that reductions in the armament programme here were resulting in the standing-off of large numbers of men. This was inevitable as we changed from war to peace, for before the workpeople could be reabsorbed much development work would have to be done.

But, he complained, British manufacturers were allowed no draughtsmen or development engineers for use on any post-war application and very little material to do any development work at all. The Government Departments concerned should arrange that sufficient staffs and materials were available to industry to be utilised on design development, plant reorganisation schemes, jig and tool design, etc., so that when the time came the people put off from war industries could be found work in a reasonable time.

Little Sign of Preparation

Mr. Devereux seems justified in saying that as things are at present we look like entering the peace era with as little preparation as we entered the war. We can quite understand the Government's hesitancy to allow the country to think that the war is practically over. At the moment it seems that this may be true of the European side of it, but Japan remains to be dealt with. Nevertheless, there must be some better indication of the Government's intentions with regard to the great change-

over than it has given so far. If steps are not taken immediately the cessation of war will bring not peace but chaos.

Re-allocation of Labour

A WHITE Paper (Cmd. 6548) has been presented to Parliament by the Minister of Labour and National Service setting forth the proposed arrangements for releasing men and women from the Services when the European war ends. As a great deal of attention has been given to the White Paper in the public Press it is sufficient to record here that the plan is for the "re-allocation" of man-power, *i.e.*, upon release from the Services men and women may still be required to take up civilian work of national importance. In fact, the release of men required for reconstructional purposes will be a direct transfer from the Forces to specified work.

Continued Control

ALL industrialists are wondering whether there will be any relaxation of Government control of man-power and supplies when Germany is defeated but Japan still remains to be finished off. The White Paper emphasises that this is not a plan for demobilisation but for "re-allocation" and states :—"It will also be necessary to maintain the requisite control over industry and labour during the interim period in which there will continue to be heavy and over-riding demands for munitions of war and other essential production." Much seems to depend upon the interpretation of the word "requisite." In this connection it may be noted that Mr. James F. Byrnes, U.S. Director of War Mobilisation, said recently that he estimated that after the defeat of Germany war requirements would be reduced by 40 per cent. Full protection would be given to the needs of the war with Japan while permitting a resumption of maximum civilian production without delay.

The Dnieper Dam

WHEN the Germans over-ran the Ukraine it was reported that the Russians, to deprive the enemy of the power from the Dnieper Dam, had put this great work out of action. It took the Germans about eighteen months to restore it and last autumn when they were being pushed out of Russia they again wrecked the equipment. But, says the Moscow special correspondent of *The Times*, they did not breach the dam, for the resultant flood would have destroyed bridges which they needed. Preparations for eventual total destruction were made, however, but these were negatived by the prompt action of Red Army patrols. Nevertheless substantial damage had to be repaired and this reparation is proceeding rapidly though much still remains to be done. The chief engineer of the undertaking, Mr. Kandalov, reports that the debris has now been fully cleared away and the rebuilding has made substantial progress.

Widespread Service

CO-ORDINATION has proceeded much further in electricity supply than in the gas industry, largely because of the more favourable distribution characteristics of electricity. That is one reason why any schemes for bracketing the two industries are looked on with apprehension by most electrical people. An instance of the superiority of electricity in this respect is afforded by the recent decision of the Fife County Council to make its kitchens all-electric. Gas suppliers in the county claimed that they could have given the Council a cheaper supply and protested because they were not asked to do so. The answer was that while it was true that some local gas concerns might have been able to do the job cheaper, taken over the whole area the Fife Electric Power Co. was in a position to give the best and cheapest service and it was therefore given the contract.

Choice of Services

IN this issue Mr. F. W. Purse returns to the topic of "freedom of choice" and criticises the Ministry of Health's Sub-Committee on the Design of Dwellings for its advocacy of solid-fuel methods as the basis of domestic heating and cooking services. The same idea is prominent in the "Housing Manual" referred to on another page ; in fact this manual is largely based on the Sub-Committee's recommendations. In spite of what Mr. Purse has said about the expense of providing duplicate services, the Manual contends with regard to gas and electricity that "where both fuels are available it may be possible at small cost to provide installations allowing either to be used." This follows a statement that "electricity will normally be used for lighting wherever

it is available " and a recommendation that from twelve to fourteen socket-outlets should be provided, as well as a separate circuit for an electric cooker. When the piping of the house and the provision of gas and electricity services are added to this the use of the term " small cost " may be questioned.

Post-War Power

THAT the post-war power requirements of industry and the home are now expected to be considerably in advance of what was thought likely a short time ago is indicated by the Central Board's decision to accelerate plant extensions. Only last year the Hull Corporation received a formal direction to complete extensions at Sculcoates in 1948 ; in April last it was instructed to get the work done two years earlier—by September, 1946. Following this Leeds Corporation has also been informed that it must finish the extension planned at Kirkstall (at a cost of nearly £2,000,000) by the end of 1946 instead of by 1948 ; Bolton has been instructed to install a 30,000-kw set, also by the end of 1946. Ipswich is building a new station and there are several others.

Public Ownership

AT its Blackpool conference last week the Electrical Trades Union called for " complete unified public ownership " of electricity supply as the only means of assuring " a cheap, adequate and sufficient [there seems to be a superfluous word here] supply of electricity." The general secretary (Mr. E. W. Bussey) showed that the union was against both of the existing sections of the industry. He said that the present system of municipal supplies was out of date and that a public service should not be in the hands of private capitalists. It is, of course, quite possible that public ownership might cheapen electricity for some people, but there is little sure ground for claiming that there would be a general reduction in prices. May this not be another triumph of hope over experience ?

Capital and Labour

IN most discussions of this question stress is laid by advocates of nationalisation upon the amount now paid in dividends and interest upon capital. It is perfectly true that the Government can raise money at lower rates than " private " companies (but not so much lower as compared with municipalities) so that as regards new expenditure there would be a saving. But the vast bulk of the capital of a national electricity supply body would represent the replacement of existing capital. If compensation were paid to the expropriated owners (and the Labour Party recognises that compensation must be paid) it would in fairness have to be such as to produce about the same return ; this and the gradual redemption of the stock or bonds would represent as great a burden as the present one for a good many years to come. As regards labour costs, it is unlikely that there would be any appreciable economy in labour and most certainly the unions would not countenance lower rates of pay. Perhaps the hoped-for saving would be realised in purchase of equipment and materials, but this is another matter in which data is too insubstantial to enable firm conclusions to be arrived at.

Incompatible Demands

As a footnote to the foregoing it is worthy of mention that the same conference passed a resolution supporting the miners in their claim for higher wages and the nationalisation of the mines. The electricity supply industry is already paying a great deal more for its coal than it did before the war. Without going into the merits of the miners' case (which may be a very good one) the E.T.U. may be asked how it reconciles its call for cheaper electricity with what is, in effect, its support for dearer coal.

Advance Agents

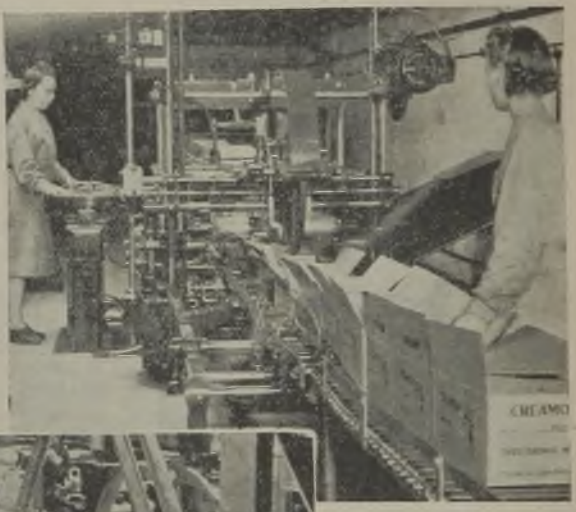
ALLEGATIONS have appeared in the Press to the effect that representatives of American exporting concerns have already set up offices in Paris for the commencement of business. Now the Supreme Headquarters, Allied Expeditionary Force, has announced that the Supreme Commander has directed that no transportation will be authorised for United Nations civilians to places in the forward zone for the purpose of opening offices for the conduct of private enterprises. The allegations that this policy has been violated are to be investigated. It is further stated by S.H.A.E.F. that when the forward zone ceases to be a military area the question of authorisation for the transportation of civilians and their subsequent supervision will be a matter for the representatives of the various Governments.

Carton Sealing

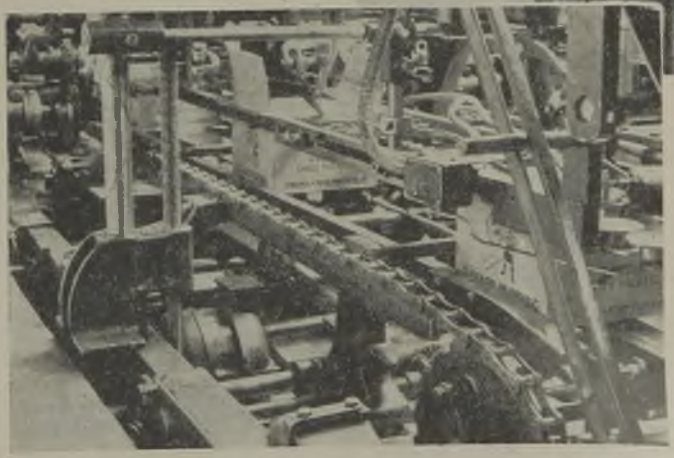
Unusual Selective and Sequence Control

BY the courtesy of Creamola Food Products, Ltd., we recently had the opportunity of inspecting at their factory in Glasgow a new installation for automatically handling (glueing and sealing) foodstuff cartons of various sizes. Electrically, the equipment is of particular interest as an outstanding example of both selective and sequence control. Selective control provides a very simple means of making the necessary adjustments for handling different sizes of cartons, and sequence control provides for running-up and shutting-down the different sections of the plants in the correct order, so as to prevent "jamming."

The equipment is generally described as a carton-sealing machine, but, from the viewpoints of selective and sequence control, it can be regarded as one special conveyor system with various handling and treatment devices at appropriate points in the system, such as we have referred to recently in articles describing modern methods of handling material more directly concerned with production.



The glueing section of the system is fed by a gravity conveyor; note width- and height-adjustment motors at top and control desk on left

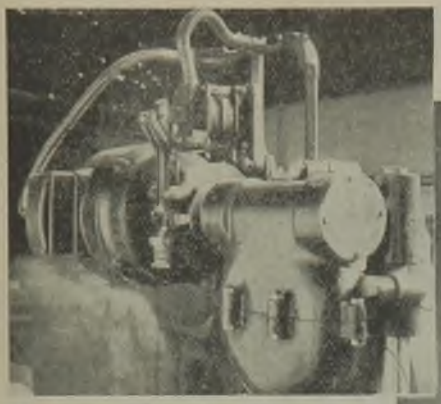


Both the belt and chain conveyors of the glueing section are driven by a 1-HP motor, bottom left; note the tripping switch situated at the entry to the compressor conveyor

As they pass through the system at the rate of 30 per minute the cartons are automatically glued and sealed at both the tops and the bottoms. The sizes of cartons dealt with range from 5 to 14 inches wide, from 3 to 21 inches high and up to 36 inches long, and while many sizes of cartons within these limits may pass through the equipment during quite a short period, the ease with which the necessary adjustments are made in the handling gear, to cope with the varying widths and heights, results in there being practically no interruption of the stream of cartons as the result of the change-overs. It takes about seven seconds to make the necessary adjustments to change from the smallest carton to the largest, and this is effected electrically as we shall describe later. The plant handles up to 8,000 cartons in 8½ hours.

Such a materials handling system can, of course, be regarded as consisting of almost any number of sections, but concentrating mainly on the electrical aspects, and to facilitate description, we

propose to view the plant in four main parts. These are the feeding section, in which the cartons are brought from the filling departments of the factory by a gravity

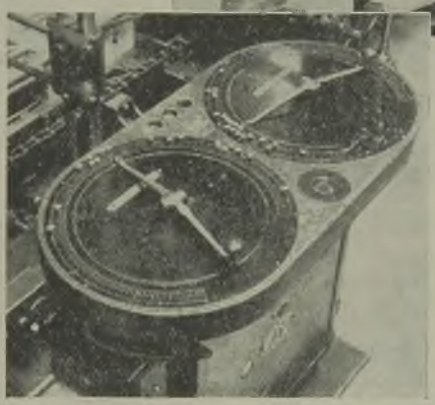


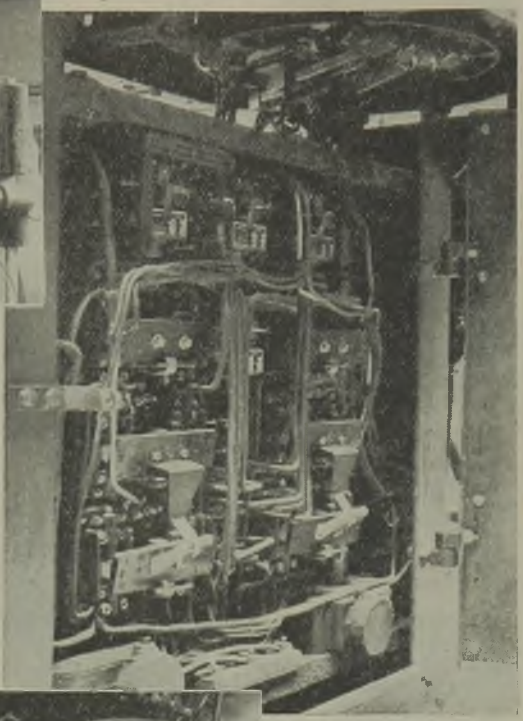
The width-adjustment motor transmits through worm gearing and is stopped by a magnetic brake

conveyor; the glueing section, in which the size adjustments are made and the glue is applied to the carton folds; the compressor section, in which the folds are held closely together during a comparatively long period of time and travel to effect satisfactory adhesion; and a delivery section, in which the cartons are conveyed to the packing departments.

In the glueing section there are two continuously running conveyors driven by the same 1-HP motor. One of these is a belt conveyor at the input end, which brings the cartons to the point where size adjustments, when necessary, are made. After being arrested and released by a tripping switch the front carton is passed on by a mechanically operated pusher, and the next carton is then brought up to the conveyor end and awaits handling in a similar manner—usually with an interval of about two seconds.

The chain conveyor which receives the cartons from the belt conveyor has bar carriers across it at about 4 ft. centres which register the positions of the cartons as they pass through the system. As the cartons pass on to this conveyor the two " flaps " or folds at both the top and the bottom of each are turned outwards through an angle of 180 deg., in which position, as the carton moves forward, the flaps make contact with glueing rolls which apply the necessary quantity of cold glue to each flap. The flaps are then automatically folded back again to their closed positions thus sealing the cartons.





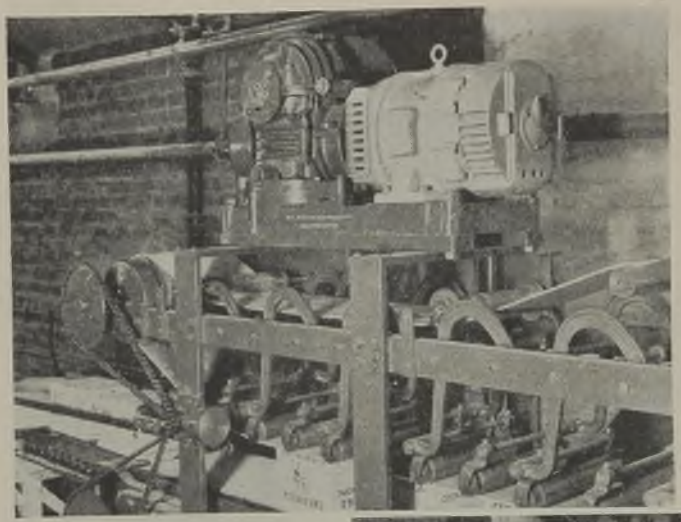
Above : The limit switches, contactors and other control gear are mounted on a panel in a cabinet under the selective dials
Left: Turning the pointers to the required pegged holes makes the necessary connections for the appropriate limit-switch operations

The adjusting gear for accommodating different sizes of cartons is also associated with this part of the plant, *i.e.*, the chain conveyor of the glueing section.

Operating on the mechanical " jaw " principle there are variable retaining jaws for both the width and height of the carton. The

width jaws are driven by a 3-HP motor and the height jaws are driven by a 1-HP motor. These two motors are mounted high up above the equipment on which are made. To make the necessary adjustment setting for a given size of carton all that is necessary is to insert the pegs numbered in accordance with the carton sizes in the appropriate holes and to turn the pointers at the dial surfaces to the pegged holes. The appropriate electrical connections for the adjustment-gear limit switches are made in this way. There are sufficient holes and pegs, of course, to cover the range of cartons likely to be used, and it is a very simple matter to make provision for new sizes of cartons within the range of the dials. At the moment, up to 20 different sizes of cartons are provided for.

The width and height adjustment motors are



Above: The 4-HP compressor conveyor motor drives two endless belts, one above and one below the cartons; spring-loaded rollers bear on the top conveyor

Right: A 1-HP motor driven inclined conveyor passes the cartons from the compressor conveyor to an idle roller conveyor in the packing department

the structural supports on either side, and they serve the mechanism which closes and opens the jaws *via* worm transmission. The operation in each case is governed by limit switches, the positions of which are selected by pointers at a special design of control desk. These limit switches are tripped when the appropriate positions of the jaws are attained by mechanical devices connecting the limit switches and the respective motions.

Surmounting the control desk are two circular setting or selective control dials. One dial is for the carton-width control, and the other for the height. The width dial is calibrated in $\frac{1}{16}$-in. steps within the limits already named, and the height dial is calibrated in $\frac{1}{8}$-in. steps. At each step or dimension there is a hole in the dial for the reception of a suitable peg, the holes and the pegs being marked with numbers denoting the various sizes of cartons controlled by mechanically interlocked reversing contactors mounted, with other control equipment for the whole plant, on a built-in control panel by the Igranic Electric Co., Ltd., in a cabinet under the selective dials. To effect quick stopping each of the motors is fitted with a 4-in. solenoid brake.

When each carton reaches the outlet end of the chain conveyor of the glueing section it operates the arm of a spring-return limit switch. This energises a starter serving a 4-HP motor that drives the compressor conveyor, which then picks up the carton. The carton retains hold of the spring-return limit switch just so long as is required for it to pass this device which, when released, breaks the motor circuit. The compressor conveyor motor is then quickly stopped by an 8-in. solenoid brake. It will be seen that the compressor conveyor motor is started and stopped every time a carton passes on to the compressor section, *i.e.*, thirty times per minute, representing quite a severe performance for the control gear.

The starting and stopping of the compressor conveyor at each carton entry ensures that the cartons are placed close together and that they are held under compression as long as possible on the conveyor.

The 4-HP driving motor transmits through a worm reduction gear to the end drum pulleys of two endless rubber belts, one below and one above the cartons. The upper length of the lower belt runs on 1·5-in. diameter idle rollers at 3-in. centres, and the cartons ride on this belt. The lower length of the top belt is pressed against the top of the cartons by means of heavy hinged spring-loaded rollers at 6-in. centres. The effective length of this conveyor is 50 ft., which length is dictated by the time required for the glue to set.

The contactor controlling the compressor conveyor motor is housed in the cabinet under the selective dials, as are also an "inch" button by which the conveyor can be cleared of cartons at the end of the day or run, and the necessary relay tripping gear by which the glueing section is shut down to prevent a "jam" in the event of the compressor conveyor motor failing. There are also limit switches which shut down the motors in the event of cartons of sizes larger than those represented by the size-adjustment settings passing on to the system.

When the cartons leave the compressor conveyor they are carried by a 1-HP motor-driven inclined conveyor to an idle roller conveyor in the packing department. All the motors are s.c. units with direct-on contactor control, and each is served by adjustable overload magnetic protection devices.

Work of the E.I.B.A.

Increased Activities During 1943

LAST year the Electrical Industries Benevolent Association moved back to London (32, Old Burlington Street, W.1). In mentioning this the annual report of the past year says that although, as in the case of previous moves, there was "a major substitution in staff," there was a further advance in income and activities.

The report stresses the fact that the Association covers cases which companies' own benevolent funds do not cater for. A number of examples are quoted, the moral being that the existence of a company's own fund should not prevent it from giving all possible aid to the E.I.B.A. A list of substantial donations made to the funds during the year shows that a large number of electrical companies appreciate this point of view. This same list contains the names of many individual benefactors and several electricity supply authorities (company and municipal).

During the year assistance was afforded in 184 cases affecting, with dependants, 370 people. Of these 49 cases (100 people) were entirely new ones. The amount paid out in grants, pensions and allowances increased by £859 to the record figure of £10,599. Reference is made to the good response made to appeals by their associations by members of B.E.A.M.A., the E.C.A. and the E.W.F. Paper salvage brought in £440, raising the total received from this source to £556. Credit is given to the effects of the president (Mr. E. E. Hoadley) in securing a greatly

Mr. J. N. Stephens, president of the E.I.B.A., and (right) Mr. L. C. Penwill, chairman of the Court

increased revenue from electricity supply authorities and emphasis is laid upon the results obtained from collections at electrical functions which the Association would like to see more widespread. The total revenue for the year rose from £16,206 to £21,528.

Presiding at the annual meeting on September 21st, Mr. Hoadley said that in 1935 the amount paid out by the Association was £2,900 ; in 1943 it was £10,600. The work was carried out in a most effective and humane manner. He looked forward to the

day when the Association would have homes for old people and the convalescent, with all desirable amenities. This could only be brought about if the industry understood the great work which the Association was doing and increasingly supported it. Mr. Hoadley paid a tribute to the voluntary helpers all over the country and to the secretary.

Messrs. W. N. C. Clinch, V. W. Dale and W. C. Yuille were appointed to the Council and at a subsequent Council meeting Mr. J. N. Stephens (who has been chairman of the Court for the past six years) was unanimously elected president. Mr. Stephens proposed a vote of thanks to the retiring president, Mr. Hoadley, and gave figures showing the large increase which had taken place in the contributions from supply undertakings during his period of office. Mr. Hoadley's untiring energy and unfailing cheerfulness in face of all wartime difficulties had been a tonic to all, and the industry owed him a deep debt of gratitude. At the meeting of the Court which followed Mr. L. C. Penwill was appointed to succeed Mr. Stephens as chairman, with Mr. L. C. Sharp as vice-chairman. Mr. J. Y. Fletcher was re-elected honorary treasurer.

I.E.E. Meetings

Programme for First Half of Session

DETAILS of the ordinary, informal and Section meetings to be held in London are given in the programme issued by the Institution of Electrical Engineers for the first half of the 1944-45 session. Dates are also included for later meetings. As last year, the meetings are timed to commence at 5.30 p.m., with tea available at 5 p.m. The arrangements are as follows:—

Ordinary Meetings.—Thursdays.

October 5*th.*—Inaugural address of Sir Harry Railing, D.Eng., as President.

November 2*nd.*—Paper: "Electrostatic Precipitation of Dust from Boiler-Plant Flue Gases," by Mr. J. Bruce.

December 7*th.*—Paper: "Standardisation and Design of AC Turbo-Type Generators," by Mr. G. A. Juhlin.

For the second half of the session the dates of meetings are February 1st, March 1st, April 5th, April 26th (Kelvin Lecture by Sir Edward V. Appleton, K.C.B.) and May 10th (annual general meeting).

Informal Meetings.—Mondays.

October 23*rd.*—Discussion on "The Engineer's Part in Certain Post-War Problems," to be opened by the President.

November 20*th.*—Discussion on "The Effect of Welding on Electricity Supply," to be opened by Mr. H. G. Taylor, D.Sc.(Eng.).

January 22*nd.*—Discussion on "Applications of Electricity to Water Supply," to be opened by Mr. J. F. Shipley.

Later meetings are on February 26th, March 26th and April 23rd.

Installations Section.—Thursdays.

October 12*th.*—Inaugural address of Mr. G. O. Watson as chairman.

November 9*th.* — Paper: "Electrical Accessories for Domestic Purposes; Notes on their Design and Installation," by Mr. F. C. Fuke.

December 14*th.*—Paper: "Organisation of Industrial Electrical Maintenance," by Mr. J. C. B. Nicol, B.Sc.(Eng.).

Dates of other Installations Section meetings are February 8th, March 8th, April 12th and May 3rd.

Measurements Section.—Fridays.

October 20*th.*—Inaugural address of Mr. W. G. Radley, Ph.D.(Eng.), as chairman.

November 17*th.* — Paper: "Planning the Future Electricity Meter," by Mr. G. E. Moore.

January 19*th.*—Paper: "The Fixing of Confidence Limits to Measurements," by Mr. H. J. Josephs.

Later meetings of the Section have been fixed for February 16th, March 16th, April 20th and May 18th.

Radio Section.—Wednesdays.

October 11*th.*—Chairman's inaugural address by Mr. H. L. Kirke.

October 25*th.*—Paper: "The Development of Polythene as a High-frequency Dielectric," by Prof. Willis Jackson, D.Sc., D.Phil., and Mr. J. S. A. Forsyth, B.Sc.

November 1*st.*—Papers: "Theory and Performance of Corner Reflectors for Aerials," by Mr. E. B. Moullin, M.A., Sc.D. "The Measured Performance of Horizontal-Dipole Transmitting Arrays," by Mr. H. Page, M.Sc.

November 21*st* (Tuesday).—Discussion on "New Aspects of Post-War Interference Suppression," to be opened by Mr. P. R. Coursey, B.Sc.

December 6*th.*—Paper: "The Measurement of Balanced and Unbalanced Impedances at Frequencies near 500 Mc/s and its Application to the Determination of the Propagation Constants of Cables," by Mr. L. Essen, B.Sc., Ph.D.

December 19*th* (*Tuesday*).—Discussion on "The Sound Channel in the Television Receiver."

January 16*th* (Tuesday).—Discussion on "Frequency Allocation for Long-Distance Communication Channels."

Other meetings have been arranged for February 7th, February 20th (Tuesday), March 7th, March 20th (Tuesday), April 4th, April 17th (Tuesday) and May 2nd.

Transmission Section.—Wednesdays.

October 18*th.*—Mr. H. W. Grimmitt's inaugural address as chairman.

November 8*th.* — Paper: "Cable Terminations," by Mr. D. B. Irving, B.Sc.

December 13*th.*—Paper: "Valuation and Capitalisation of Transformer Losses," by Mr. W. Szwander.

Later dates are February 14th, March 14th, April 11th and May 9th.

Colour Bar

A Complicated Naval Occasion

By N. G. Strong (Lieut. R.N.V.R.)

SHE was an American-built warship, English manned. As our motor boat came alongside and I looked up at her towering sides, I couldn't think what was wrong. It was when I was climbing up the pressed-steel ladder over her side that I suddenly realised. No rivets. All her plates were flush, and welded. So were her decks when I stepped on them. They sprang and clanged underfoot. The Engineer Officer, a two-and-a-half-ringer, R.N.V.R., was waiting for me :

" Good afternoon. You come about the degawsing ? "

" Yes, sir. I expect we'll soon have you right."

" H'm. She's American built, you know. Been on one before ? "

" Er—well—not exactly, sir. But we've had some lectures."

" H'm. Well I'll hand you over to our E.M." (electrical mechanic.)

I felt unconcerned. Not because of the lectures, but because I was accompanied by my Chief Petty Officer, an experienced T.G.I. What he didn't know about electricity in ships—well, I certainly didn't. He would stand no nonsense from a few Yankee volts.

The E.M. was English all right, but he'd been standing by the ship when she was building, and had become slightly Americanised. For one thing he was dressed in a two-piece boiler suit, in green-khaki linen. He tried to explain the trouble, which seemed obscure. It wasn't until he started talking about " the outside mains " that I realised it was a three-wire DC system. It seemed that when he switched on No. 1 coil in reverse, No. 2 ammeter showed 30 amps and the compass turned with the ship's head.

" Ah, some sort of earth, I expect," I said airily. " We'd better ' Megger ' it first. Where's the control panel ? In some dark and steamy corner of the engine room, I suppose ? "

" No, sir," the E.M. looked reproachful, " we got a Dee-Gawzing Room."

A D.G. *room !* These Yanks had the right idea after all. He led the way through the wheelhouse, into the chartroom, and pointed to a large control panel covering the after end of it.

" That's one wall of it, as you might say, sir. The rest of it's through here." He went out of a door, down an alleyway, and in through another door. " That's the back o' the panel," he said simply.

I gazed at what looked like a stage lighting switchboard. It seemed rather an elaborate arrangement for switching on juice. I asked him to fetch the Chief, who was still in the chartroom with the " Megger." He knelt down at the panel, slipped out a large bolt, and shouted to the Chief through the resulting hole. The Chief brought the " Megger," the E.M. connected up the leads, and handed me two ends. I touched one on the framework, and one on a sort of busbar thing.

" All right," I said, " grind away." He ground.

" Ground," he said briefly.

" What reading ? " I asked impatiently.

" Ground—er—that is—earth, sir."

Have to try a process of elimination, I thought. Start with the compensating coils, it's often those. But after gazing helplessly at the complicated wiring for a minute or two I asked the E.M. to fetch the drawings.

" The *drawing*, sir," he amended, and disappeared, to return in a few minutes with a rolled up blue-print. He suggested we took it into the alleyway to look at it. I couldn't think why, till he unrolled it. It was 24 in. wide, and *fourteen feet* long ! I know; I measured it out of curiosity. The complete installation, in every detail, was on the one drawing, together with about 3 ft. of instructions and an axionometric projection of the layout. I got them to hold the ends, whilst I tried to browse up and down, but we blocked the alleyway too much.

" I got them to hold the ends "

So, with the Chief at one end in the chartroom, we fed it through into the wheelhouse. I left the E.M. there, and went back to the D.G. room. After a bit I found two leads which looked as if they might feed the compensating coils, I looked in vain for numbered tapes, to identify them off the drawing, but could see only coloured braid.

I knelt down, withdrew the bolt, and shouted to the Chief: "What part are you at?" He walked up and down the drawing a few paces.

"Seems to be about gas, sir. Calor codes, it says, whatever that means." I remembered something from the lectures.

"Not Calor, Chief. 'Kollor.' It's American for colour." I heard him snort. I referred to my pair of leads again. "Well, Chief, see if you can find—er—orange and black. And ask the E.M. what part he's got." I heard him shouting, then a telephone rang beside me. I took it off its hook on the bulkhead.

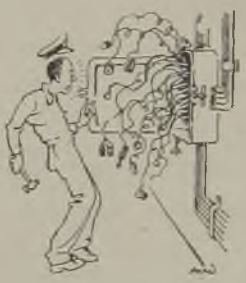
"E.M. here, sir," said a voice. "I'm in the wheelhouse. I've got the part with the compensating coil circuit, and another colour code. There's no orange and black, but there's yellow. Would it be that?"

Well it might have been, in that dim light, and the black may have been splashes of varnish, so I told him to make his end of the drawing fast and bring a torch. A few minutes later a dazzling white beam filled the D.G. room. "Wh-what?" I stuttered, shading my eyes and looking round. The E.M. was carrying a sort of portable searchlight, about the size of a bucket. "It's what they issue us with over there," he said, a little apologetically. Just then I found my own torch, and switched it on for comparison. It seemed to cast a shadow.

Well, the orange certainly looked yellow now, so I told him to disconnect the pair. But he pointed out that they were soldered, following American practice, and it was a solid circuit right through. All the joints were sweated, and there were no fuses. I thought the trouble was most likely in the compensating coils themselves, and that we might as well unsweat the other ends of the leads, so we went to have a look. The ones in the wheelhouse seemed all right—nice and watertight—and we clambered up a pressed-steel ladder on to the upper bridge. Here they are exposed to the weather, and the damp and salt sometimes get in, even in American ones. We followed the leads up through the deck, till they separated into three resistance boxes. Then they joined again and fed into a junction box at the foot of the binnacle, before separating again to the various coils. The junction box seemed the best place to test from, so the three of us got to work chipping the thick paint off the joint and undoing the screws. Then the Chief gave it a judicious blow with a hammer, and the lid fell off.

It was like disembowelling a cat. A mass of brightly coloured entrails disgorged eagerly into my hands. There were braids of every conceivable colour and mixture of colours. Blue and red, gold and red, green and blue, green and red, white, black, maroon, everything. Yards of wire came cascading out, like a conjuror producing paper streamers. In the centre was bolted an ebonite spreader, in two halves, carrying in a row of grooves a number of tinned brass strips, to which the ends of the leads were soldered. It was difficult to get at, however, so probing inside I undid the two screws which held the spreader to the back of the box. Unfortunately they were the same two screws which, with American efficiency, held the halves of the spreader together. It was just like undoing a fat man's belt. Everything sagged happily outwards, and drooped on to the deck in a hopeless jumble.

However, our yellow lead was still there, so we were on the right track. But we still couldn't see which coil it fed, so I sent the Chief and the E.M. below to carry up the drawing. Meanwhile, casting caution to the winds, I decided to open the terminal boxes on the coils themselves. I was just ready for the *coup de grace* when the Chief came clambering up the pressed-steel ladder, towing one end of the drawing.



"It was like disembowelling a cat"

"The E.M.'s on the other end, sir, in the wheelhouse," he puffed.

"Tell him to leave it and stand by up here. I'm going to knock the lid off the terminal box on this coil."

He looked at me mutinously for a full minute, but in the end discipline told. He turned away and called to the E.M. in a strangled sort of voice.

We gathered round the box, I with a raised hammer, but otherwise in the attitude of a wicket keeper. I put the Chief at long-stop and the E.M. in the slips. "Play!" I said, and struck. The lid came away, but nothing else happened. We waited a minute and then went forward to investigate. There was a large ebonite spreader, holding three dear little soldering strips. Three leads came into the box: three leads went out again to the coil. One was yellow. "Hail, Columbia!" I said, and snipped it off. We meggered it. Zero. With a wave of intuition I snipped about an inch off the yellow wire, hooked it on to the "Megger" lead, clear in the air, and tried again. Zero. We looked at the "Megger" leads, which were a bit tangled. I was holding two ends of one. The ends of the other went into the instrument, one each side. The Chief said something about kissing his hand through a ring main, and stood looking up at the mainmast.

But even when we tested it properly,

the coil was still earthed. I knew there were two windings in the coil; and there were three leads, so one was probably common. Was it the yellow one, I wondered. The other two were not coloured at all, the braid having been stripped back to the gland. A real good go at the drawing seemed our only hope. I briefed the other two. The Chief would remain on the bridge, as Captain of the Colour Codes. The E.M. would be in the wheelhouse, standing by the compensating coil wiring end of the drawing. I gave them " Action Stations," and waited. The E.M. went below; the Chief knelt on the deck, crawling along the drawing and peering. He was muttering, " All on the black."

No word came from the E.M., so I bawled over the side of the bridge to him. A quiet voice somewhere behind me said: " E.M. here, sir. You don't have to call, sir. There is communication." I looked round. The voice was coming out of a loudspeaker thing behind me. It went on: " If you wish to speak, there is a hand microphone just by the loudspeaker. Press the switch down first." I found it and pressed the switch. " This is the D.G. Officer——" I said, and stopped. A greater voice than mine had interrupted, booming out over the water, its echoes flung back by the distant hills. " This is the D.G. Officer——" it said, and stopped.

The E.M.'s face appeared at the top of the pressed-steel ladder, looking rather red. " Switch *down*, sir. Not up. That's for the loud-hailer on the mast." The face disappeared. Suddenly the Chief's muttering grew more excited. He had crawled to the side of the bridge, one finger still tracing along the drawing. He started to climb down the ladder slowly, hanging on with one hand, his eyes glued to the drawing. At each rung his foot made a large hole in the drawing.

" Did you say yellow, sir? " he shouted. " I've got it. It says QG1MS." " QG1MS? " asked the loudspeaker. " I've found that here, sir. It says—er—it says—er——" " What? " I asked the microphone testily. " SPARE " boomed the loud-hailer overhead; and the Chief fell off the ladder, half-lapped with blueprint. " Did you say the Yanks was on our side, sir? " he asked plaintively.

In the end I decided to unship the coil and open it up. It was in a metal case, in two halves, and thickly painted. I couldn't quite see how it came apart, so we thought we would let the workshop do it. We took it ashore, and duly handed it over to an L.T.O. I looked in a few hours later. The coil was lying on the bench in two halves. Inside was a tortured mass of copper and charred insulation.

" Ah! " I said to the L.T.O. " So I was right. It was burnt out? "

" Can't rightly say, sir. The two 'alves was sweated together. We 'ad to open it up with a blowlamp."

So now I shall never know where that earth was.

I.E.E. London Students

Programme for 1944-45 Session

A VARIED and interesting programme of meetings, visits and social events has been arranged by the London Students' Section of the Institution of Electrical Engineers for the first half of the 1944–45 session.

In a letter to members the secretary, Mr. R. G. Stefanelli, refers to the dearth of papers available. Perhaps a suitable stimulus to members' ideas in this direction will be provided by the opening meeting on October 16th, when a distinguished " Brains Trust " will answer questions. The panel, with Mr. C. C. Barnes, the Section chairman, as " question master," comprises the following :—Col. Sir A. Stanley Angwin, engineer-in-chief, General Post Office ; Sir Noel Ashbridge, deputy director-general, British Broadcasting Corporation ; Sir John Kennedy, deputy chairman, Electricity Commission ; Dr. C. C. Paterson, director of research laboratories, General Electric Co., Ltd. ; Mr. A. G. Ramsey, chief engineer and assistant director of works, Ministry of Works ; and Mr. J. W. J. Townley, engineer and manager, West Ham Corporation Electricity Department. Questions must be submitted before October 9th.

On Tuesday, November 7th, Mr. Barnes is to give his inaugural address and will take as his subject " Notes on the Design and Manufacture of Impregnated Paper Insulated Power Cables." At the next meeting, on November 27th, Mr. W. A. Hatch will give a lecture, illustrated by slides and films, on " Some Hydro-electric Possibilities and Achievements." On December 20th, a paper is to be presented by Mr. J. F. Stirling on " The Condensation of Atmospheric Moisture on Insulation Surfaces." All the meetings, as last season, will commence at 7 p.m., light refreshments being served at 6.30 p.m.

The first of the visits (Enfield Cable Works, Ltd.) is arranged for Wednesday, October 18th, at 2.30 p.m., and will be followed on October 22nd (2.30 p.m.), by a visit to the works of Hoover, Ltd. Other visits are as follows : November 4th, 2.30 p.m., Union Cold Storage Co., Ltd. ; November 15th, 9.30 p.m., Associated Newspapers, Ltd. ; December 2nd, 2.30 p.m., Young Accumulator Co., Ltd. ; and December 14th, 9.30 p.m., Associated Newspapers, Ltd.

The next social event is fixed for Sunday, October 8th, and will be in the form of a ramble over the Chilterns. An informal dance has been arranged for Saturday, December 9th, at the Lysbeth Hall, Soho Square. (Tickets, which will not be available at the door, are 6s. 6d. single and 12s. double, inclusive of refreshments.)

Institution Centres—II

Chairmen for the 1944-45 Session

A Yorkshireman, **Colonel H. Carter**, T.D., is to be chairman of the I.E.E. Scottish Centre for the forthcoming session. Col. Carter, who has been deputy regional director, Scottish Region, G.P.O., since 1939, was born at Sowerby and received his education at Heath Grammar School and the Municipal Technical School, Halifax, the Royal College of Science, London, and the City and Guilds College. He entered the service of the G.P.O. in 1911 as assistant engineer in the Engineer-in-Chief's Office where in 1928 he became executive engineer. In 1933 he was appointed assistant superintending engineer, S.E. District; in 1936 staff engineer in the Engineer-in-Chief's Office; in 1937 superintending engineer, South Wales District; and in 1939 he became chief regional engineer, Scottish Region.

Col. H. Carter

Col. Carter has represented the G.P.O. on international committees on telephones, and power interference and electrolysis. He served with the R.E. (Signals) from 1914 to 1919. From 1929 to 1933 he commanded the London Anti-aircraft Signals and since 1940 he has been commander of the Post Office Home Guard, Scottish Region.

The Irish Centre chairman, **Mr. P. G. Murphy**, B.Sc., M.E., has been re-elected for a second year of office. Mr. Murphy, who is chief design engineer of the Electricity Supply Board, was born in Dublin and educated at the Royal College of Science and at University College, Dublin, obtaining the B.E. degree in 1922 with first place and first-class honours. After three years as assistant engineer with J. F. Crowley & Partners, consulting engineers, London, he went to Berlin in 1925 as assistant engineer with Siemens-Schuckertwerke, returning to Dublin in 1927 to join the Electricity Supply Board. Mr. Murphy is also a member of the Institution of Mechanical Engineers.

Mr. P. G. Murphy

Mr. J. A. Harle, M.Sc., head of the technical and research department of A. Reyrolle & Co., Ltd., becomes chairman of the North-Eastern Centre. A Newcastle man, he was educated at the Royal Grammar School and Armstrong College (now King's), and served his apprenticeship at the Heaton works of C. A. Parsons & Co., Ltd. He obtained the B.Sc. degree of Durham University with distinction in 1919 and two years later the M.Sc. by thesis. From 1919 to 1922 he held the position of lecturer in electrical engineering at Armstrong College and then entered the employment of Reyrolle & Co. with whom he has remained ever since. Throughout he has served in the technical and research department, first as assistant, then (1927) as deputy head and since 1937 as head.

Mr. J. A. Harle

Mr. Harle was the joint author with the late Prof. W. M. Thornton of a paper on "The Electrolytic Corrosion of Ferrous Metals" presented to the Faraday Society in 1922, and during last session, jointly with Mr. R. W. Wild, he submitted a paper to the I.E.E. on "Restriking Voltage as a Factor in the Performance, Rating and Selection of Circuit-Breakers" which has been awarded the Ayrton Premium by the Council of the Institution. He was a member of Committees 17 and 8 of the International Electrotechnical Commission, 1938.

Mr. William Kidd, who has been elected chairman of the North-Western Centre, is chief constructional engineer to the Manchester Corporation Electricity Department. He was born at Newcastle-on-Tyne and received his technical training at Rutherford College and the Durham College of Science. After holding positions with the Great Eastern Railway, the Yorkshire Brass & Copper Co., the Palmer Shipbuilding Company and the North Eastern Marine Engineering Co., Mr. Kidd joined the Manchester Electricity Department as a draughtsman and personal assistant to the deputy chief engineer. He was appointed assistant engineer at the Stuart Street station in 1917, constructional engineer at the Barton station and for the 33-kV system in 1921 and took up his present position of chief constructional engineer in 1925.

Mr. W. Kidd

Mr. Kidd won the I.E.E. Institution Premium in 1934. He is a member of the Institution of Mechanical Engineers and of the E.R.A. Transformer Committee, and is the author of several papers and articles on switchgear, voltage control, supervisory gear, substation design and fire protection, being the joint inventor of a supervisory system.

Compact Discharge Lamp

Designed for Specialised Applications

By H. E. Grafton Watts, A.M.I.Mech.E.
(Lighting Section, B.T.H. Co., Ltd.)

FOR the needs of many research and experimental workers, and the higher class of precision production testing, a special discharge lamp developed in recent years is the 250-W type ME/D, which serves as a compact light source for profile projectors, projection microscopes, lantern slide projection and the examination of glass.

The essential part of the lamp is a comparatively small quartz bulb which in the two standard production types is either contained in a metal box housing, 130 mm. by 55 mm. by 64 mm. or in a glass envelope 51 mm. diam. by 130 mm. long. Both have the same light centre length of 80 mm. (measured from the base) and, since both are fitted with a standard 3-pin 5-A plug base to B.S.S. 546/1934, the lamps are interchangeable.

The choice between the two types is governed largely by the fact that the box lamp does not require housing and is normally fitted with a 46 mm. diameter window on one side; whereas the glass envelope model should be used with a lamp housing. The direction and candle-power of the light distribution of the two types are shown in Fig. 1, from which a choice can be made in order to apply the most suitable to the particular apparatus.

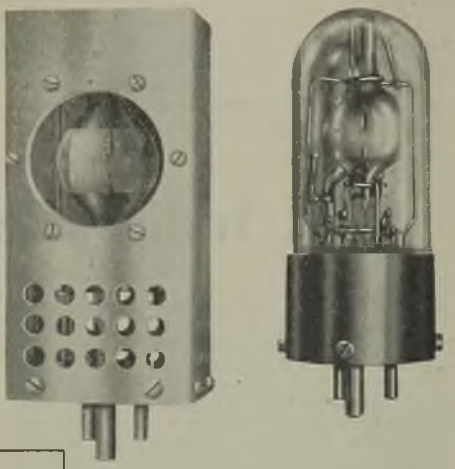


Fig. 2, Small source box lamp (left) and glass envelope type (right) without housing

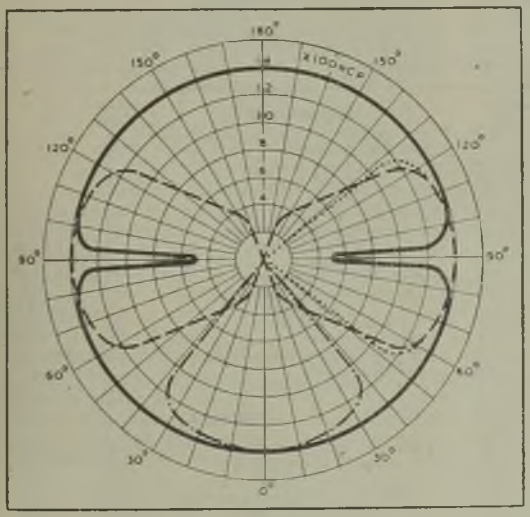


Fig. 1.—Superimposed polar curves of both types of lamps

——— Distribution in horizontal plane through centre of glass lamp.
— — — Distribution in vertical plane 0—180 deg. through axis of glass lamp.
— · — · Distribution in horizontal plane through centre of box lamp.
. . . . . Distribution in vertical plane 0—180 deg. through axis of box lamp.

Both types (Fig. 2) possess three inherent qualities which enable them to replace the carbon arc and other small source high power illuminants. First, the lamp burns very steadily and is thus suitable for prolonged observation, or for photographic work on optical instruments. In the second place this type has a long life with very little change of output and requires no attention. Thirdly, the radiation from the M.E. type of lamp combines high actinic value with comparative coolness in operation.

The chief characteristics of the two lamps are:— Arc length, 3·75 mm.; effective arc width, 1·5 mm. approx.; voltage of supply, 200/250 V; lamp voltage, 60-75 V; lamp current, 3·7-4·6 A; starting current, 5 A approx.; initial max. brightness,

18,000 stilb.; quoted average life, 500 hours.

The M.E. 250-W lamp is intended primarily for operation on alternating current (200/250 V supply) when a BTH type MRA 246 choke is used, power factor correction being obtained by a 60 μF condenser. However, equipment has been developed for the operation of this lamp on DC, which is achieved by introducing a suitable resistance into the circuit, retaining the choke in order to provide an inductive kick to facilitate starting.

The great brightness of the small light source has the inherent advantage in optical instruments that, being of a small size, it is easily controlled by simple optical arrangement. Comparative brightnesses of various sources are shown in the table, from which it will be appreciated that this lamp compares very favourably with the low-intensity carbon arc.

BRIGHTNESS DATA OF VARIOUS LIGHT SOURCES FOR PROJECTION

Type of Lamp	Approx. Brightness, Candles per sq. cm.
General service tungsten filament lamp	500–1,000
Tungsten filament projector lamp	1,000–3,000
"Pointolite"	1,000–3,000
Low intensity carbon arc	10,000–25,000
High intensity carbon arc	30,000–100,000
Electric Discharge Lamps	
Size of Source	
Type M.A. 400W 160 × 7 mm.	150
Type M.B. 125W 30 × 2 mm.	800
Type M.E. Box 250W 3·75 × 1·5 mm.	18,000
Type M.D./H. 1,000W 25 × 0·9 mm.	30,000

West Indies Electrical Imports

Reduced Trade in 1942

THE electrical import trade of Trinidad in 1942 showed a decline on the whole compared with 1941. There were a few increases, *e.g.*, insulated wires and cables, batteries and lighting goods, but these were more than offset by decreases in machinery, refrigerators and unspecified apparatus and appliances. Electrical imports into Jamaica suffered a setback, which ran through all groups and was particularly noteworthy in generating plant.

In the following tables the figures for 1942 are shown, with the increase or decrease on 1941.

Many plans for post-war development of Jamaica and Trinidad and the West Indies generally have been under discussion in recent months. Greater diversity and more modern methods are advocated for agriculture, and unification of currencies and Customs tariffs is another recommendation.

According to the report of the West Indian Conference held in Barbados, public works are recommended immediately for the relief of unemployment, these to include power projects.

Class of Goods	1942 $(000)	Inc. or dec.
TRINIDAD		
Insulated wires and cables	298	+ 85
From United Kingdom	133	+ 10
„ United States	101	+ 57
„ Canada	64	+ 18
Primary batteries	58	+ 30
From United Kingdom	10	+ 6
„ United States	44	+ 42
„ Canada	4	— 18
*Electric stoves**	9	— 24
Other electric cooking and heating appliances	12	+ 1
From United States	9	+ 8
„ Canada	3	— 3
Electric refrigerators	24	— 56
From United States	5	— 2
„ Canada	19	— 52
Goods and apparatus, n.o.p.	314	— 27
From United Kingdom	80	— 21
„ United States	184	+ 17
„ Canada	49	— 22
Electrical machinery	629	— 59
From United Kingdom	341	+ 186
„ United States	276	— 217
„ Canada	11	— 27
Radio apparatus	115	— 1
From United Kingdom	60	— 9
„ United States	44	+ 20
„ Canada	11	— 12
Other telegraph and telephone apparatus	83	+ 2
From United Kingdom	71	— 1
„ United States	9	+ 1

* Mainly from U.K.

Class of Goods	1942 $(000)	Inc. or dec.
Lamps under 20 V	12	— 3
From United Kingdom	4	—
„ United States	2	— 3
„ Canada	5	— 1
Lamps over 20 V	60	+ 16
From United Kingdom	47	+ 11
„ United States	7	+ 6
„ Canada	6	— 1
Other lighting appliances	44	+ 9
From United Kingdom	15	+ 1
„ United States	19	+ 12
Accumulators and parts	30	— 8
From Canada	26	— 10
Electrical appliances, n.o.p.	5	— 2
From Canada	2	—
„ United States	2	— 1
JAMAICA		
	£	
Radio sets and parts	10,100	— 4,700
From United Kingdom	6,500	— 2,000
„ United States	3,500	+ 700
Telegraph and telephone apparatus	19,800	— 11,800
From United Kingdom	18,700	— 6,800
„ United States	800	— 1,100
Other electrical apparatus	23,800	— 28,900
From United Kingdom	3,900	— 3,700
„ Canada	6,900	— 19,700
„ United States	12,900	— 5,200
X-ray apparatus and films	290	— 860
Generating machinery	16,000	— 48,000
From United Kingdom	800	— 2,300
„ Canada	4,200	— 22,900
„ United States	11,000	— 22,900

CORRESPONDENCE

Letters should bear the writers' names and addresses, not necessarily for publication. Responsibility cannot be accepted for correspondents' opinions.

Slide Rules

WITH regard to Mr. W. M. Gore's interesting article on a special slide rule for deriving power factor from kW and kVAr in your June 9th issue, I would point out that with an ordinary rule one need not resort to tables after finding cos ϕ, for in a triangle, given $c^2 = a^2 + b^2$ if we divide across by a^2 then $\frac{c^2}{a^2} = 1 + \frac{b^2}{a^2}$ or $\sec^2 \phi = 1 + \tan^2 \phi$, the angle ϕ being opposite side b, so if we were given, say, 4 kW and 3 kVAr we could (1) find tan ϕ on scale D as usual = 0·75, but ignore it and read $\tan^2 \phi$ on scale A instead, = 0·5625 ; (2) now set index of B to 1 — $\tan^2 \phi$, or $\sec^2 \phi$, = 1·5625 on A. Below on scale D is sec ϕ, which is not wanted, but its reciprocal cos ϕ is on scale C opposite D index = 0·8. Also opposite 4 kW on C we find the kVA = 5 on D scale. Thus one additional setting yields the two results required.

New Westminster, B.C., S. ALFRED YOUNG.
Canada.

Load Limitation

RECENTLY, attention has been focused on the wastage of capital owing to the construction of dwellings so that coal, electricity and gas can be used for water heating and cooking. It is accepted in business that low terms may be quoted for exclusive custom, and the electricity supply industry should therefore state its views, well in advance.

The coal-fired range and the extensive plumbing for the coal-heated hot-water system is quite out of date. On account of health and convenience, the value of electricity for cooking and water heating exceeds that of gas, but I doubt whether the uninformed will appreciate the saving of space and cost of flues due to electricity.

At the lowest end of the scale of purchasing power the use of electricity alone for space heating may be too expensive, though the elimination of flues will substantially assist in its adoption by those with incomes exceeding the average. On constructional and economical grounds, electricity is eminently suitable for heating large blocks of flats let at low rentals.

In the past the difference between consumers' installations and between the habits of individual users has given a factor that has been applied to the reduction of capital charges paid by consumers. Broadcasting and other communal influences tend to synchronise the habits of the people, and as we approach saturation diversity factors cannot be expected to remain as at present. The charging of the very low prices called for by certain types of load may necessitate some restriction on consumers' demands for supplies given under the existing statutory limitations of voltage variation. In any case, knowledge of possible network peak loading will assist in permitting more economical distribution system design than is at present practicable.

Load control either centrally or locally will, I feel sure, become essential to economic distribution in residential areas. With thermostatic control of heating appliances, the restoration of supply to a district after interruption due to abnormal demand is made doubly difficult.

The coincidence of cooker demands is experienced by many undertakings at present; a low diversity factor is apparently to be expected with this class of load. I doubt, however, whether it is reasonable to continue to cater for the possible superimposition of electric cooker and radiator demands. The usefulness of the electric radiator is appreciated by all classes of consumers and it would be wrong to penalise its general use by the imposition of a high tariff, as the peaks would still occur though they would be of shorter duration.

If it could be agreed that it would be reasonable to limit the demand of the cheap-rate consumer in strict accordance with the variety of uses to which he puts electrical energy, then a limit slightly in excess of the cooker full load might be set for the installation using electricity for lighting, water heating and cooking. A limit of 30 A at 230 V would rarely impose any inconvenience on the user, and would allow full use of the cooker, radio set, lighting and electric kettle. An electric cooker hardly ever requires its rated load and in practice a substantial proportion of electric-radiator and miscellaneous device requirements would be constantly available.

A load-limiting scheme can be applied with little difficulty to water heaters of suitably large capacity, with thermostatic control, if the cooker control unit is fitted with a change-over switch having two positions "cooker on" and "water heater on." The electric wash boiler could be connected in parallel with the water heater. The location of the water heater is important in order to avoid pipe losses and to secure instant availability of hot water.

If the cooker is installed and regularly maintained by the supply authority, a circuit-breaker could be included in the cooker-

control unit for the purpose of interrupting the supply to portable devices in other rooms, when the total demand exceeded the prescribed maximum. Where other conditions apply, a circuit-breaker for operation on maximum current should be mounted at the termination of the undertaking's service cable.

If the demand for water heating and cooking is limited to, say, 6·9 kW, then it would not be fair to allow a consumer using electricity for small devices only to impose a radiator demand on top of the system cooking peak, when charged on the same tariff.

Although these considerations principally affect the low wage earner, many of them apply equally to the more prosperous rural consumer. I believe the general convenience of electricity in the domestic field to be so fully appreciated that some slight restriction would be preferred to going without.

Bristol. G. H. BOWDEN, A.M.I.E.E.

Electricity *v.* Solid Fuel for Grain Drying

HAVING read the articles by Mr. Wild of Bedford and Mr. Cameron Brown together with the report of the Norwich conference and demonstration in recent issues of the *Electrical Review*, I would like to press still further the ideal method of grain drying, *i.e.*, electrically.

I consider it time that the manufacturers of grain drying plant accepted the inevitable and incorporated in their product the electrical equipment required to dry grain instead of shelving it and only putting forward the solid fuel method. Whilst the solid fuel method is the cheaper in capital cost, does it produce satisfactorily what the farmer finally requires—dry grain, not burned? Are the manufacturers convinced that they are selling the farmer the best article, which after all is the soundest method of a sales organisation? Even in grain dryers that are made by well-known electrical manufacturers the coke drying principle is put forward and they do not appear to be interested in the electrical method, even when asked by the farmer.

At the present time it is the supply authority which has to force the pace with either the farmer or his supply agents and convince him or them that the electrical method is the ideal way, and against something put forward by the manufacturers. Then the supply authority has to become an expert in one more sphere—grain drying and all its peculiarities.

I am well aware that the E.R.A. is doing good work on this subject and that we have a keen and live authority on electricity in agriculture in Mr. Cameron Brown, but is the electrical industry sufficiently forceful to make electricity the only agent for grain drying, which to my mind it should be? It has all the advantages, efficiency, perfect control (completely automatic by thermostatic means), labour saving, a sound finished article, and above all a satisfied farmer and consumer who knows that his finished article is uniformly dried at a constant temperature and not burned or insufficiently dried.

I note that Mr. Cameron Brown says that he will be pleased to make personal contact with persons constructively critical. We in St. Helens would be pleased to see him or anyone else interested and show him a dryer in our area which has been converted to electrical operation. This dryer is entirely new and was manufactured by a well-known company. The electrical conversion was carried out under the direction of Mr. P. Bregazzi, A.M.I.E.E., the borough electrical engineer.

St. Helens. T. S. PARKINSON, A.M.I.E.E., *Deputy Borough Electrical Engineer.*

Cheapening Electricity

THE letter by Mr. A. M. Harker in your issue of September 8th sets out to prove that electricity for domestic purposes, which includes space heating, cannot be supplied on a two-part tariff with a running charge of ½d. per kWh. The suggestion is made that the running charge should be increased to 1d. per kWh with a rebate to those consumers who use electricity for cooking, water heating, refrigeration and any other load which it is desirable to encourage.

When Mr. Harker has encouraged a good cooking load and finds that his peak occurs every day at midday, would he then give a rebate to consumers using electric cookers?

Why not tackle the problem of reducing costs? In the year 1939–40 just over £20,000,000 was paid as interest out of the total revenue of all authorised undertakings of £103,000,000. By pooling resources the supply industry ought gradually to reduce this item of expenditure until it was finally removed from the balance sheet.

Referring to other correspondence in the same issue on control systems, I would suggest that all of these systems have their uses but none should be used to restrict supplies. Let us find where each can best be used in the service of the consumer and get on with the job of selling more units.

Welwyn Garden City. B. CROWSLEY.

Proposed Ulster Electricity Authority

CREATION of a Northern Ireland electricity authority with power to direct the operation of all generating stations in the Province as to quantity and rate of output is recommended in the report of a joint committee of representatives from the Ministry of Commerce and Belfast Corporation.

The authority, it is suggested, should assume duties corresponding to those of the Central Board in Britain, purchasing all electricity produced and selling it in bulk to undertakings at equitable tariffs. It would have power to acquire by compulsion or agreement any station not operated according to requirements.

PERSONAL and SOCIAL

News of Men and Women of the Industry

THE Distinguished Flying Cross has been awarded to **Pilot-Officer Geoffrey Victor Malon,** R.A.F.V.R., No. 207 Squadron, on the staff of the General Electric Co., Ltd., Hull, "in recognition of gallantry and devotion to duty in the execution of air operations."

At a recent meeting of the Carlisle City Council an illuminated address recording the Council's appreciation of his "efficient and valuable services" was presented to **Mr. C. W. Salt,** who this week retires from the position of city electrical engineer and manager. Mr. Salt is leaving Carlisle to take up residence in London and Mr. J. R. Potts, chairman of the Electricity Committee, wished him long life and happiness in his new home. After members of the Council had added their tributes the Mayor made the presentation and Mr. Salt, in replying, said that his twenty-five years' service at Carlisle had been one of the happiest periods of his career.

Mr. A. J. Ryan, borough electrical engineer of Hastings, who was to have retired on superannuation after thirty-one years' service with the Corporation, is remaining in office in a temporary capacity for another year.

The holding of the I.M.E.A. annual meeting at Manchester on September 14th enabled a number of chief engineers and in some cases their committee chairmen to take advantage of an invitation to visit the factory of Ferguson, Pailin, Ltd. At a luncheon at the Queen's Hotel preceding the visit Mr. J. R. Wilkinson welcomed the guests and Mr. Kenyon replied. At the works various types of switchgear were seen in course of construction, including some of the latest air-blast designs.

An interesting "get-together" programme with the joint purpose of raising further funds for one of H.M. submarines which has been adopted by the Stafford works of the English Electric Co., Ltd., and providing entertainment, was held on September 9th. After a cricket match in which the Club XI (223 for 9, declared) beat the President's XV (all out for 36) there was a social evening with a cabaret and dance. Addressing the visitors, **Mr. J. W. C. Milligan** (president of the English Electric Cricket Club and manager of the company's Stafford works) gave a brief history of the Club's activities during the war and mentioned that a substantial sum had been raised for charitable purposes.

Mr. H. H. Saunders, general manager of the Lowestoft electricity and transport undertakings, who was due to retire, is to continue in the Corporation's service until June next, after which he will be engaged in a consultative capacity with an honorarium of £100 a year. From July next **Mr. G. W. Steward,** borough electrical engineer, is to be general manager and electrical engineer of the undertakings, at a salary of £850 per annum, and **Mr. G. M. Payne** will become deputy chief engineer.

The new session of the Institution of Mechanical Engineers commences on Friday, October 20th, with the presidential address of **Dr. H. R. Ricardo,** whose subject is "Applied Research."

Mr. C. C. Baker has resigned from the board of the Kalgoorlie Electric Tramways, Ltd., owing to ill-health, and **Col. William Parker** has been elected a director.

Mr. N. J. Wiseman has been recommended for the position of assistant installation engineer in the Hackney Borough Council Electricity Department. He has been in the service of the Council for twenty-six years and since 1940 has been seconded to the London County Council at Hackney Technical Institute, instructing members of the Forces in wiring installation work. Before that he served as installation inspector on special work.

Municipal engineers and committee chairmen at the Ferguson Pailin works

Mr. F. A. Hill, A.M.I.E.E., a principal assistant in the L.C.C. chief engineer's department is retiring on September 30th. In reporting the retirement the Establishment Committee says that Mr. Hill entered the Council's service in 1902 and reached his present grade in 1939. "He has shown exceptional ability and thoroughness in the performance of the many

and various duties entrusted to him, which included electricity meter testing, installation and maintenance of electrical equipment at educational establishments and housing estates."

For his paper on "Tidal Power" presented to the Junior Institution of Engineers during the 1943-44 session, **Mr. R. H. Abell** receives the Institution premier award. The Tookey award goes to **Mr. A. C. F. Mackadam** for his paper on "Industrial Infra-Red Heating," and the North-Western Section prize to **Mr. H. H. Daniels** for "Some Notes on the Design of Switchgear Operating Mechanisms." **Mr. E. G. Kimsey** receives the Durham bursary for a thesis on "Treatment of Boiler Feed-Water."

Mr. Taylor Croft, a director of Contractors (Pudsey), Ltd., electrical engineers, is to be the next Mayor of Pudsey, near Leeds.

Mr. R. S. Good, divisional engineer (electrical), trams and trolley-buses, who has retired after over forty-years' continuous association with passenger transport, joined the London County Council Tramways in 1903 when electrification of that system in South London began. In 1906 he transferred to North London and was responsible for the installation of the sub-station plant needed for the conversion of the horse-tramways to electricity. In 1933, when the London Passenger Transport Board was established, the area supervised by Mr. Good was more than doubled. One of Mr. Good's war-time responsibilities has been the repair of overhead equipment and cables damaged by enemy action.

Mr. F. J. Hawkins

On page 452 we publish some notes on the centenary of the electrical contracting firm of Alexander Hawkins & Sons, Ltd. **Mr. Frank J. Hawkins,** who is joint managing director, has been a member of the Council and chairman of the London Branch of the Electrical Contractors' Association.

Dr. P. M. Fisk has joined Multicore Solders, Ltd., and its associated companies as chief chemist. Previously he was chief chemist to the Crittall Manufacturing Co., Ltd., and Briggs Motor Bodies, Ltd.

Mr. J. F. C. Morden, B.Sc., has been appointed chief metallurgist to Bound Brook Bearings (G.B.), Ltd.

The Glasgow Corporation is inviting applications, by November 18th, for the position of deputy manager of the Transport Department. The salary offered is £1,000, rising to £1,250, plus war bonus amounting at present to £40.

Appointments Vacant.—Among the appointments advertised in this issue are the following: Assistant operating engineer (£665) and charge engineer (£555) for Fulham; power station superintendent (£611) for St. Helens; assistant head of Department of Electrical Engineering, Birmingham Central Technical College (£450); area officer for the British Electrical Development Association; superintendent of contracting department for a South-East Coast electricity supply undertaking; and engineering lecturer for West Africa (up to £1,000).

"Illumination: Is it Engineering?" was the subject of a talk by **Mr. E. G. Phillips** (incoming chairman), at the annual meeting of the Nottingham Centre (East Midland Area) of the Illuminating Engineering Society, following a luncheon at the Mikado Café, Nottingham.

Obituary

Flight-Lt. J. Parkin.—The death in a recent flying accident is announced of Flight-Lieutenant James Parkin, R.A.F.V.R., son of Captain Alfred Parkin, R.A.O.C. Northern Counties Area Officer of the Electrical Development Association. Before the war "Jimmy" Parkin was on the staff of the Newcastle Branch of the B.T.H. He joined the R.A.F. in 1939 at the age of nineteen. We extend our sympathy to Capt. Parkin.

Mr. A. H. Sears, assistant engineer in the Chief Engineer's Department of the London County Council, whose death occurred on September 18th, was a graduate of Finsbury Technical College and subsequently spent several years with Chamberlain & Hookham, Ltd., Bertram Thomas, Ltd., and the Llandindrod Wells Electric Light Co. In 1903 he joined the staff of the L.C.C. and shared in all the various electrical activities of that body until he retired in 1940. Among the works with which he was particularly associated were the relighting of the Victoria Embankment and the equipment of the County Hall. In 1930 he took charge of all electrical work in the large numbers of hospitals and institutions which had been passed to the control of the Council by the Local Government Act of 1929. Many of these installations were old and insufficient and the renewal of these, the equipment of new buildings and the installation of X-ray and electro-medical departments occupied him and a large number of assistants for the next ten years. He was a member of the Institution of Electrical Engineers and an electrical inspector under the Electricity Supply Acts. He leaves a wife and three sons.

Mrs. A. Parkinson.—We learn with regret of the death on September 22nd of Mrs. May Parkinson, wife of Mr. Albert Parkinson of Crompton Parkinson, Ltd.

Mr. R. J. Stearn.—The death occurred recently at the age of fifty-seven of Mr. Robert John Stearn, who had carried on business at Luton for many years as a registered electrical installation contractor.

Wills.—The late **Mr. Ernest Schattner,** M.I.E.E., founder of the Schattner Electricity Meter Co., Ltd., and a director of the Electrical Apparatus Co., Ltd., and other companies left £26,254 (net personalty £26,018).

The late **Sir William Chamberlain,** Regional Transport Commissioner for the North West, who formerly held the positions of tramways manager at Oldham, Leeds and Belfast, left £16,337 (net personalty £15,513).

The late **Mr. M. H. Goldstone,** chairman and managing director of Ward & Goldstone, Ltd., left £82,090 (net personalty £76,651).

COMMERCE and INDUSTRY

Women and the E.T.U. Reasons for Fife Decision.

War Damage Premiums

THE Board of Trade announces that War Damage policies under the Business Scheme in force on September 30th, will be extended until December 31st, 1944, without further payment of premium or further action on the part of the policy holders. For additional or new insurance under the Business Scheme the premium has been reduced to 1s. 8d. per cent. for the three months October 1st to December 31st, 1944 (minimum 5s.).

Claims for war damage to personal and household goods under the Private Chattels Scheme should ordinarily be made within thirty days of the damage, but it is realised that there may in some cases be difficulty at present in complying strictly with this requirement. If, in such cases, the claim is received within three months of the damage, no separate application for extension of time is necessary. The claimant should, however, state the reason for the delay either on the claim form or in an accompanying letter.

E.T.U. Conference

Reference is made in a leaderette to the resolution calling for the nationalisation of electricity supply passed at last week's conference of the Electrical Trades Union at Blackpool. Another subject discussed was "dilution." Mr. E. W. Bussey, the general secretary, described resolutions relating to the granting of facilities for membership to "dilutees," brought in because of the war, as "the outcome of some manœuvring." Dilution had been accepted for the war and it had been emphasised to employers and the Government that dilutees could not be accepted as permanent members of the industry. The industry's duty was to see that their 25,000 members in the Forces got their jobs back and no dilutees remained while one of their members was unemployed. There was a place for women in the industry but none for "pin money women." The resolutions were defeated.

A resolution urging that every endeavour should be used to further the apprenticeship system and provide full facilities for technical education within working hours, without loss of pay, was carried.

Rural Electrification in the U.S.A.

A report prepared by Dr. F. W. Muller on "Public Rural Electrification" has just been issued by the American Council of Public Affairs (cloth $3, paper $2·50). It is based upon first-hand investigations into the work of the Rural Electrification Administration and is concerned with many matters now the subject of inquiry by the U.S. Senate, although undertaken without reference to the latter.

Primarily concerned with policy and administrative matters, the report presents a detailed analysis of the basic operations of the Administration and its relationship with rural electric co-operatives, which the author believes will probably enter other fields. It is contended that the rural electrification programme has on the whole been successfully carried out, but certain administrative weaknesses are criticised. The author concludes that the programme, by raising rural standards, has benefited the country as a whole and that it may well be extended after the war to cover all rural areas. In view of the strength of political support for the scheme, he regards it as most unlikely that Government aid will be withdrawn.

Crompton Lamp Publicity

The forthcoming lamp season will see Crompton lamps well advertised in a series of national morning and London evening newspapers, Sunday papers, weekly periodicals, and an extensive list of provincial newspapers. The "Hats on Lamps" campaign, which was so successful some years ago, is being revived to feature topical headwear, such as Wren, Land Army and Tank Corps hats, etc. The Crompton poster campaign in shopping centres will be continued, although in not such great strength, and hand-painted signs on railway stations and picked sites on arterial roads will also be in evidence.

New Crompton lamp poster

For Kye lamps an extensive national, weekly, periodical and provincial Press campaign is to be undertaken, the appeal being the economical purchase price. So far as the trade and technical Press advertising is concerned a wide list of journals appealing to industry as well as to lamp stockists will be used.

Fife Kitchens Dispute

It was reported in our issue of August 4th that the Fife County Council had accepted a scheme for the all-electric operation of its Catering Committee's kitchens to the exclusion of gas, except as a stand-by. Protests have been made by the gas interests, the latest being from the National Gas Council (Scottish District) in a memorandum submitted at a meeting of the Dunfermline Town Council by the convener of the Gas Committee. This deprecated "the rather hasty and inspired action which was taken by the County Council with regard to the equipment of those cooking centres, without giving people who were doing so much for Fife in the way of trade and ratepaying a chance to compete."

A member of the Catering Committee, in supporting the Committee's decision said, according to the *Dunfermline Press*, that there

were only three gas works in Fife which could have quoted satisfactorily for the kitchens, the remainder charging prices which were far in excess of these three, and they had had from the Fife Electric Power Company a rate uniform to all the kitchens. Moreover, it was found that it would be almost impossible to install both gas and electric fittings in some kitchens on an economical basis, so that it was a case of adopting either the one system or the other. They could not have both. Besides it had been found impossible to obtain from the pool, gas fittings for the whole of the kitchens.

He admitted that they could have got a cheaper rate for gas for some of the kitchens, but that was not the only question involved. They had twenty-one kitchens situated all over Fife. It was necessary to look for a bulk and uniform supply, and that was why they made the bargain with the Fife Power Company. It was a cheap rate, but the company was taking the long view. If the gas undertakings had come along with a quotation to cover the whole of the kitchens, he thought that gas would have been able to compete, probably successfully, against electricity. It was because electricity was cheaper, in all-in prices, that they accepted the offer by the Power Company.

Housing Manual

Under this title the Ministries of Health and Works have issued an illustrated guide for local authorities, architects and others concerned with the design and equipment of dwellings (Stationery Office, 2s. net.). Much of the matter is based upon the report of the Sub-Committee on the Design of Dwellings which Mr. F. W. Purse comments upon in this issue.. The nine chapters into which the manual is divided cover housing and site planning; the house in its surroundings; the three-bedroom house; some special occupants (rural workers, old people, etc.); flats; efficiency in building; new materials and methods; the heat installation; and services and equipment.

In the last section reference is made to ring main circuits in rooms and the availability of a 3-kW plug and socket. Adequate outlets are advocated, lists being given for three types of houses for which from twelve to fourteen points are prescribed. Both in this chapter and in that on heating the merits and drawbacks of coal, gas and electricity are somwhat cursorily treated. The real value of the manual appears to lie in the parts dealing with lay-out and design. There are many drawings, and forty-eight plates are devoted to photographs of actual blocks of flats and houses.

Farm Pumping Scheme

How a plentiful supply of water has been provided for 800 acres of mixed farm land at Bishops Sutton, near Alresford, Hants, piped to every field and to three farmhouses as well as eleven cottages, is described in the *Farmer and Stock-breeder*. The scheme was devised for the owner-occupiers, Messrs. J. T. and J. H. Mills, by Messrs. Richard Austin and Wyatt, Fareham, and carried out with the aid of a Ministry of Agriculture grant of half the total cost of £4,000, the cost of pumping being 6d. per 2,000 gallons. The contractors were Henry Osman & Co., Ltd., Southampton.

A 10-in. bore hole has been made in the farmyard, 101 ft. deep and lined with steel tube to a depth of 43 ft. Inside it is a submersible pump (Sumo Pumps, Ltd.) driven at 2,900 RPM by a 7-HP motor at its lower end, the whole being suspended from a chain within the bore tube. The actual delivery is 2,084 gall. per hour against a total head of 280 ft. uphill to a 30,000-gall. reservoir a mile away. There are over five miles of piping, laid to every field, 35 concrete drinking troughs for cattle and nine points fitted with hose attachments.

The only portion of the gear visible above ground is a wooden board on which are mounted the switch-fuse box, motor starter, watt-hour meter and pump gauge, situated at the lowest point of the installation where the water pressure is 100 lb. per sq. in., which is more than sufficient for normal farm purposes. Pumping commenced in June, 1944, at 400 V three-phase in substitution for the single-phase power originally available, which would have limited pumping to certain times of the day.

Portable Tool Film

There was a pre-view in London last week of a new 35 mm. 20-minute technical instruction film ("A Train of Thought") illustrating the manufacture of portable electric tools. The story opens with a railway carriage scene depicting men and women on a long journey north. The question of punching holes is is introduced into the conversation of two members of the party; the conversation becomes general, the trend of discussion being their work, and by "coincidence" a member of the technical staff of Black & Decker, Ltd., is making the same journey and offers to explain how portable electric tools are manufactured, particularly the gearing.

To break up the factory production shots at Harmondsworth, there are flashbacks to the railway carriage scene which intersperse production with the outside applications in many industries.

Industrial Health Welfare

To make available to British industry the results of its experience in industrial medical welfare during the last few years the Automatic Telephone & Electric Co., Ltd., Strowger Works, Liverpool, has prepared a 50-page pamphlet which, to meet the requirements of the Control of Paper Order, is priced at 2s. The publication is well illustrated with charts and graphs, and besides emphasising the proved value of introducing health supervision in factories, describes in detail the system of absence recording adopted by the company.

Contracting Firm's Centenary

A hundred years ago this year Alexander Hawkins founded what is now the well-known electrical contracting firm of Alexander Hawkins & Sons, Ltd., of London Road, Southwark. Actually it was the founder's son, Alexander Hawkins, jun., who, visualising the tremendous opportunities arising from the introduction of electricity, was responsible for the establishment of an electrical department in 1899.

From a modest beginning the company can claim to be one of the leading electrical contractors of the country and among the many important contracts which it has undertaken

may be mentioned the original installation at the Old Vic, the temporary Waterloo Bridge, and the London County Hall extension, the last-mentioned contract involving the installation of 86 miles of cable, 33 miles of solid drawn conduit, 8,000 ft. of 3-in. barrel, 3,000 lighting and 350 clock points, 1,100 automatic telephones, power points for passenger and goods lifts, fans, ventilating plant, pumps, etc. Recently the company has devoted a great deal of its attention to L.C.C. and G.P.O. work, wiring many housing estates, institutions, schools and hospitals and some hundreds of new post offices and telephone exchanges.

Particular pride is taken too in permanent maintenance contracts, often extending back over many years, which the company undertakes for important factories and businesses in South-East London. The electrical department is managed by Mr. Edwin Brindley, under the direction of Mr. Frank Hawkins, who has been a member of the Council and chairman of the London Branch of the Electrical Contractors' Association.

Cable Makers' Wages

We are informed by the Joint Industrial Council for the Electric Cable Making Industry that the 3s. service bonus now paid to female time-workers and piece-workers after six months' service shall at the ages of 16 and 17 be paid at the commencement of employment in Districts 1 and 2 during the period of the war. In these districts an increase of 1s. 6d. per week is to be paid to adult female time-workers and piece-workers. These increases are to be added to the cost-of-living bonus and will take effect as from the first pay-day in October.

North-Eastern Industrial Development

Addressing directors of engineering firms, managers and production engineers at Newcastle-on-Tyne, on his plan for the setting up of a central organisation in the North-East to help the development of the light engineering industry, Mr. R. W. Mann, managing director of Victor Products, Ltd., Wallsend, said his plan would ultimately mean more employment in the area, which was what was needed. Mr. Mann, who was speaking at the invitation of the Ministry of Supply, said that the proposed central organisation would deal with methods of production. He suggested that it would result in larger profits which would enable small firms to extend their businesses. Mr. Mann's plan, which involves financial support from engineering concerns in the area, is being considered by the undertakings concerned. Col. H. B. Leeson, managing director of A. Reyrolle & Co., Ltd., presided at the meeting.

Broken Earth Wire

Following the death last July of an employee, Herbert Samuel Hole, while engaged in drilling, the Tiverton Motor Company, Lowman Green, was on September 14th fined £25 at Tiverton Borough Sessions for neglecting to observe a regulation under the Factory and Workshops Act in that a metal drill was not efficiently earthed.

For the prosecution it was stated that in the drill case was found a piece of metal turning which apparently caused a "short." Had the earth wire of an extension cable not been broken there would have been no ill result. The break in the earth wire was considered to be due to the handling the drill received and the continual twisting of the cable. The earthing installation in the premises was efficient. In reply to questions Mr. H. G. Frampton, electrical inspector of factories, said that simple electrical tests would have shown a break. Weekly or monthly tests might suffice, but where working conditions were very hard a daily test might be necessary.

For the defence it was claimed that there was no evidence that the cable was fractured before the accident, and that the whole cause was the piece of foreign metal which entered the switch-box. The drill was overhauled by the makers only a week before. It was admitted, in reply to a question, that the extension cable was not tested after the drill had been overhauled; the drill only came back during the week.

Philips' Eindhoven Works

The Philips electrical component factory at Eindhoven was discovered by the liberating troops to have been closed down by the accurate bombing. The Germans had taken the machinery away.

Social Security

The Government has issued White Papers setting forth its proposals for social and industrial injury insurance. The social insurance scheme (Cmd. 6550, price 6d.) covers the whole population for sickness, unemployment and pensions and provides for orphans' and family allowances. As full details have already appeared in the public Press, it is not proposed to give them here. It may be said, however, that weekly premiums are fixed for four classes of men and women. In the case of employed adult males, for instance, the payment is to be 6s. 11d. per week, of which the employer will pay 3s. 1d.; for adult women workers the corresponding figures are 4s. 6d. and 2s. 1d.

Lighting and Painting

At Manchester last week mill owners and managers were invited to an exhibition of mill lighting methods and the use of light paint to improve illumination. The exhibition, which was arranged by the district engineer of the E.L.M.A. Lighting Service Bureau, was opened by Mr. Hugh Dalton, President of the Board of Trade, and Sir Raymond Streat, chairman of the Cotton Board expressed his appreciation of this endeavour to raise the standard of mill lighting.

Fatalities

Caught in Coal Cutter.—When an inquest was held at Nottingham on Cyril Peat (38), cutting machine operator, the city coroner returned a verdict that he "died from injuries by being caught in a coal-cutting machine which unexpectedly started up." The chief electrician stated that the machine started itself, but it had been left in the "on" position contrary to general custom. The underground electrician who tried the machine out after the accident, said he found that it started five times on its own with the clutch left in. He then traced the fault to the gate-end switch box, where

there was an increase of voltage on a delicately adjusted relay. Mr. J. Lakin, who was working the machine, said that when he stopped it he did not take out the clutch, which was quite normal. The object of stopping the machine was to remove the prop. When about half-way under the prop the machine started on its own. He rushed back and switched off, but deceased was caught in the machine. He had known a similar machine to start on its own.

Shock from Electric Hammer.—While using an electric hammer, Walter Cutts (56), maintenance labourer employed by Storry, Smithson & Co., Ltd., Bankside Works, Hull, received a fatal shock. At the inquest Mr. G. D. Williamson, an electrician employed by Vic. Coupland, Ltd., electrical contractors, stated that maintenance work was being done at Storry, Smithson's mill. He tested the hammer before handing it to Cutts and it was in order then. After the accident he found that the earth connection in the wander lead was broken and there was a "short" in the hammer itself. The lead was owned by Storry, Smithson and the hammer by Vic. Coupland. It was possible that one of the defects was already there and that the other developed while Cutts was using the hammer. Evidence was given that earlier in the morning Cutts shouted to another employee that he had received a shock, and half an hour later said he had received another. A verdict of "Accidental death" was recorded.

Cleat Wire Specification

The British Standards Institution informs us that the correct price of the revised specification for lightly insulated cleat wire (B.S. No. 1096—1944) is 2s. post free and not 6d. as originally stated.

Trade with India

Messrs. Lakshmi & Co., 321, Thambu Chetty Street, Madras, India, desire to be put in touch with firms dealing in electrical and mechanical goods who will be prepared to act as purchasing agents.

Trade Announcement

The offices of the Johnson Engineering Company have been moved to 5, Spencer Street, Leamington Spa, where all correspondence should be addressed. Stocks of FHP motors will also be available at Leamington Spa. All goods must be consigned to the works and stores at 86, Great Portland Street, London, W.1.

TRADE MARK APPLICATIONS

APPLICATION has been made for the registration of the following trade mark. Objections may be entered within a month from September 20th:—

MOVIOLA. No. 628,626, Class 9. Projectors, synchronising apparatus, film measuring machines, sound reading apparatus, sound amplifiers and rewinding apparatus, all for use with cinematograph films.—Iwan Serrurier, trading as the Moviola Co., 1451, Gordon Street, Hollywood, U.S.A. Address for service: c/o Marks & Clerk, 57/8, Lincoln's Inn Fields, London, W.C.2.

Steam Superheaters

Advances in Design

SUPERHEATERS for water-tube boilers are the subject of a paper by Messrs. L. C. Southcott and D. W. Rudorff (respectively chief designer and consultant to the Superheater Co., Ltd.) submitted in London to the Institute of Fuel.

The authors briefly describe British advances in design during the past twenty years, comment on practice in the United States, outline tendencies in Germany and review the impressive progress made in the U.S.S.R. during the last decade. They recall that at the inception of the first five-year plan in 1928 there was not a single electricity generating station in Russia of a capacity of 100,000 kW. It was not until 1930 that the Shatura station reached that size, but by 1935 there were seventeen stations of 100,000 kW or more in service.

In a reference to heat-transfer investigations (with a bibliography of eleven references to Russian publications) the authors mention experiments with a model (1 to 20·6 replica) of a 165,000 lb. per hour boiler equipped for burning pulverised Donetz coal. It was built to be suitable both for testing with water and air as the flow medium, both being used for ascertaining the draught loss.

For determining the heat transfer coefficient electrically heated tubes were successively inserted in the various tube rows of the boiler. The heat loss along a particular tube was measured with the aid of a thermocouple arranged to slide within the tube. The results of these tests indicated that heat transfer coefficients exceeded the computed values by from 20 to 25 per cent.

Town and Country Planning

Committee Appointed by "Civils"

THE Council of the Institution of Civil Engineers has appointed a Town and Country Planning Committee to advise the Council on matters relating to the engineer's part in this work. The Committee takes the place of a sub-committee of the Public Relations Committee, which had been dealing with this matter previously. The new Committee will include members who are city engineers and borough surveyors and others who have specialised on roads, railways, docks, water supply, drainage including sewage disposal and electricity and gas services.

In order to enable engineers and others to keep in touch with present-day principles and ideas in planning, the Council has also arranged a series of four lectures on "The Position of the Engineer in Relation to Town and Regional Planning" on Thursdays (October 26th and November 2nd, 9th and 16th) at 5 p.m. In the lecture on November 16th Mr. J. Paton Watson (city engineer and surveyor, Plymouth) is to deal with services (electricity, water, gas and Post Office). The lectures will be open to non-members on payment of 10s. for the series, 2s. 6d. for each lecture.

Until Saturday, October 7th, the "Plan for Plymouth" exhibition will be open at the Institution every weekday from 10 a.m. to 5 p.m.; admission is free.

This Freedom

Notes on the "Design of Dwellings" Report

By Fredk. W. Purse,
M.I.E.E., M.I.Mech.E.

THE report on the "Design and Equipment of Dwellings" recently issued by the Ministry of Health, goes to swell the flood of reports on post-war reconstruction or planning. It is becoming difficult to keep pace with these and equally difficult to know of their publication or which of them does or does not concern our industry. If all the planning prescribed for the population is given effect to, the plea for some moderate restriction which I made in the *Electrical Review* of August 18th will pale into insignificance.

This report, which for brevity I will refer to as "D.O.D.", has been prepared by a committee of nineteen, of which seven were women, with a qualified woman architect as secretary. The woman's point of view is, therefore, as it should be, predominant throughout the report, and is, in fact, emphasised in the following quotation from it:—"It is in our view of the greatest importance that in designing and equipping dwellings, account should be taken of the way in which a house is run and the use which is made of the various rooms. In this matter the housewife is the expert and local authorities should have constant regard to her views." Moreover, the report does not hesitate to point out that the refinements, *e.g.*, larger kitchen to meet the woman's point of view, will cost money, but goes on to say (presumably on the standard indicated) that "extensive building is possible only if building costs bear a reasonable relationship to the general cost of living."

In this article Mr. Purse again contends that the provision of duplicate or triplicate services for heating, cooking and lighting is not consistent with the necessity for erecting and equipping houses at the lowest possible cost.

What the Committee has failed to do is to probe the possibilities of alternatives in the way of reduction in cost by limiting "freedom of choice" without entailing undue hardship. It has, nevertheless, gone some way by endorsing the report of a study group of the Ministry of Town and Country Planning, in which it is stated:—"While it is beyond question a matter of the utmost importance that everything possible should be done to satisfy individual preferences, the decision as to the type of housing to be provided cannot be founded on such an over-simplification of the problem as is involved in the asking of the question 'What do you prefer?' The answers to it are bound to be conditioned by the limitations of experience—and few terraces have been built, in this country, which embody the best principles of modern terrace design. For another thing, individual requirements have to be balanced with those of the community." Note the last eleven words which are my case in a nutshell. A similar restriction in choice is evidenced by the following statement:—"In our view, it is far better that the worker should have to travel some distance to his work than that he and his family should be remote from the school, church, shops and all the other amenities of village life."

The D.O.D. report lays stress on the necessity of standardisation of parts of dwellings. I quite agree, but this again is not freedom of choice. Why, therefore, should the cost of the new houses be inflated by freedom of choice in respect of fuel? Why not definitely restrict the use of solid fuel? Its cost of transport to and storage in the dwelling adds to the cost, and there are several references in the report regarding the difficulties in storing fuel and the cost of providing the necessary facilities. And yet, despite these objections, it is proposed to perpetuate them and add to the cost by a number of recommendations such as the provision of a fuel store, which should be easily accessible for fuel delivery, and wherever possible be reached from the backdoor under cover; a coal range in the living-room; a type of grate which is easy to clean; easy access to the fuel store; and an open fireplace. And then we find the following strange observation:—"Old people require more warmth than the young. A fireplace should therefore be provided in the bedroom as well as in the living-room." A woman is to have the greatest degree of refinement for her kitchen and housework, but the old people have to carry coal to their bedrooms, keep the fire going, clean out the ashes and carry them downstairs, with the added dirt and dust which all this entails; why does not the report complete the picture and say "Let the old people have oil lamps" instead of recommending as it does "Electricity for artificial lighting in all dwellings"?

Then D.O.D. makes a very dogmatic assertion when it states that ". . . the solid fuel appliance (whether open fire or some form of stove) is likely to remain the main

source of heat in a small house, but it should be of the most efficient type available." It goes on to say:—"Where there are services, electric or gas points will be required for auxiliary sources of heat."

This is the crux of the whole problem; so long as people are led to regard solid fuel as the main source of heat and electricity as an auxiliary, then so long will it be claimed, although not correct, that coal is cheaper than electricity. It is because electricity is used as an auxiliary, causing a big demand with a small consumption, that the cost cannot be appreciably reduced.

I know that there are a number of old-fashioned people even in our industry who say "I do like a coal fire to sit by, poke at and for knocking out my pipe." Generally speaking, they do not have to fetch and carry the coal, clean out the grates and dust the rooms, but only let them have twelve months of all this work and there is no doubt which they would then prefer. For this reason, I am surprised that D.O.D., which pays particular regard to lessening the work of the housewife, proposes to continue the drudgery of solid fuel heating.

Why a State Subsidy?

The Committee naturally expresses some fear that the standard of dwellings which it recommends will be too expensive and beyond the means of the people for whom they will be built and, without saying so, leaves the conclusion to be drawn that State subsidy will be necessary. But why should the State pay a subsidy so that the occupiers may have unnecessary freedom of choice in regard to fuel, especially when they are restricted in many other matters? By restricting the choice to all-electric (or all-gas), the occupier can have the D.O.D. standard without the increased cost or State subsidy.

We are told that the pre-fabricated houses are only to be a temporary measure, for ten years, and if so, is this not even a stronger reason for keeping down the cost by avoiding dual or triple fuel services? Where is the logic in saying that it must be a pre-fabricated house or nothing at all, and then increasing the cost, and subsequent loss when scrapped, by providing for the freedom of choice between electricity, gas and coal? Have the people in those countries without coal been handicapped in any way by having to depend upon electricity? Not so far as I am aware, and nor would we in this country once we get rid of the out-of-date idea of a coal fire. If the ill-conceived demands of the public for gas and coal as well as electricity are conceded, then for heaven's sake tell the public that they will never get *cheap* electricity in its generally accepted meaning.

Henry Ford set the pace in cheap motoring by mass production, thereby eliminating freedom of choice; cheap lighting, heating and cooking in our dwellings will only be obtained by eliminating freedom of choice, and that is the point of view which the D.O.D. Committee has failed to explore.

One other point I would refer to on the question of keeping every item of cost at a minimum. The report ventures to give some estimates of cost and economic rent, and is apprehensive that these will be beyond the means of the occupiers. I agree, and would add that the estimates appear to be over-optimistic. The half-yearly loan charges are based on a sixty-year life, but surely many of the items in a dwelling house have not a sixty-year life, including such extras as are mentioned in the report—draining boards, painting walls of bathrooms and kitchen, etc. One would, therefore, expect to find an equivalent provision for annual maintenance, but a sum of only £5 10s. per annum is allowed for repairs, etc., and this only amounts to 1·65 per cent. on the minimum pre-war standard house costing £335. Surely an inadequate amount.

Still further, although D.O.D. suggests a higher standard dwelling to cost £467, only the same amount of £5 10s. per annum is allowed for repairs, etc. It is obvious that the costs and consequent economic rent will be higher than those quoted in the report, and therefore emphasises all the more the following important statement in the report:—"There may be an inevitable interval before the present inflated costs can be brought into a workable relationship with the cost of living, but we are convinced that unless this is done the Government's programme of three to four million houses will never be completed."

Am I not, therefore, more than ever justified in earnestly pleading for the abolition of the absurd and much vaunted "freedom of choice" in respect of the fuel services for the new dwellings which the Government considers will be required in this country?

Central Design Council

ESTABLISHMENT by the Government of a Central Design Council is suggested in a memorandum by the Federation of British Industries to the Board of Trade. Such a Council, the Federation states, would act as a centre of information, advice and propaganda on the subject. It is further proposed that the various industries concerned should establish industrial design centres to conduct research and development in regard to design, in co-operation with the Central Council. The functions of the Council would include those relating to exhibitions recommended in the report of the Board of Trade Committee under Lord Gorell (Art and Industry, 1932), the organisation at the B.I.F. of a section representing the best of current British design, etc. The industrial design centres would take steps to stimulate interest and initiative in design within the industry.

Organisations of the Industry—XV

Electrical Association for Women

By Caroline Haslett,
C.B.E., Comp. I.E.E., Director

THE E.A.W. was founded in November 1924, on the realisation that the scientific discoveries of the last few generations had a real significance for the home and the housewife. Then, the reading of a paper to the Women's Engineering Society led a group of women to foresee the possibilities of "electricity for every-woman"—the housewife, the professional woman, the townswoman, the countrywoman, the bachelor girl, the mother of a family. Twenty years ago women were not informed regarding electricity as a banisher of drudgery, an aid to economy and efficiency in the home, as well as a decorative agent. The E.A.W. was founded to bring the realisation of all these benefits to the women of the country and also to increase the advantages which electricity could offer them.

Above: The Dowager Lady Swaythling, President of the E.A.W. Left: Miss Caroline Haslett, the Director

"This electric age is woman's opportunity" was an early slogan, and in the years before the war the educational work of the E.A.W. helped to translate it into a widespread fact, giving the means for leisure and fitness, nutritive food, cheerful, well-lighted and well-heated homes. The four and a half years of war have brought a universal appreciation of scientific and mechanical things, and women have played such a prominent part in their manufacture and use that they are looking forward with informed interest to enjoying the advantages of technical development applied to the home.

The early days of the Association were marked by the usual vicissitudes attending a new enterprise. As with most ventures, vision was the only sure thing at the outset, and circumstances were sometimes enough to overshadow this. The new Association shared offices by the courtesy of the Women's Engineering Society. The staff was an exceedingly small one, the Director both directing and carrying out operations. After a while, through the kindness of the late Colonel Crompton, the Association moved its headquarters to Kensington Court—an appropriate setting to stimulate the growth of an organisation of women interested in the domestic applications of electricity. Then, in 1933, more commodious premises were taken in Regent Street, where an Electrical Housecraft School was established which became a source of interest to many visitors, from overseas students of home economics to school children appreciating for the first time the range of electrical appliances for the home. In wartime distinguished diplomatic representatives from abroad and American journalists have been interested to visit it.

The Association has been fortunate in the men and women who have wished it well and have afforded generous support. Its past presidents have included the Viscountess Astor, C.H., M.P., the Lady Mount Temple, the late Margaret, Lady Moir, O.B.E., and the Dowager Marchioness of Reading, while in its present President, the Dowager Lady Swaythling, the Association has the benefit of much sound advice in addition to grace, charm and wit at its national functions. Among the well-known men who early showed faith in this young Association were Sir Andrew Duncan, Sir Archibald Page, the late Dr. de Ferranti, Mr. Herbert Morrison, the late Sir John Snell, the late Sir John Brooke, Sir Felix Pole, the late Lord Hirst of Witton, Sir John Dalton and Mr. F. S. Button.

The strength of the Association lies in its decentralisation. There are some eighty branches all over Great Britain, comprising about eight thousand women. Each branch is conducted by an energetic committee, including as officers prominent women of the district. While headquarters draws up national campaigns and arranges lectures, visits, exhibitions, conferences and special courses, all plans of work are carried out by the branches themselves, in co-operation with the electrical and educational authorities of the cities and towns of the provinces. Eight area organisers

are responsible for welding together branch work in their divisions of the country, in addition to meeting the requests for lecturers made by other women's organisations. The North-West and the Mid-East England Area have their own federations which arrange special conferences and undertake special work.

Training Demonstrators

Perhaps the most easily defined of the Association's educational activities is its work for demonstrators and saleswomen in the electrical industry. The E.A.W. early realised that if the advantages of electricity were to be easily available to all women there must be a close liaison between the electrical industry and the housewife. The efficiency of the demonstrator varied greatly, and inadequate facilities existed for her training. A scheme was therefore devised whereby a definite standard of efficiency was set up, specific qualifications were demanded, and a course of instruction was drawn up.

Normally, examinations are held twice yearly, but only once a year in wartime, on the results of which the E.A.W. Certificate in Electrical Housecraft for demonstrators and saleswomen is awarded. After four years' responsible work application may be made for the Diploma, which is the guarantee of a well-trained and experienced demonstrator. To date 913 demonstrators hold the Certificate, and 359 the Diploma.

The E.A.W. Training and Employment Committees in different parts of the country were, before the war, actively engaged in finding suitable posts for competent demonstrators and in notifying supply undertakings of qualified candidates for their vacancies. Moreover, the creation of a recognised standard of work necessitated the establishment of a proportionate salary scale, for which the E.A.W. is largely responsible. In connection with the Diploma tests the late Dr. Elizabeth Sloan Chesser presented a silver cup to be awarded to the candidate gaining the highest marks for the year. It has now been awarded seven times, and has been held by demonstrators all over the country.

To enable demonstrators to keep abreast of developments, the E.A.W. and the British Electrical Development Association have arranged an annual conference in London attended by women from different parts of Great Britain, when a special subject of practical value is studied. In wartime the demonstrator's work is largely concerned with economic and nutritive methods of cooking, particularly for communal feeding, and accordingly the course has now become a one-day conference on nutrition, diet and large-scale cookery.

Teachers of science and domestic science have expressed interest in the E.A.W.'s Certificate and Diploma scheme, as they realise that electricity is an integral part of modern life, and should be included in the normal curriculum, and that they themselves should be equipped to impart this knowledge. Now 997 teachers hold the Certificate and 83 the Diploma. Before the war annual summer schools were held in different domestic science training colleges, but this has not been practicable in wartime. Instead a very practical and popular development of the Association's work with boys and girls has been directly with the schools and youth organisations.

In 1937 the Home Workers' Course was instituted for housewives and paid home workers. In approximately ten classes simple instruction was given in the use and maintenance of domestic electrical apparatus, and a certificate was given on the results of a practical test. A special syllabus was drawn up for schools and youth organisations, and it has proved to be one of the most popular courses ; 1,037 Certificates have now been awarded. The " Councillor Miss Walter Rosebowl " is presented to the school which gains the highest marks in the practical tests throughout the year. The memory of the kindly encouragement and generous support of the late Sir John Snell is perpetuated in one of many ways by the bursary fund which he and Lady Snell inaugurated to enable the course and examination for the Home Workers' Certificate to be taken by girls who could not otherwise afford it.

National Domestic Front Campaign

The Association's peacetime activities provided a good basis for work in connection with the three main aspects of the Domestic Front Campaign—food, fuel and maintenance of clothes and household equipment. The E.A.W. Housecraft School has been used for testing wartime economy recipes and methods of nutritive and economic cooking. The results are published in the monthly " Cheerful Rationing " cards which include other household hints and have proved immensely popular. This is carried out in conjunction with the Ministry of Food. Several public meetings have been held at headquarters and in the branches and in 1940 the Minister of Food himself spoke at the annual conference.

Much has also been learnt from Allied ways of cooking. At the request of the Netherlands Minister of Education the Housecraft Kitchen is used by Englishwomen married to Dutchmen, who are taking a course in Netherlands national dishes to prepare them for life in Holland after the war. Food and cookery are among the chief items in branch programmes. Two films, showing the importance of a balanced diet and the value of vegetables were prepared and have been extensively used—" Miss T " and " Mrs. T. and Her Cabbage Patch."

Realising that the economical use of fuel

is the efficient way, the E.A.W. has contributed much to the Fuel Economy Campaign through its educational work. The E.A.W. charts explaining electricity generation, transmission and distribution, the house circuit, and the construction of domestic electrical apparatus, as well as the children's books "Electricity Without Tears" and "The Rays," have been in demand by lecturers throughout the country. The E.A.W. prepared a special booklet "Electric Economy," setting out specific ways of saving electricity on each appliance. Broadcasts, demonstrations and "Fuel Front" exhibitions have all been part of the Association's work. Close co-operation is maintained with the Ministry of Fuel and Power, and the E.A.W. Director is a member of the Publicity Committee of the Ministry and chairman of the Schools Sub-Committee.

The "Make Do and Mend" Campaign of the Board of Trade has also received support from the Association. Lectures on electrical maintenance have enabled women to understand how best to care for their apparatus and how to effect simple repairs. Many branches have organised special "Make Do and Mend" classes to renovate clothes and furnishings. The Association's quarterly journal "The Electrical Age," contains practical articles on all these subjects which are of prime importance to the wartime housewife, as well as information on the war work of women of the United Nations.

The E.A.W. has always worked closely with the Board of Education regarding the electrical housecraft instruction given in schools and colleges. The "Electrical Handbook for Women," published by the Association and now in its third edition, is the recognised textbook. "Household Electricity" was issued a few years ago as a comprehensive manual of electrical matters for the housewife. In sending evidence to the Norwood Committee on Curriculum and Examinations the E.A.W. urged the need for training in "engineering in the home" and for better equipped domestic science centres and laboratories.

Post-War Reconstruction

The E.A.W. has given much study to post-war reconstruction from the point of view of housing, education and careers. It prepared twenty-four study sheets on these subjects which were considered by the Association's own branches and many other women's organisations and individual women. The resulting expressions of opinion were all incorporated in the interim report giving the E.A.W. point of view on post-war reconstruction, issued in March, 1943. It has been well received in this country and abroad. Branch programmes have naturally been greatly occupied with these subjects, and E.A.W. members are deeply interested in women's responsibilities as citizens. Many branch officers are also members of local government committees.

The E.A.W. Director is a member of the Post-War Planning Committee of the Institution of Electrical Engineers (Panel E) and of the Electrical Installations Committee. At the request of the Ministry of Health Central Housing Advisory Committee the E.A.W. submitted evidence to the Sub-Committee on the Design and Equipment of Dwellings. The Scottish branches were asked to submit a similar document to the Department in Scotland.

National Service

The organisation of the E.A.W. enabled its branches to take an active part in many forms of National Service from the commencement of war and even before. The E.A.W. mobile canteen service has been established for four years, and operates among isolated units and dockers. Canteens and hostels for the Forces and war workers are equipped and staffed by E.A.W. branches in many parts of the country. The Northern and Scottish branches provide electrical apparatus for hospitals. All branches supply comforts for the troops on active service and in hospital. War funds now total many thousands of pounds, and the National Savings Campaign has been exceedingly well supported. £150 has been raised to provide a bed in the Women's Wing of the Stalingrad Hospital, and the North-West Area Federation has raised the money for a second bed.

The Association's interest in the training of women for technical work has been increased by wartime developments, and by the E.A.W. Director's appointment at the beginning of the War as Adviser on Women's Training to the Ministry of Labour, and membership of the Women's Consultative Committee. E.A.W. members serve on Ministry of Labour Advisory Panels. The Ministry's schemes for training canteen cooks and manageresses were welcomed by the Association.

The E.A.W., which was formed to enable the ordinary woman both to benefit from scientific advance and to take part in its development, has proved a valuable organisation of woman power to the nation at war, and one whose activities enable it to give an authoritative opinion on post-war reconstruction as it affects women.

Water Power in Spain

SPANISH financial circles think that if the entire hydraulic power of the country could be used Spain would be able to generate 27,000 million kWh annually. At present power generation amounts to 4,500 million kWh. In 1945, additional water-power plants will be put into operation, but it is considered that there will still be a deficiency of 30 per cent., reports the German official news agency from Madrid.

ELECTRICITY SUPPLY

Bolton and Leeds Extensions. Future of Loch Sloy.

Bolton.—POWER STATION EXTENSIONS.—The Central Electricity Board, with the approval of the Electricity Commissioners, has directed the Corporation to extend the Back-o-th'-Bank generating station by the installation of a turbine driven main alternator of 30,000 kW capacity and an auxiliary alternator of 1,520 kW capacity, with the necessary ancillary plant, and a boiler of 180,000 lb. of steam per hour evaporating capacity. The new plant is to be ready for commercial operation by September, 1946. Plant which will be rendered redundant will be disposed of by tender.

Dorchester.—EXTENSION TO SAWMILL.—The Electricity Committee is to provide a supply to Webb, Major & Co., Ltd., at their sawmills in Weymouth Avenue.

PUMPING PLANT.—The Water Committee is to install electric pumping plant at the waterworks at a cost of about £2,000.

Dumbartonshire.—LOCH SLOY ACQUISITION MOVE.—A decision that immediate steps should be taken for the acquisition by the Council of Loch Sloy was made at a recent meeting of the County Council. This followed consideration of a report from a committee which had been conducting negotiations with the North of Scotland Hydro-Electric Board arising from the Loch Sloy project in the Board's Constructional Scheme No. 1.

The Council, it was stated, had always regarded Loch Sloy as a natural asset of outstanding importance to Dumbartonshire. It formed an ideal site for a reservoir devoted to primary purposes, and its elevation was such that water could be sent down both sides of the county through the important residential and industrial areas up to the west and north of Glasgow. Alternative proposals had been made to the Board with a view to securing a prior right to the Council of a daily supply of water from Loch Sloy which would not have exceeded 10 per cent. of the yield of the project. The Board, however, had not seen its way to accept these proposals, and had asked that it should only be required to give the desired quantities to the County Council on terms to be afterwards fixed and after the Council had exhausted all other suitable sources of supply.

In the objections which it has lodged to the Loch Sloy scheme the County Council contends that the appropriation of the waters by the Board for the generation of electricity would result in " grave consequences " to the post-war residential and industrial development of the county.

The County Council also stresses the necessity for preserving the beauty, charm, and amenity of Loch Lomondside. The generating and pumping station and other works proposed by the scheme at Loch Lomond " infringe the planning proposals of the Council for that area and will seriously interfere with the amenity of that district."

Glasgow.—REFUSE DESTRUCTION.—The Corporation Committee on Cleansing at a special meeting considered a report on post-war position of refuse disposal works, particularly in regard to the Govan refuse power works. The director was authorised to proceed with his investigations as to the best methods to be adopted for dealing with refuse at the works after the war. Messrs. Merz & McLellan, who have reported on various aspects of the Govan works, are being asked to submit further reports, as may be necessary, on the future operation of the works based on considerable simplification of the existing system. The Committee also decided that the director should arrange for Babcock & Wilcox, Ltd., to carry out the retubing of one of the boilers at an estimated cost of £750.

Lighting system employing Revo conversion fittings at Lichfield

Ipswich.—NEW POWER STATION.—The Town Council has received the sanction for the borrowing of £1,250,000. It is building a new electric power station to cost £1,907,125.

Lichfield. — " MOONLIGHT " SYSTEM.—For a lighting scheme just completed in Market Street, Revo conversion fittings have been attached to existing lighting units. An illumination intensity of 0·2 ft.-candle is provided by this means.

Leeds.—EXTENSIONS TO BE EXPEDITED.—It was reported to the Electricity Committee last week that the Central Electricity Board had directed that the extensions planned at the Kirkstall power station must be completed by the end of 1946 instead of 1948 as originally

intended. An expenditure of nearly £2,000,000 is involved.

HIGHER CHARGES SANCTIONED.—The Ministry of Fuel and Power has sanctioned a further 5 per cent. increase in electricity tariffs other than for power, the charge for which is now governed by a coal clause. Last year, in response to the Electricity Committee's application for permission to make an all-round increase of 10 per cent., the Ministry authorised only 5 per cent. Councillor C. A. Goodall, chairman of the Committee, said that the further 5 per cent. now agreed to would no more than meet the latest advance of 4s. per ton in the price of coal.

London.—PUMPING PLANT.—The Metropolitan Water Board is to install electrically driven pumping machinery at the northern area station at a cost of £5,000. It is estimated that at present-day rates the annual saving effected by the substitution of electrical drive for steam will be £900.

Lowestoft. — STREET LIGHTING. — The Electricity Committee has approved an estimate of £1,100 for the reinstatement of public lighting.

Mid-Wales. — WATER AND ELECTRICITY SUPPLIES.—A conference of representatives of the three mid-Wales agricultural counties of Merioneth, Montgomery and Cardigan recently decided to urge the Government to move immediately to secure adequate supplies of water and electricity throughout their areas.

Penrith.—ALTERNATIVE LIGHTING PROPOSALS. —In connection with the provision of street lighting the U.D.C. Highways Committee has agreed to discuss proposals with the Penrith Electric Supply Co. The Gas Committee of the Council has submitted a proposal to provide gas for the purpose at 5d. per therm.

Portland.—YEAR'S WORKING.—The U.D.C. Electricity Committee reports a net surplus for the year of £660, compared with £1,239 the previous year.

Plymouth.—STREET LIGHTING REPAIRS.—At a cost estimated at £11,750 Plymouth Electricity and Street Lighting Committee on September 18th authorised repairs and reinstatement work to be carried out by the city electrical engineer, Mr. M. Midgley, so that Plymouth may be ready to resume street lighting when wartime restrictions are lifted.

Swanscombe.—CONTROL OF STREET LIGHTING. —The U.D.C. Highways Committee is obtaining a quotation from the Kent Electric Power Co. for a master switch for street lighting.

Nottingham's Jubilee

Speeches at Commemorative Luncheon

THE jubilee of the Nottingham Corporation electricity undertaking was celebrated by a luncheon on September 21st, with the Lord Mayor of Nottingham (Councillor F. Mitchell), chairman of the Electricity Committee, and members of the committee, as hosts. Included among the 150 guests present were representatives of the Ministry of Fuel and Power and the Central Electricity Board.

A Provisional Order was obtained in 1890 but public supply was not provided until 1894. The original power station was in Talbot Street ; eight years later two more were added, St. Ann's Well Road and Eastcroft, with plant rated at 13,730 kW.

In 1920 sanction was given for the construction of a new power station and an 80-acre site at Wilford was purchased. Alderman E. Huntsman, then chairman of the Electricity Committee, laid the foundation stone of the new building, plans for which had been prepared by the then city engineer, Mr. T. Wallis Gordon. The station was opened in 1925.

Submitting the toast of "The City of Nottingham and the Electricity Undertaking," Mr. W. S. Burge, manager, Central England, for the Central Board, spoke of the outstanding achievements of the electricity supply industry in the past 50 years. The industry had been doubling its total output every seven or eight years. Growth at that rate had meant little rest for those concerned.

Nottingham had two great assets. It was situated on a great waterway—the River Trent, and was close to the coalfields. If Nottingham put 50,000 kW into the grid it would reduce the equivalent introduced in London, resulting in a saving of some 30,000,000 ton-miles of transport per year.

Replying, the Lord Mayor commented on the early history of the undertaking and the prominent parts played by the late Alderman E. Huntsman and the city electrical engineer, Mr. G. H. Lake. Mr. Lake also responded and said that the development had been due to a progressive Council and Electricity Committee. A considerable saving in coal had been effected by newly designed plant. In its first year, this pulverised fuel plant saved some 30,000 tons of coal and greatly assisted in reducing the price of electricity. They had at present 98 per cent. of the possible consumers on the mains and progress was not static. He thanked the staff for their able and loyal co-operation.

The toast of "The Visitors," was proposed by Councillor Willbery, vice-chairman of the Electricity Committee, and responses were made by Mr. R. H. Gummer (International Combustion, Ltd.) and Mr. J. Mould, Leicester electrical engineer. Alderman H. Bowles proposed the final toast "The Chairman."

An attractive display of photographs illustrating the growth of the undertaking was staged in an ante-room.

FINANCIAL SECTION

Company News. Stock Exchange Activities.

Reports and Dividends

A. C. Cossor, Ltd.—Still further progress during the year 1943-44 was reported by the chairman, Mr. T. A. Macauley, at the annual meeting held on September 20th. The results of the subsidiary operating company, Sterling Cables, Ltd., had been equally satisfactory and he hoped that before the next meeting they would have re-arranged the interests in that company and its subsidiary, Lancashire Cables, Ltd., on terms that would result in a very substantial benefit to A. C. Cossor, Ltd. The financial position of the group as a whole had been improved during the year by approximately £125,000.

With regard to their post-war programme, the intensive research work they had been bound to carry out for wartime national needs had more than compensated them for the prolonged interruption of their normal activities, and they looked forward, therefore, to a release from all wartime restrictions in order that they might be left free to pursue the work for which they were so well equipped. Unless industry in general, and the younger industries in particular, were to be encouraged to obtain the highest degree of efficiency without political interference, then their export markets would certainly be in great danger.

The Dubilier Condenser Co. (1925), Ltd., held its annual meeting on September 25th, when Mr. G. F. Mansbridge, O.B.E., M.I.E.E. (chairman), said that, although he could not give details, he could state that further substantial progress had been made in the company's contribution to the war effort. Output had substantially surpassed all previous records. It was too early to speak of their post-war plans but constant attention was being given to the reorganisation of their business, which, while fully maintaining their contribution to the war effort, would at the same time increase their ability to compete for business at home and overseas. Special attention was being given to the technological training and education of their employees.

The Colombo Electric Tramways & Lighting Co., Ltd., records a profit for 1943 amounting to £54,178, which compares with £36,309 for the preceding year. The contribution to the contingencies account is increased from £500 to £1,500, while tax reserves receive £17,000. The dividend is maintained at 25 per cent., and £40,695 (£39,840) is carried forward. The tramway undertaking was transferred to the Colombo Municipal Council on September 1st, when, as a result of arbitration, the company received Rs. 3,633,443.00 (about £272,500) and all profits to date.

The Montreal Light, Heat & Power Consolidated is to pay a dividend of 20 cents, the usual quarterly dividend payable at the end of July having been omitted. The previous payment was 6 per cent. cash and one share in the South Mount Investment Co. on April 30th. Before this the dividends were 37 and 38 cents paid in alternative quarters.

Madras Electric Tramways (1904), Ltd., is paying a dividend of 21 per cent. on its 6 per cent. cumulative preference shares, representing arrears for the 3½ years up to June 30th last.

The Calcutta Tramway Co., Ltd., is increasing its final dividend from 4 to 5 per cent., making 7½ per cent. against 6½ per cent. for 1942.

The Nigerian Electric Supply Corporation, Ltd., besides maintaining its final dividend at 5 per cent., is paying a bonus of 2 per cent., making 10 per cent. (8 per cent.) for the year.

The Watford Electric & Manufacturing Co., Ltd., is again paying an interim dividend of 5 per cent.

The Lightfoot Refrigeration Co., Ltd., is to redeem the outstanding series of £200,000 6½ per cent. registered debentures to-morrow (September 30th) at a premium of 2½ per cent.

The London Electric & General Trust, Ltd., is to pay a final dividend of 3 per cent. (same), again making 5 per cent. for the year.

Richard Johnson, Clapham & Morris, Ltd., are paying a final dividend of 11½ per cent., again making 15 per cent. for the year.

The Altrincham Electric Supply Co., has declared an interim dividend of 6d. per share on the deferred shares.

The Brazilian Traction, Light & Power Co., announces the payment of a dividend of $1·00 per share on the no-par-value ordinary shares.

The Globe Telegraph & Trust Co., Ltd., is paying a quarterly dividend of 1 per cent. (same).

Ericsson Telephones, Ltd., are again paying an interim dividend of 5 per cent. free of tax.

The Midland Counties Electric Supply Co., Ltd., is maintaining its interim dividend at 3 per cent.

The British Aluminium Co., Ltd., is again paying an interim dividend of 3 per cent.

New Companies

Northampton Refrigerator Services, Ltd.—Private company. Registered September 14th. Capital, £2,000. Objects: To carry on the business of manufacturers of, and dealers in, refrigerators, refrigerating, cooling and ventilating plant and gas and electrical appliances and accessories, etc. Directors: W. P. Barnell and Doris M. Barnell, both of 23, Linden Road, Northampton. Registered office: 35, Newland, Northampton.

Hazel Electrical Co., Ltd.—Private company. Registered September 18th. Capital, £100. Objects: To carry on the business of electrical engineers and contractors, etc. Subscribers: A. Farmer and R. Farmer, both of 35, Oakford Road, N.W.5. Registered office: 12-13, Poultry, E.C.2.

Amalgamated Domestic Utilities, Ltd.—Private company. Registered September 9th. Capital, £5,000. Objects: To acquire the business of a sound, electrical and general engineer carried

on by L. A. M. Newton at 32, High Street, Thornton Heath, as "Ampli-Hire," etc. Directors: L. A. M. Newton, 30, Ranmore Road, Cheam, Surrey and A. J. Cottell, 22, Courtfield Rise, W. Wickham, Kent. Registered office: 32, High Street, Thornton Heath, Surrey.

Relo Household Products, Ltd.—Private company. Registered September 20th. Capital, £500. Objects: To carry on the business of manufacturers of, and dealers in, electrical and other appliances, including washing, cleaning and wringing machines, refrigerators and water softeners, mechanical, radio, electrical and general engineers, etc. First directors: L. E. Moate, 132, Station Road, N.22; and W. Divine, 45, Mitcham Lane, S.W.16. Registered office: 75-76 Wool Exchange, E.C.2.

Stordy Engineering, Ltd.—Private company. Registered September 4th. Capital £3,000. Objects: To carry on the business of heating, ventilating, electrical and general engineers, etc. The directors are; J. S. Stordy and Isabel C. Stordy, both of 16, Riley Crescent, Wolverhampton. Registered office; Midland Chambers, Princes Street, Wolverhampton.

C. H. Macvey (Aberdeen), Ltd.—Private company. Registered in Edinburgh August 14th. Capital, £500. Objects: To carry on the business of radio, electrical, motor, mechanical and general engineers, etc. Directors: A. E. Macintosh, 281, Blackness Road, Dundee, and C. Mulvey, 43, Anderson Avenue, Aberdeen. Registered office: 81, Rosemount Place, Aberdeen.

Radio-Frige Service, Ltd.—Private company. Registered September 19th. Capital, £100. Objects: To carry on the business of electrical, radio, refrigerating and general engineers, dealers and agents for wireless and television apparatus and domestic appliances, etc. Subscribers: Emily Faulkner, 15-17, Chichester Rents, W.C.2; and G. A. Crook, 24, Allison Road, N.8. Secretary: G. A. Crook.

Markins, Ltd.—Private company. Registered September 19th. Capital, £100. Objects: To carry on the business of electrical and mechanical engineers, etc. Directors: C. H. Horwood, 146, Marsh Lane, Stanmore, Middlesex and two others. Registered office: 6, Seymour Road, Chingford, E.4.

Companies' Returns

Statements of Capital

British Thomson-Houston Co., Ltd.—Capital, £4,000,000 in £1 shares (2,000 000 preference and 2,000,000 ordinary). Return dated April 3rd. 1,500,000 preference and 2,000,000 ordinary shares taken up. £3,425,310 paid. £74,690 considered as paid. Mortgages and charges: £1,111,660.

Pullar's Electric Co. (Brighton), Ltd.—Capital, £10,000 in £1 shares (all ordinary). Return dated April 7th (filed May 22nd). All shares taken up. £9,300 paid. £700 considered as paid. Mortgages and charges: Nil.

Clifford & Snell, Ltd.—Capital, £5,000 in 3,900 ordinary shares of £1 each, 4,000 deferred ordinary shares of 5s. each and 4,000 deferred "A" shares of 6d. each. Return dated April 11th. 3,338 ordinary, 4,000 deferred ordinary and 4,000 deferred "A" shares taken up. £4,188 paid on 3,338 ordinary, 3,000 deferred ordinary and 4,000 deferred "A" shares. £250 considered as paid on 1,000 shares. Mortages and charges: Nil.

Windermere & District Electricity Supply Co., Ltd.—Capital, £75,000 in £5 shares (5,000 cumulative preference, 5,000 preference and 5,000 ordinary). Return dated April 4th. 5,000 cumulative preference, 4,000 preference and 4,340 ordinary shares taken up. £23,850 paid. £42,850 considered as paid. Mortgages and charges: Nil.

Yorkshire Switchgear & Engineering Co., Ltd.—Capital, £10,000 in £1 shares. Return dated April 6th. All shares taken up. £2,964 paid. £7,036 considered as paid. Mortgages and charges: £4,000.

Lighting Accessories, Ltd.—Capital, £250 in £1 shares. Return dated April 12th. All shares taken up. £2 paid. £248 considered as paid. Mortgages and charges: Nil.

Mortgages and Charges

Primary Electrical Engineering Co., Ltd.—Mortgage on leasehold workshop No. 15, Robert Street, and cottage No. 17, Robert Street, Hollinwood, Oldham, etc., dated August 31st, to secure all moneys due or to become due from the company to Midland Bank, Ltd.

Correx Communications Equipment, Ltd.—Charge on proceeds of orders, dated September 1st, 1944, to secure all moneys due or to become due from the company to Barclays Bank, Ltd.

L. Goodman (Radio), Ltd.—Satisfaction in full on October 19th, 1943, of debenture dated May 21st, 1940 and registered June 11th, 1940, securing £900. (Notice filed September 13th.)

Home Radio (Lowestoft), Ltd.—Satisfaction in full on July 31st, of mortgage taken over on September 9th, 1934, and registered September 19th, 1935.

Liquidations

Trippe Lights, Ltd.—Meeting October 21st, at 8, Ward's End, Halifax, to receive an account of the winding up by the liquidator, Mr. P. Lockwood.

Staveley Electric Supply Co., Ltd.—Winding up voluntarily. Liquidator, Mr. J. Gadsby, 17, Gluman Street, Chesterfield.

Clowne Electric Supply Co., Ltd.—Winding up voluntarily. Liquidator, Mr. J. Gadsby, 17, Gluman Street, Chesterfield.

Bankruptcies

W. H. Axworthy, electrical contractor, John Lane, Cobourg Street, and lately at New Town Chambers, Old Town Street, and previously at 106, Tavistock Road, Plymouth.—Application for discharge to be heard on October 18th at 4, Elliott Street, The Hoe, Plymouth.

H. C. Casselden, radio and electrical dealer, 67, London Road, Brighton.—Receiving order dated December 1st, 1943, rescinded on September 6th, as debts have been paid in full.

STOCKS AND SHARES

TUESDAY EVENING.

WITH each successive week the war news is read as indicating a shortening of the probable length of hostilities in Europe. The effect of the increasing pressure upon the enemy is welcomed in Stock Exchange markets by a steadier tendency that has developed amongst industrial shares. As peace draws nearer, so do the post-war problems loom the larger, but these problems, it is felt, can be tackled without their causing any serious dislocation of business. Nor should they bring about any limitation of the export trade which will be so essential in providing interchange of commodities, machinery, and equipment, and the manifold requirements of nations exhausted by the years of war. On this account it is taken for granted that companies connected with electrical work of any description will be in the forefront of industrial expansion, seeing that they will be called upon to supply home necessities, as well as the demands from overseas.

Rally in Prices

Home electricity supply shares retain their strength. The market was one of the few which stood up to the depression that spread throughout the Stock Exchange a fortnight ago. In the Overseas group, Victoria Falls ordinary are $\frac{1}{16}$ higher at 85s. Montreal Power at 24¼ have gained half a point. Dollar stocks, in other markets, show advances in sympathy with the more confident tone lately evidenced in New York. Brazilian Tractions at 26½ are 1⅜ higher on a raising of the dividend to 2 per cent. for the year. Amongst home transport issues, British Electric Traction deferred has recovered 25, to 1225. Southern Railway preferred is 10s. higher at 74. London Passenger Transport "C" is dull at 67. In the gilt-edged group, prices are maintained by the consistent volume of buying on behalf of Safety First investment.

Equipment and Manufacturing

Recovery followed fairly soon upon the weakness reflected in our price-lists last week. Tube Investments are 2s. 3d. higher at 94s. 9d. General Electrics rose to 91s. 9d., Henley's to 26s. 3d., Enfield Cables to 59s., gains of 1s. in each case.; English Electrics to 50s. 6d. and Hopkinsons to 69s. 3d. Automatic Telephones at 60s. xd. are $\frac{1}{16}$ better, allowing for the dividend. Not all the changes are in favour of holders. British Insulated at 5⅜ xd. and Callender's at 5¼ have lost 9d. and 1s. 3d. respectively. Revo are lower at 41s. 3d. In spite of the return of purchasing power, there still remains a feeling of uncertainty as to what is likely to happen when peace comes.

The previous malaise seemed to be somewhat illogical, for it is clear that industrial companies, particularly those engaged in the heavy and allied industries, will have as much work as they can cope with after the end of the war. Moreover, if taxation should undergo any change, it will be lightened in one way or another. The Stock Exchange is not, however, a bull of logic in the ordinary way. The crest of the upward wave having been reached last month, its subsidence was quickly noted by a large circle of shareholders in industrial companies. This served to bring about realisations which were unexpected, and against which there was, for a brief space of time, no worthwhile buying to offer opposition. When the tide turned, buyers with one accord wanted to pick up stock—at the lowest of the prices reached in the depression. But few of the bargain-hunters were successful, because the previous selling had been on no large scale.

Radio Shares

The hopefulness which has raised the prices of shares in companies connected with the radio industry receives further stimulus from the chairman's speech at the meeting of A. C. Cossor, Ltd., and the statement by Mr. Leslie McMichael, of McMichael Radio, Ltd., with reference to developments which are likely to become revealed as soon as the war is over. Cossor's chairman said that he was precluded from giving precise particulars, but he mentioned that they were working to capacity, largely on nationally important work. The financial position had been strengthened and the profits of the subsidiary company, Sterling Cables, had been retained in the business. Cossor shares are 9d. higher, at 24s. 9d. Mr. McMichael is convinced that after the war the British radio industry's prospects will be very bright. He made a reference, of course, to the extension of television, and added there could be little doubt that all nations would require radio equipment after the war, a good proportion of which should be produced in this country. E.M.I. shares are 6d. lower at 33s. 6d. E. K. Cole rose 9d. to 31s. 6d. and Philco at 12s. 9d. are a little better.

Telephone Rentals

The chairman at the Telephone Rentals meeting, reported in last week's *Electrical Review*, mentioned with natural satisfaction that the previous bank overdraft of £51,000 had been converted into a cash balance of £19,328. "A very satisfactory feature of the business we have done for the year under review is that it has come to us unsought." Telephone Rentals, Ltd., is a holding company, formed to take over certain telephone investments from the Telephone Manufacturing Co., Ltd. It now owns the capital of a number of companies engaged in the

(*Continued on page* 466)

ELECTRICAL INVESTMENTS

Prices, Dividends and Yields

Company	Dividend Previous	Dividend Last	Middle Price Sept. 26	Rise or Fall	Yield p.c. £ s. d.
Home Electricity Companies					
Bournemouth and Poole	12½	12½	64/6	..	3 17 4
British Power and Light	7	7	33/6	..	4 3 7
City of London	7	5½	30/–	..	3 13 4
Clyde Valley	8	8	42/–	..	3 16 0
County of London	8	8	44/6	..	3 12 1
Edmundsons:					
7% Pref.	7	7	34/6	..	4 1 4
Ord.	6	6	31/–	..	3 17 5
Elec.Dis.Yorkshire	9	9	45/6	..	3 19 6
Elec. Fin. and Securities	12½	13½	60/–	..	4 10 0
Elec. Supply Corporation	10	10	48/6xd	..	4 2 4
Isle of Thanet	Nil	Nil	19/6	..	—
Lancs. Light and Power	7½	7½	37/–xd	+3d.	4 1 1
Llanelly Elec.	6	6	26/6	..	4 10 7
Lond. Assoc. Electric	3	4	25/6	..	3 2 9
London Electric	6	6	30/6	..	3 18 8
LondonPowerRed. Deb.	5	5	103½	..	4 16 7
Metropolitan E.S.	8	8	44/–	..	3 12 9
Midland Counties	8	8	41/6	..	3 17 0
Mid. Elec. Power	9	9	44/–	..	4 1 9
Newcastle Elec.	7	7	31/6	..	4 9 0
North Eastern Elec. Ordinary	7	7	35/–	..	4 0 0
7% Pref.	7	7	35/–	..	4 0 0
Northampton	10	10	50/6	..	3 19 6
Notting Hill 6% Pref. (£10)	6	Nil	11	..	—
Northmet Power: Ordinary	7	7	44/6	..	3 2 9
6% Pref.	6	6	30/6	..	3 18 8
Richmond Elec.	6	6	25/6	..	4 14 1
Scottish Power	8	8	41/–xd	..	3 18 2
Southern Areas	5	5	23/–	..	4 7 0
South London	7	7	29/–	..	4 16 7
West Devon	5	5	23/6	..	4 5 1
West Glos.	4½	3½	24/6	..	2 17 0
Yorkshire Elec.	8	8	43/–	..	3 14 5
Overseas Electricity Companies					
Atlas Elec.	Nil	Nil	7/6	..	—
Calcutta Elec.	6*	6*	47/–	..	2 11 0
Cawnpore Elec.	10	7	40/–	..	3 10 0
East African Power	7	7	34/6	..	4 1 4
Jerusalem Elec.	7	5	29/6	..	3 8 0
Kalgoorlie (10/–)	5	5	11/6	..	4 7 0
Madras Elec.	4*	Nil	30/–	..	—
Montreal Power	1½	1½	24¼	+½	—
PalestineElec."A"	5*	5*	40/–	..	2 10 0
Perak Hydro-elec.	6	7	14/–	..	—
Shawinigan Power	83cts.	90cts.	16	..	—
Tokyo Elec. 6%	6	6	28	..	—
VictoriaFallsPower	15	15	4¼	+1/16	3 10 7
WhitehallInv.Pref.	—	6	25/6xd	..	4 14 0

Company	Dividend Previous	Dividend Last	Middle Price Sept. 26	Rise or Fall	Yield p.c. £ s. d.
Public Boards					
Central Electricity: 1955–60 (Civil Defence)	3	3	100	..	3 0 0
1955–75	5	5	114½	..	4 7 4
1951–73	4½	4½	107	..	4 4 1
1963–93	3½	3½	104½	..	3 7 0
1974–94	3¼	3¼	101	..	3 4 4
London Elec. Trans. Ltd.	2½	2½	97½	..	2 11 3
London & Home Counties 1955–75	4½	4½	112	+1	4 0 4
Lond.Pass.Trans.Bd. A	4½	4½	120½	..	3 14 8
B	5	5	121½	..	4 2 4
C	3	3¼	67	..	4 17 0
West Midlands J.E.A. 1948–68	5	5	106½	–1	4 14 0
Telegraph and Telephone					
Anglo-Am. Tel.: Pref.	6	6	121½	..	4 18 9
Def.	1½	1½	30	..	5 0 0
Anglo-Portuguese	8	8	28/6	..	5 12 4
Cable & Wireless: 5½% Pref.	5½	5½	115	..	4 15 1
Ord.	4	4	82	+1	4 17 9
CanadianMarconi$1	Nil	4cts.	9/–	..	—
Globe Tel. & Tel.: Ord.	8¼*	5*	40/–	..	2 10 0
Pref.	6	6	30/–	..	4 0 0
Great Northern Tel. (£10)	Nil	Nil	30	..	—
Inter. Tel. & Tel.	Nil	Nil	21	–½	—
Marconi-Marine	7½	7½	36/–	..	4 3 4
Oriental Tel. Ord.	16	10	51/–	–9d.	—
Telephone Props.	Nil	6	22/6	+1/16	5 6 8
Tele. Rentals (5/–)	10	10	11/3	..	4 9 0
Traction and Transport					
Anglo-Arg. Trans.: First Pref. (£5)	Nil	Nil	2/6	..	—
4% Inc.	Nil	Nil	7	..	—
Brit. Elec. Traction: Def. Ord.	45	45	1225	+25	3 18 6
Pref. Ord.	8	8	180	..	4 9 0
Bristol Trams	10	10	57/–	..	3 10 2
Brazil Traction	1¾	2	26¼	+1⅜	7 11 0
Calcutta Trams.	6½	7½	65/6	+5/–	2 5 9
Cape Elec. Trams	5	6	25/6	..	4 14 1
Lancs. Transport	10	10	45/6	..	4 8 0
Mexican Light: 1st Bonds	5	5	105½	..	4 14 9
Rio 5% Bonds	5	5	105½	..	4 14 9
Southern Rly.: 5% Prefd.	5	5	74	+½	6 15 2
5% Pref.	5	5	114⅜	–1	4 7 4
T. Tilling	10	10	60/–	..	3 6 8
West Riding	10	10	46/–xd	..	4 7 0

(*Continued on next page*)

* Dividends are paid free of Income Tax.

Company	Dividend Previous	Dividend Last	Middle Price Sept. 26	Rise or Fall	Yield p.c.
Equipment and Manufacturing					
			£ s. d.		
Aron.Elec.Ord. ..	10	15	61/–	..	4 18 4
Assoc. Elec. :					
Ord.	10	10	50/6	..	3 19 4
Pref.	8	8	39/–	..	4 2 0
AutomaticTel.&Tel.	12½	12½	60/-xd	+½	4 3 4
Babcock & Wilcox	11	11	49/6	+6d.	4 8 9
British Aluminium	10	10	47/6	−6d.	4 4 4
British Insul. Ord.	20	20	5¾xd	−9d.	3 14 6
British Thermostat (5/–)	18½	18½	20/–	..	4 12 6
British Vac. Cleaner (5/–)	15	30	29/–	..	5 3 5
Brush Ord. (5/–)	8	9	10/9	..	4 3 9
Burco (5/–) ..	15	17½	17/–	..	5 3 0
Callender's ..	15	20	5¼	..	3 16 2
ChlorideElec.Storage	15	15	88/9	..	3 6 7
Cole, E. K. (5/–)	10	15	31/6	+9d.	2 7 9
Consolidated Signal	24	27½	6⅝	−⅛	4 3 6
Cossor, A. C. (5/–)	7½*	10*	24/9	+9d.	2 0 0
Crabtree (10/–) ..	17½	17½	41/–	−6d.	4 5 4
Crompton Parkinson Ord. (5/–) ..	20	22½	32/–	..	3 7 3
E.M.I. (10/–) ..	6	8	33/6	−6d.	2 7 9
Elec. Construction	10	12½	60/–	..	4 3 4
Enfield Cable Ord.	12½	12½	59/–	+1/–	4 4 6
English Electric..	10	10	50/6	+6d.	3 19 0
Ensign Lamps (5/–)	25	15	21/3	..	3 10 8
Ericsson Tel. (5/–)	22*	20*	51/3	..	1 19 1
Ever Ready (5/–)	40	40	41/-	−6d.	4 17 5
Falk Stadelmann	7½	7½	34/6	..	4 7 0
Ferranti Pref. ..	7	7	31/3	..	4 9 7
G.E.C. :					
Pref.	6½	6½	32/6	..	4 0 0
Ord.	17½	17½	91/9	+1/–	3 16 9
General Cable (5/–)	15	15	15/–	..	5 0 0
Greenwood & Batley	15	15	43/9	..	6 17 0
HallTelephone(10/–)	12½	12½	30/6	..	4 2 0
Henley's (5/–) ..	20	20	26/3	+1/–	3 16 0
4½% Pref. ..	4½	4½	24/–	..	3 15 0
Hopkinsons ..	15	17½	69/3	+6d.	5 1 1
India Rubber Pref.	5½	5½	23/–	..	4 15 9
Intl. Combustion	30	30	6¾	..	4 10 8
Johnson & Phillips	15	15	75/–	..	4 0 0
Lancashire Dynamo	22½	22½	93/6xd	..	4 16 5
Laurence,Scott(5/–)	12½	12½	13/6	..	4 12 7
London Elec. Wire	7½	7½	37/6	..	4 0 0
Mather & Platt..	10	10	52/6	..	3 16 0
Metal Industries (B)	8	8½	50/6	..	3 7 6
Met.Elec.CablePref.	5½	5½	21/3	..	5 3 6
Murex	20	20	96/3	..	4 3 4
Pye Deferred (5/–)	25	25	35/–	..	3 11 5
Revo (10/–) ..	17½	17½	41/3	−1/9	4 5 0
Reyrolle ..	12½	12½	72/6	..	3 9 1
Siemens Ord. ..	7½	7½	34/–	..	4 8 3
Strand Elec. (5/–)	7½	10	8/–	..	6 5 0
Switchgear & Cowans (5/–) ..	20	20	19/–	..	5 5 1
T.C.C. (10/–) ..	5	7½	22/6	..	3 6 8
T.C. & M. ..	10	10	56/–	..	3 11 6
TelephoneMfg.(5/–)	9	9	11/6	..	3 18 3
Thorn Elec. (5/–)	20	20	25/–	..	4 0 0
Tube Investments	20	20	94/9	+2/3	4 4 5
Vactric (5/–) ..	Nil	22½	16/9	−3d.	6 14 3
Veritys (5/–) ..	7½	7½	8/–	..	4 13 9
Walsall Conduits(4/–)	55	55	49/6	..	4 9 0
Ward & Goldstone (5/–).	20	20	28/9	..	3 13 6
WestinghouseBrake	12½	14	75/–	..	3 14 8
West, Allen (5/–)	7½	7½	7/9	..	4 16 0

* Dividends are paid free of Income Tax.

Stocks and Shares (*Continued from page* 464)

installation of private telephones. Eleven of these subsidiaries operate in Great Britain, the others in Belgium, France, Ireland and Spain. The company also took power to maintain and work private and other telephones and telegraphs. The issued capital is £800,000 in 5s. shares. The company again paid 10 per cent. for the year ended May 31st last for the eighth successive year. The price of the shares stands at 11s. 3d. and the yield on that basis is £4 9s. per cent.

Calcutta Trams

From their recent lowest price of 59s., Calcutta Electric Trams recovered to 65s. 6d. upon declaration of a dividend making 7½ per cent. for the year against 6½ per cent. for 1942. The report shows that the company enjoyed remarkable success in 1943, the traffic receipts being increased by 50 per cent. as compared with the previous year. Taxation, however, bit heavily into the profits. The report makes no reference to the Bengal Government's demand for details and conditions of the intended sale of the undertaking to the Calcutta Corporation, but no doubt the chairman will have something to say about it at the meeting on October 10th. As, however, the purchase price depends to some extent upon the earnings for the current year, 1944, it is unlikely that any detailed information can be given.

Madras Electric

On the same day that the Calcutta Tramways declared its increased dividend, the Madras Electric Tramways (1904) announced the payment of 21 per cent., less tax, on its 6 per cent. cumulative preference shares, clearing off all arrears. The price in the market is 20s. bid. The ordinary shares are held by the Madras Electric Supply Co., whose own ordinary are quoted at 30s. The latter went dividendless last year, but the price indicates anticipation of an early distribution. India's financial prosperity has been the subject of comment here on various recent occasions ; the scope for industrial enterprise after the war will be enormous.

Nigerian Electricity ordinary shares rose 4s., to 35s., upon declaration of a dividend of 8 per cent., and a bonus of 2 per cent. Last year there was no bonus.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (1s. each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

AKT.-GES. Brown, Boveri & Cie.—"Exhaust gas turbo-chargers." 7395/43. May 2nd, 1942. (563918.)

C. A. Barron and H. D. Barron.—"Drawing drums for wire-drawing machines." 8389. May 26th, 1943. (564039.)

British Brown-Boveri, Ltd., and H. Oswald.—"Electrically heated kilns." 5492/3. April 6th, 1943. (563979/0.)

British Thomson-Houston Co., Ltd.—"Electric battery servicing apparatus." 2539/43. February 17th, 1942. (564033.) "Frequency modulation apparatus." 8573/43. May 28th, 1942. (564045.) "Electric circuit-breakers with arc extinguishing devices." 8693/43. May 29th, 1942. (564050.)

British Thomson-Houston Co., Ltd., and W. J. Scott.—"Thermal responsive glow discharge switches." 8767. June 1st, 1943. (564052.)

L. J. Burton and A. E. Perkins.—"Machines for winding wire upon a core." 2820. February 19th, 1943. (563916.)

E. K. Cole, Ltd., and A. E. King.—"Magnetic dust cores for inductance coils." 8637. May 31st, 1943. (564047.)

Donovan Electrical Co., Ltd., and J. W. Fair.—"Dual circuit control switches." 1599. January 30th, 1943. (563911.)

Foster Transformers & Switchgear, Ltd., and R. Gretton-Lowe.—"Electrical connectors and couplings for electric conductors." 723. January 14th, 1943. (563909.)

P. Horan.—"Apparatus for unwinding the strands of a wire rope, cable or the like to facilitate splicing." 2673/43. January 31st, 1942. (563914.)

S. T. Hosken.—"Clamping-device for connecting the ends of broken cables or the like." 8945. June 3rd, 1943. (564055.)

Landis & Gyr Soc. Anon.—"Electric clock installations." 8918/42. July 31st, 1941. (564023.)

Marconi's Wireless Telegraph Co., Ltd.—"Devices including hollow structures required to be mounted on panels or the like." 3274/43. February 28th, 1942. (563951.) "Phase modulation receivers." 8139/43. May 23rd, 1942. (564014.) "Frequency modulation systems." 8432/43. May 27th, 1942. (546041.)

Micafil, Ltd.—"Machine for winding the stators of electric motors." 11183/42. August 5th, 1941. (563932.)

M-O Valve Co., Ltd., and T. F. B. Hall.—"Cooling fins for electric-discharge devices." 710. January 16th, 1942. (564022.)

Okonite Co.—"Telephone cables." 7919/43. July 3rd, 1942. (564008.) "Electric cables." 8514/43. July 3rd, 1942. (564044.)

J. O. Ortiz and A. S. Marti.—"Electric switches with rotary contact members." 8331. May 25th, 1943. (564021.)

H. J. Osborn and Bio Electrics, Ltd.—"Electric soldering irons." 7391. May 10th, 1943. (564005.)

Ransomes, Sims & Jefferies, Ltd., and D. P. Ransome.—"Electric controllers and contacts therefor." 7960. May 19th, 1943. (563923.)

A. Reyrolle & Co., Ltd., J. W. Bayles and A. T. Robertson.—"Variable impedance chokes." 3294. March 1st, 1943. (563952.)

F. Sauter Akt.-Ges. Fabrik Elektr. Apparate.—"Automatic expansion valve, particularly for small refrigerators." 5543/43. April 30th, 1942. (563981.)

Standard Telephones & Cables, Ltd.—"Electron lens." 6854/43. May 7th, 1942. (564003.)

Westinghouse Electric International Co.—"Expulsion - type excess - voltage protective devices." 348/43. January 7th, 1942. (563908.) "High-voltage disconnect switches." 7980/43. May 19th, 1942. (563924.)

G. F. Wittgenstein.—"Selective locking device for telephone calling dials." 8538/42. August 6th, 1941. (563931.)

Forthcoming Events

Friday, September 29th.—*London.*—At 39, Victoria Street, S.W.1. 6.30 p.m. Junior Institution of Engineers. Paper on "Engineering in New Zealand," by S/Ldr. W. G. Woodward.

Monday, October 2nd.—*Manchester.*—At Engineers' Club. 6.30 p.m. Women's Engineering Society. Lecture on "The Cathode Ray Oscilloscope and its Uses," by Capt. D. K. C. Macdonald.

Liverpool.—At Royal Institution, Colquitt Street, 5.30 p.m. I.E.E. Mersey and North Wales Centre. Address by the chairman, Mr. J. Cormack, on "Some Thoughts on Education."

Birmingham.—At James Watt Memorial Institute. I.E.E. South Midland Centre Radio Group. "Energy Conversions in Electronic Devices," by Dr. D. Gabor.

Friday, October 6th.—*London.*—At 39, Victoria Street, S.W.1. 6.30 p.m. Junior Institution of Engineers. Discussion on "Proposed Formation of a Research Section," to be opened by Mr. S. J. Moor.

Manchester.—At Engineers' Club. 6.30 p.m. Manchester Association of Engineers. Inaugural address by the president, Mr. H. H. Asbridge, M.B.E.

Tuesday, October 10th.—*London.*—At Lighting Service Bureau, 2, Savoy Hill, W.C.2, 5 p.m. Illuminating Engineering Society. Presidential address by Mr. E. Stroud.

Thursday, October 12th.—*London.*—Waldorf Hotel, Aldwych. 12.30 for 1 p.m. I.E.E. Installations Section informal luncheon.

London.—Connaught Rooms, W.C.2. 12.30 for 1 p.m. Annual luncheon of Institute of Fuel. 2.15 p.m. Annual meeting and Melchett Lecture.

Exeter.—Royal Clarence Hotel. 3 p.m. I.E.E. Devon & Cornwall Sub-Centre. Inaugural address by the chairman, Mr. F. E. Pitt.

CONTRACT INFORMATION

Accepted Tenders and Prospective Electrical Work

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses.

Fife.—October 2nd. County Council Catering Committee. Various works, including electrical, at central kitchens at Cowdenbeath and Cupar. Schedules from the surveyors, C. R. Douglas & Son, 15, East Port, Dunfermline (£1 1s.).

New Zealand.—November 28th. Public Works Department. Plant for Maraetai power station and 200-kV substations; turbine and generator plant; transformers; switchgear; synchronous condensers; overhead travelling crane.

North-West Midlands.—October 10th. Joint Electricity Authority. Various works in connection with new power station. Forms of tender and specification may be obtained from Sir Alexander Gibb & Partners, Queen Anne's Lodge, Westminister, London, S.W.1 (returnable deposit £5 5s.).

Plymouth.—September 30th. City Electricity Department. Low-voltage distribution board with accessories, and two outdoor transformers. (September 15th.)

Orders Placed

Dudley.—Lighting Committee. Accepted. Conversion of 70 lamps at 15s. each and 300 at 10s. each.—S.W.S. Electric Power Co. Twelve electric heating plates for police boxes (£27).—Revo Electric Co., Ltd.

London. — Metropolitan Water Board. Accepted. Rotor resistance speed controller for electric motor, Streatham (£84).—Contactor Switchgear, Ltd. Rewinding DC generator for AC and supplying motor and starter, Hampton (£73).—George Kent, Ltd. Motor for operating electric coal transporter, Hammersmith (£72).—G.E.C.

ISLINGTON. — Borough Council. Libraries Committee. Accepted. Alterations to electrical installation at the central library (£207). — Sandilands.

Warrington.—Battery for Transport Department; Chloride Electrical Storage Co.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Bangor.—Hospital, Penrhosgarnedd Road, for Joint Hospital Board of Caernarvonshire and Bangor; secretary, Shirehall, Caernarvon.

Blackley.—Joinery works additions, Westgate Street, for F. Trow; J. Williams, architect, 1, Churchill Street, Openshaw.

Bolton.—Catholic School, Shackleton Grove; Rev. Fr. C. Chronnell, St. Edmund's Rectory, Bolton.

Chesterfield.—Hospital for Board of Royal Hospital; M. H. Boone, secretary.

Coventry.—Junior and infants' school, Foxford, and extensions at school at Binley; D. F. E. Gibson, city architect, 1a, Warwick Row.

Guildford.—Nurses' home, Royal Surrey County Hospital, Farnham Road; governors.

Nursery, Shepherd's Hill; borough engineer.

Alterations and additions, offices and works, Woodbridge Road; Trade Radio Service, Ltd.

Harrogate.—Erection of central kitchen on site adjoining Oatlands Council School; borough surveyor, Municipal Offices.

Hebburn-on-Tyne.—Works extensions; Pyrotenax, Ltd.

Heston and Isleworth.—Erection of nursery school, Syon Lane; H. Swann, town clerk, Council House, Hounslow.

Ipswich.—Proposed college; borough surveyor, Town Hall.

King's Lynn.—Housing scheme, Wootton Road; Carnell and W. Dymoke White, architects, Paradise Chambers, King's Lynn.

Middlesbrough.—Factory, Guisborough area, for Mr. A. Edwards, M.P. for Middlesbrough East.

Nairn.—Manse, Moyness, to replace building destroyed by fire; minister.

Oldham.—Extensions, Hathershaw Council School; Squire Ashton & Sons, Ltd., builders, Cheapside, Oldham.

School, Derker; G. E. Hardy, borough engineer, 75, Union Street.

Rochdale.—Houses; W. R. Davidge, architect, 5, Victoria Street, S.W.1.

Sawbridgeworth.—Crematorium; N. M. Priestland, clerk to U.D.C., The Forbury, Sawbridgeworth, Herts.

Stretford.—Works additions, Winster Avenue; J. Maunders & Sons, Ltd., builders, 21, Grange Avenue.

Swansea.—Crematorium; borough engineer.

Community centre, St. Thomas site (£6,000); borough architect.

Turton.—Homes (£54,000) and School (£30,000) at Edgworth; secretary, National Children's Homes and Orphanages, Edgworth, Turton, Lancs.

Tynemouth.—Extensions to school; borough engineer.

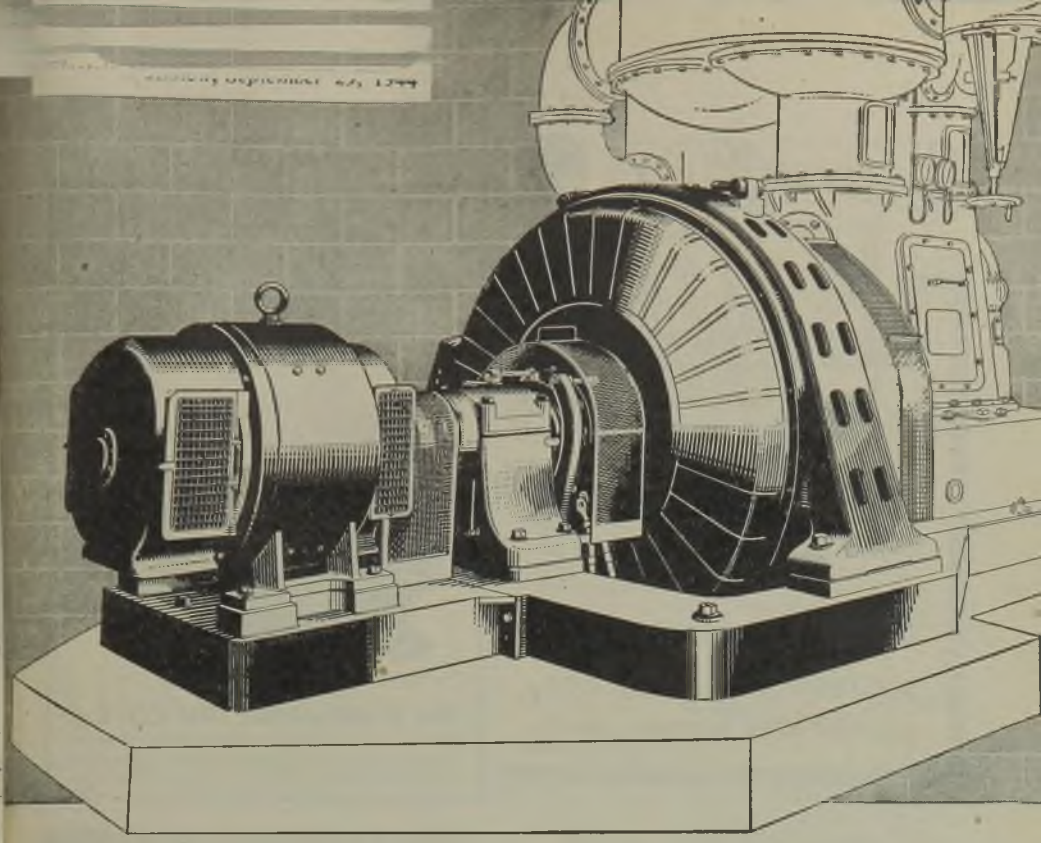
Warrington.—Dining hall at Hefferton Grange Sanatorium; J. Y. Hughes, borough surveyor, Municipal Buildings.

Warehouse, Hoyle Street; C. J. Newton, Ltd.

Wellingborough.—Houses, Croyland Hall estate for U.D.C.; R. Kilby, surveyor, Council offices.

Wellington (Salop).—Pumping station and water supply works, Lilleshall; A. H. S. Waters, engineer, 25, Temple Row, Birmingham, 2.

Willenhall.—Library and youth club (£80,000), for Willenhall Youth Committee; C. E. Millard, vice-chairman.



The Power Factor. This 680 B.H.P. Crompton Auto-Synchronous Motor drives an air compressor and at the same time corrects the power factor of the system. Crompton A.S. Motors have quickly saved their cost by this double duty in innumerable installations.

CROMPTON PARKINSON
LIMITED
ELECTRA HOUSE, LONDON, W.C.2 *and Branches*

G.E.C.

in war — as in peace —

at the service of the Empire

G.E.C. electric traction equipment for railway, tramway and trolley-bus systems has helped to achieve many proud records of service, both in peace and war, by public transport undertakings in Great Britain and overseas.

During the war the vast G.E.C. technical and manufacturing resources are devoted to one purpose—providing equipment to help win the war quickly.

When peace comes, however, the important advances made by the Company in all applications of electricity, including electronics, as a result of the urgent and numerous problems arising from the needs of war, will be available to all concerned with reconstruction.

Electrification Schemes

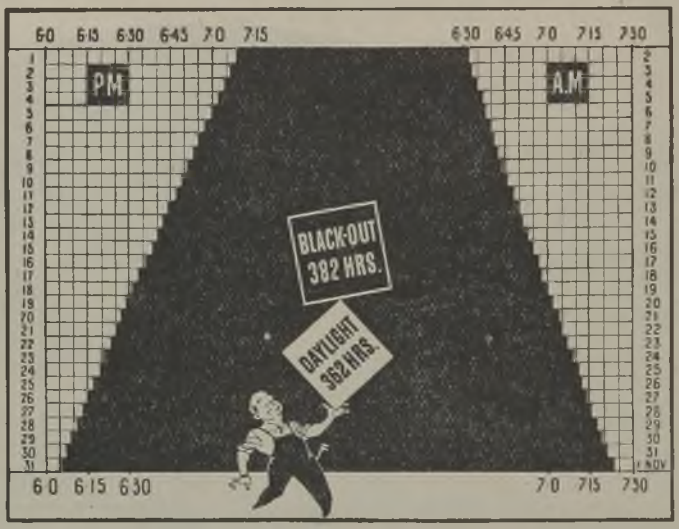
G.E.C. Electrification Schemes have been applied to all industries, including: Aircraft Factories; Chemical Works; Collieries; Food Factories; Gold Mines; Iron, Steel and Copper Works; Locomotive and Railway Carriage and Wagon Works; Motor Car Works; Ships and Shipyards; Textile Mills, etc., etc.

G.E.C. always in the forefront of electrical progress

THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2

"Stand Easy" black-out . . .

BLACK-OUT CHART FOR OCTOBER



★*Times shown are those for the London area.*

Reproduced from the Nautical Almanac by permission of the Controller of H.M. Stationery Office

Although black-out restrictions have been eased, it is still necessary at the time of going to press partially to black-out every day and carry out full black-out during alerts. Therefore you need to know the black-out times. Nevertheless we hope by the time this announcement is published that the black-out will have been completely abolished then we can all Light up and Smile with Osram.

Osram

A G.E.C. PRODUCT

THE WONDERFUL LAMP

Advt. of The General Electric Co. Ltd., Magnet House, Kingsway, London, W.C.2.

CLASSIFIED ADVERTISEMENTS

ADVERTISEMENTS for insertion in the following Friday's issue are accepted up to **First post on Monday,** at Dorset House, Stamford Street, London, S.E.1.

THE CHARGE for advertisements in this section is 2/- per line (approx. 8 words) per insertion, minimum 2 lines 4/-, or for display advertisements 30/- per inch, with a minimum of one inch. Where the advertisement includes a Box Number there is an additional charge of 6d. for postage of replies.

SITUATIONS WANTED. — Three insertions under this heading can be obtained for the price of two if ordered and prepaid with the first insertion.

REPLIES TO advertisements published under a Box Number if not to be delivered to any particular firm or individual should be accompanied by instructions to this effect, addressed to the Manager of the ELECTRICAL REVIEW. Letters of applicants in such cases cannot be returned to them. The name of an advertiser using a Box Number will not be disclosed. All replies to Box Numbers should be addressed to the Box Number in the advertisement, c/o ELECTRICAL REVIEW, Dorset House, Stamford Street, London, S.E.1. Cheques and Postal Orders should be made payable to ELECTRICAL REVIEW LTD. and crossed.

Original testimonials should not be sent with applications for employment.

SITUATIONS VACANT

None of the vacancies for women advertised in these columns relates to a woman between 18 and 41 unless such woman (a) has living with her a child of hers under the age of 14, or (b) is registered under the Blind Persons Acts, or (c) has a Ministry of Labour permit to allow her to obtain employment by individual effort.

METROPOLITAN BOROUGH OF FULHAM

Electricity Department

Assistant Operating Engineer

APPLICATIONS are invited for the position of Assistant Operating Engineer at the Fulham Base Load Station. Applications will be considered only from persons who:—

(a) are under 40 years of age;
(b) have had a sound technical education;
(c) have had a sound technical training;
(d) possess qualifications which include Mechanical, Electrical, Boiler House and Turbine Room experience in a senior capacity;
(e) have been an authorised person to operate on E.H.T. Switchgear;
(f) have had considerable experience in the Control and Organisation of Labour.

The position is in Class L, Grade 7, plus 10%, of the National Joint Board Schedule, with a commencing salary of £665 5s. 7d. per annum subject to superannuation deduction.

The Fulham Station is a base load station, the ultimate designed capacity being 310,000 kW.

Further particulars and form of application will be forwarded on receipt of stamped addressed foolscap envelope.

Applications, endorsed "Assistant Operating Engineer," must be received not later than noon on Monday, 16th October, 1944.

WILFRED TOWNEND,
Town Clerk.

Town Hall,
Fulham, S.W.6. 708

COUNTY BOROUGH OF ST. HELENS

Electricity Department

APPLICATIONS are invited for the appointment of Power Station Superintendent at a salary in accordance with Class G, Grade 3, of the N.J.B. Schedule, commencing at £611 per annum.

Candidates should preferably be not more than 45 years of age, hold Corporate Membership of the Institution of Electrical Engineers or the Institution of Mechanical Engineers, and have had thorough experience in the efficient operation and maintenance of modern Turbo Alternator and Steam Raising Plant.

Applications, accompanied by copies of not more than three testimonials, must be made on the form obtainable from the Borough Electrical Engineer, Electricity Works, Carlton Street, St. Helens, and be received by him not later than 9th October, in an envelope endorsed "Power Station Superintendent."

The successful candidate will be required to pass a Medical Examination and contribute to the Council's Superannuation Fund.

P. BREGAZZI,
Borough Electrical Engineer.

Electricity Works,
Carlton Street,
St. Helens, Lancs.
16th September, 1944. 688

METROPOLITAN BOROUGH OF FULHAM

Electricity Department

Charge Engineer

APPLICATIONS are invited for the position of Charge Engineer at the Fulham Base Load Station. Applications will be considered only from persons who:—

(a) are under 40 years of age;
(b) have had sound technical education and training;
(c) have previous experience in the operation of modern electrical plant associated with grid supplies employing high pressure and high superheat temperature;
(d) have experience in load control and despatch.

The position is in Class L, Grade 8, of the National Joint Board Schedule, with a commencing salary of £555 9s. per annum, subject to superannuation deduction.

The Fulham Station is a base load station, the ultimate designed capacity being 310,000 kW.

Further particulars and form of application will be forwarded on receipt of stamped addressed foolscap envelope.

Applications, endorsed "Charge Engineer," must be received not later than noon on Monday, 16th October, 1944.

WILFRED TOWNEND,
Town Clerk.

Town Hall,
Fulham, S.W.6. 707

BIRMINGHAM CENTRAL TECHNICAL COLLEGE

Suffolk Street, Birmingham, 1
(Principal, Dr. D. S. Anderson)

Department of Electrical Engineering

APPLICATIONS invited for post of Assistant Head of Department, £450-£20-£600, plus war bonus £52. Candidates should have honours degree or equivalent, good teaching and industrial experience, preferably on heavy current side. Form of application and particulars of appointment obtainable from Principal on receipt of stamped addressed foolscap envelope.

P. D. INNES, Chief Education Officer.
648

APPLICATIONS are invited by the British Electrical Development Association for the appointment of an Area Officer. Applicants should be not more than 45 years of age. The person appointed will require to have a good knowledge of the electrical industry; experience in a commercial department of an electricity supply undertaking will be an advantage. The post is subject to the Association's superannuation scheme. Applications, stating age, qualifications, experience and salary required, to be sent to The Asst. Director and Secretary, The British Electrical Development Association, 2, Savoy Hill, London, W.C.2. 705

APPLICATIONS are invited from persons with suitable experience for the following appointment with an electricity supply undertaking on the S.E. coast: Superintendent of Contracting Dept. The successful candidate will be required to deal with the repair and maintenance of domestic apparatus, interview consumers, quote for installations, and generally be responsible for the administration of the dept. The appointment will be temporary in the first instance, but there are good prospects of permanency for the right person. Full particulars should be given of education, previous experience and salary required. Reply—Box 696, c/o The Electrical Review.

ASSISTANT Plant Engineer urgently required in the Midlands. Graduate in chemical or electrical engineering, with experience in design, installation and operation of chemical engineering plant, including small electric furnaces. Excellent post-war prospects. Salary from £600, according to qualifications and experience. Applicants should write, quoting C.2222XA, to the Ministry of Labour and National Service, Room 432, Alexandra House, Kingsway, London, W.C.2, for the necessary forms, which should be returned completed on or before 9th October, 1944. 677

BOOKKEEPER-Typist, knowledge of the trade, for contractors' office. Permanent. All details to—Bilton Smith Ltd., Acton, W.3. 6293

CHARGE Engineer required for Power Station in India. Experience with large watertube boilers and steam turbines essential. Salary, Rupees 800 per month, with free quarters and passage. Apply—Box 704, c/o The Electrical Review.

CHEMIST required for manufacture of and research into fluorescent material. Experience in this field or in inorganic analysis of traces an advantage. Excellent post-war prospects. Write—Box C.L.7, c/o 5, New Bridge Street, London, E.C.4. 674

COMMERCIAL Manager required for illuminating engineering department of progressive, well-established organisation. First-class experience in electrical fittings essential. Excellent opportunity for capable and energetic man. Present staff already advised. Write in confidence, with full details of experience, age and salary required, to—Box C.D.9, c/o 5, New Bridge St., London, E.C.4. 676

ELECTRICAL Engineer with practical experience in the manufacture of electrical accessories required in a permanent, part-time advisory capacity by small, progressive manufacturer. Our staff are aware of this advertisement, and strictest confidence in every way will be observed. Write fully to—Box 654, c/o The Electrical Review.

EXPANDING wholesale electrical company has vacancies for experienced Representatives with cars in London, the Midlands and South West England. Write—Box 4251, Collins Advertising, 26, Mortimer St., W.1. 6278

LEADING E.I.M.A. firm (London area) requires Chief Designer for the complete development of all classes of scientifically designed lighting apparatus. Applications, which will be treated in strict confidence, should be made only by those who have had an extensive experience in the design of industrial and commercial lighting fittings.—Box 6284, c/o The Electrical Review.

LEADING firm of electrical manufacturers has a number of vacancies for post-war Sales Representatives. Sound technical education with works and drawing office training essential. Experience in the installation and maintenance of distribution equipment an advantage. Applications will be considered now. Reply, giving particulars of age, education, training and experience, to—Box 15, c/o The Electrical Review.

LECTURER in Engineering in West Africa required for one tour of twelve to twenty-four months' residential service in first instance with possible permanency. Salary up to £1,000 per annum, according to qualifications and experience, or with increments if a lower commencing salary is paid. Free passages and quarters. Candidates should possess an honours degree in engineering and should be Associate Members of the Institutions of Civil, Mechanical or Electrical Engineers. Applicants should write, quoting E.836A, to the Ministry of Labour and National Service, Room 432, Alexandra House, Kingsway, London, W.C.2, for the necessary forms, which should be returned completed on or before 15th October, 1944. 687

MANUFACTURERS of radio and electrical components of highest reputation require a young man to consolidate and extend existing connections and to organise Sales Department. Only applicants with experience, technical background and knowledge of markets will be considered. Permanent progressive post with adequate remuneration for a capable and energetic man.—Box 690, c/o The Electrical Review.

PHYSICIST required for research on discharge lamps and associated problems. Research experience and knowledge of vacuum technique desirable. Excellent post-war prospects. Write—Box C.G.3, c/o 5, New Bridge Street, London, E.C.4. 673

PRODUCTION Supervisor required for lamp factory extension. Experience in discharge lamp or other lamp production preferred. Excellent post-war prospects. Write—Box C.R.3, c/o 5, New Bridge Street, London, E.C.4. 675

REPRESENTATIVE for North and North-west London, with knowledge of domestic and industrial wiring supplies.—Wm. Pryor & Co. Ltd., Electrical Wholesalers, 3, Kingsland High St., Dalston Junction, London, E.8. 646

REQUIRED for progressive post, Technical Assistant for Laboratory attached to engineering firm, N.W. London district. Knowledge of electrical and mechanical engineering, and knowledge of building construction would likewise be an asset. Salary from £400 to £500 per annum according to qualifications and experience. Applicants should write, quoting C.2278XA, to the Ministry of Labour and National Service, Room 432, Alexandra House, Kingsway, London, W.C.2, for the necessary forms, which should be returned completed on or before 2nd October, 1944. 637

SALES Estimators and Representatives. Permanent progressive positions for adaptable men. Some knowledge of power application of A.C. and D.C. motors desirable. Apply—Higgs Motors, Birmingham, 6. 686

STOREKEEPER wanted by a City firm of electrical contractors. Suitable opportunity for ex-service man. Write, stating age, experience and salary required, to—Box 6282, c/o The Electrical Review.

TRAVELLER required for Leeds and area covering approximately 15 miles radius, E.I.M.A. manufacturer. State connections, references, salary required.—Box 663, c/o The Electrical Review.

TRAVELLERS, Commission Agents are required throughout the U.K. by wholesale house to market industrial and other electrical articles, also large range of electrical fancy goods. Connections essential with industrial organisations, large turnover. Good commission basis only. Write to Box T, c/o Pethicks, 30, Bouverie St., E.C.4. 692

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