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A Good Day's Work

In the nearly completed twenty-five years of its existence, the Electrical Development Association has rendered invaluable service to the electrical industry. Time may prove, however, that the best day's work it has ever done was accomplished last Friday, through the instrumentality of the President, Lord Brabazon of Tara. Speaking at the annual luncheon, he conveyed a warning in very plain terms to Major Lloyd George of the evil consequences that would follow persistence in the proposal to set up a National Fuel Advisory Council. This monstrosity, conceived in the bowels of the Ministry of Fuel and Power, he hoped would be still-born. If it was not, and an attempt was made to direct users as to the particular fuels they must use for specific purposes post-war, then the troubles that the Minister was experiencing with coal would be as nothing to the electrical storm he would raise. The whole electrical industry would be united against him, and, backed by the millions of British housewives, Major Lloyd George would not know what had hit him.

Freedom of Choice Jeopardised

These were strong words, but not one whit more so than the circumstances justify. The National Fuel Advisory Council scheme is precisely the type of "scheme" we feared when a Ministry of Fuel was originally mooted; as readers will recall, we always regarded the proposal with suspicion. The ultimate evil inherent in a National Fuel Advisory Council is that under the guise of regulating the activities of the fuel industries, users would be constrained, willy-nilly, to adopt particular fuels for particular purposes, because preferable alternatives could easily be regulated out of economic competition. Superficially, consumers' freedom of choice might be retained; practically it would be non-existent. Frankly, what threatens from "national regulation" of "competition" between

electricity, gas and solid fuel is that housewives, who are expectantly looking forward to electrical emancipation from domestic drudgery, will be thwarted of their hopes. If that appears in prospect, then when beauracracy is arraigned before public opinion after the war, the Minister of Fuel and Power will assuredly be faced with the question—Is your Ministry really necessary?

The Above-Standard Voltages

We welcome the contribution of Mr. E. P. Burdett, on page 336 this week because, while we are on the side of those who consider a standard system of supply and a standard voltage would be nationally advantageous, we are not obsessed with the view that this should be rigidly enforced within a limited time and regardless of all conditions and consequences. Rather it is a desirable objective to work towards progressively, and as speedily as may be. Mr. Burdett's concern is with the above-standard voltage systems. If those supplying at 240 V are compelled to reduce their pressure to 230 V, some 8% of the capacity of the distribution networks would be lost; for 250 V systems the figure would be about 15%. The aggregate cost of these reductions in terms of capital investment sacrificed is placed at about £3½ million, or £2 per consumer. These are our contributor's estimates; he is at a loss to discover any compensating advantages.

Lesson of Frequency Changeover

The case for a national supply system and voltage does not, of course, rest on possible or problematical benefits to supply undertakings. Its two main supports are the promise of manufacturing economies when the existing multiplicity of ranges and types of appliances due to supply system variables is eliminated, and the benefits to consumers of interchangeability throughout the country. Without debating the pros and cons, however, there is the

object lesson of frequency changeover fresh in memory. Frequency standardisation was at first objected to vigorously by some affected undertakings, as being neither technically nor commercially justified. But in our issue, November 4 last, reviewing the establishment of "Uniformity of Periodicity," at a cost to the C.E.B. of £16 million, Mr. V. Watlington stated:

"... standardisation of frequency has very greatly contributed to the modernisation and efficiency of electricity supply and its innumerable applications."

Who is in a better position than Mr. Watlington to testify to the "invisible" advantages that resulted from frequency standardisation?

A Case for Special Consideration

General consideration as to the worthwhileness of standardisation in the national interest does not, however, solve the particular problem Mr. Burdett raises—the case of undertakings that have developed on more economical pressures than the standard, and are faced with a step-down change with no compensating local benefits. The I.E.E. Electricity Supply, Distribution and Installation Committee's Report gives the pre-war number of a.c. consumers above standard voltage as 1,712,000, or 21% of the total. That seems too large a fraction to leave out of any general scheme of standardisation that may be adopted. Rather, therefore, a solution of the above-standard voltage problem must be sought in other directions. The difficulty might be partially met by extension of time for changeover—allowing the system to "grow" by retrogression to the standard pressure. Also some cash compensation to the undertakings over and above payment of the cost of changing over consumers' apparatus and appliances to standard pressure might be justified.

Britain in the Lead

In the years immediately preceding September, 1939, Great Britain was leading the world by a clear margin in several branches of electrical engineering. Broadcast television and fluorescent street lighting are examples that are familiar, even to the general public; also radiolocation, although the advanced state of development of that art, for

reasons of military security, was not revealed until after the Battle of Britain. During the years of war it may appear that other countries, notably the U.S.A., have usurped Britain's leading position. Do not believe that. Behind the camouflage screen of censorship very striking progress has been made in many directions, of which only a hint is given now and again—as that colour television with sound recording may be available to some 80% of homes in Great Britain early in the coming peace years. Similarly, the war-time technical improvement in radiolocation, and so the scope of its peace-time applications, has progressed in the last four and a half years to a degree that would have occupied a decade or two under normal conditions. We confidently affirm, Britain's scientists and electrical engineers still lead.

Circular Fluorescent Lamps

Well-founded enthusiasm for British electrical prestige has led us rather astray from the specific matter concerning which we took up our pen to comment. This is the present position of tubular fluorescent lamps in this country and in the U.S.A. Here the 5 ft. 80 W tube is the solitary standard type at the moment, due, of course, to exclusive concentration on war-production requirements. Across the Atlantic, before the Pearl Harbour incident, a comprehensive range of sizes and models of fluorescent tubes had been evolved; METEOR referred in these columns some time ago to the existence of 15 W fluorescent type desk lamps. Now, we learn, from an advertisement announcement of the American G.E.C., that circular fluorescent lamps are promised after the war. Three sizes are projected, 20, 30 and 40 W, the bulbs having respective overall diameters of approximately $8\frac{1}{2}$, $12\frac{1}{4}$ and 16 in. Although these dimensions may suggest that the lamps will be "ugly big," that is probably only an initial disability, if a defect at all. For commercial and public building lighting, fluorescent globes of low intrinsic surface brilliance present new lighting possibilities. Parallel developments are to be expected here, of course, once our manufacturers are again free to concentrate on civilian requirements.

Distribution and Ownership

The outcome of the I.M.E.A. extraordinary general meeting last Thursday was that the Joint Memorandum (White) was referred back for certain modifications to Part III; the I.M.E.A. independent Ownership Report (Brown) was accepted. For those who hope to see Joint Recommendations on distribution re-organisation submitted to the Minister of Fuel and Power, the reference back of the White report is a disappointment. It means further delay if nothing else; but democracy must be served. Though the details of the criticisms of Part III of the Joint Memorandum have not been made known, there is no reason to assume, until the contrary is proved, that agreement will not be achieved ultimately.

Research Workers : Quality First

A number of speakers recently, when urging the importance of scientific and industrial research to our future prosperity, have depicted a rather gloomy prospect. Other nations, such as U.S.A. and U.S.S.R., it has been emphasised, spend many times as much money annually on research as does Great Britain, and the number of their scientific workers exceeds ours several times; moreover the gap is progressively widening. These contrasts are not to be denied, and the need is plain for more personnel and more money to be devoted to the discovery of new knowledge and its translation into practical utility if our industries are to continue to hold their own in face of growing world competition. Nevertheless, it seems, there is no occasion to paint the future in too gloomy tones. In comparison with the speakers referred to above, Dr. A. P. M. Fleming, when addressing the Manchester Chamber of Commerce last Thursday, was reassuring. "Our present position," he was sure, "is not at present anything like so unsatisfactory as the alarmists indicate. We can," he was certain, "hold our own at all times as regards the quality of our research, but our numbers of research workers are far too small."

But Numbers also Important

Coming from Dr. Fleming, with his long and intimate contacts with research work here and abroad, these words are encouraging indeed. Quality we have, and even the discrepancy in numbers is

in part only relative. According to Sir Lawrence Bragg, the production of first-class physicists is about one per million of the population, a ratio that probably does not vary much in any country. On this basis, the numbers of research workers in Great Britain, U.S.A. and U.S.S.R. might be expected to be proportionately 1 : 3 : 5. The only factor, said Dr. Fleming, that would bring about a change in the ratio would be encouragement at an early age of young people to become research workers, and the efficiency of their subsequent education and training. Therein, if we mistake not, lies the principal lesson it was his purpose to emphasise. A factor that has tended to restrict the application of research to industry in the past is that we are essentially a nation of small manufacturing concerns; 98% of our factories employ less than 1,000 workers. The solution of this difficulty, it was suggested, would be for each small company to have at least one technically-trained officer able to translate and to make effective all the appropriate new knowledge provided.

C.E.B. Entertainments Section

Many years ago we received a load curve from Mr. W. H. Wheadon showing the jump in demand that occurred on the Adelaide network in the early hours of the morning when an England *v.* Australian Test Match was being fought out. Australian cricket fans switched on lamps, heaters and food warmers, as well as their radio sets, when listening to the running commentary. This phenomenon of the response of the load demand to a popular broadcast is nowadays quite familiar. As Mr. Clinch indicated at the I.E.E. last week, the effect on occasion calls for appropriate action at the C.E.B. control station. Which gives birth to an idea. Why not a C.E.B. Entertainment Section, operating through rediffusion over the national supply network? Assorted items of Itma, Chamber Music, Hi! Gang and the Modern Poets, interspersed perhaps with staff talent, would place in the hands of the central control engineer a new mechanism for smoothing out the irregularities of the load curve. There are obviously great possibilities in this unexplored technique. Who knows, for instance, what a bagpipe solo by Sir Archibald might not do to the peak in emergency?

METEOR

THE ABOVE-STANDARD VOLTAGES

Consequences of Reduction to Standard

By E. P. Burdett

THE spate of post-war optimism runs ever faster. Anyone foolhardy enough to try to stem the flood must meet the proper fate of the obstructionist. Yet a feeble outcry here and there may be not wholly without merit, as a reminder of the existence of an inarticulate and bewildered minority.

The usual opening of the electricity planner is:

"It is universally recognised that the chaotic condition of the electricity supply industry can no longer be tolerated."

This statement has been made so often that it has become an axiom, and no details of the chaos are given or required. Few even trouble to describe the improvements which their proffered remedy will effect. It is enough that it will make a change; for in so decadent an industry any change must be for the better.

I.E.E. Committee Recommendations.—The Report of the Post-War Planning Committee of the I.E.E.* lies, of course, in quite another category. The report is drawn up, not by politicians or the grinders of axes, but by eminent and unbiased engineers. Here, at least, we should expect to find a reasoned examination of the evils which exist and of the benefits which the plan will confer. Before recommending the standardisation of voltage as "an immediately urgent post-war problem," the I.E.E. Committee undoubtedly made an exhaustive research into the reductions to be effected in the cost of manufacturing lamps, cookers and other equipment for a single voltage, and into the economics of moving house, and then compared the result with the expense of standardisation. But the report is unduly condensed, for this is all it says:

"The adoption of 4-wire 3-phase 400/230 V at 50 c/s as the standard for low-voltage distribution in Great Britain is now accepted by those concerned, and there is general agreement that it would be in the interest of the electricity supply industry and the consumers if its use could be extended throughout the country. . . ."

"The desirability of voltage and system standardisation as a matter of public policy is now universally accepted. . . ."

The cost of changing the 240 V and 250 V supplies to 230 V is given as £0.57 per consumer and £4.75 per consumer respectively, these figures apparently representing the cost

of changing consumers' apparatus. The important effect on the distribution systems of these unfortunate undertakings is not, however, overlooked. The report says:

"The reduction of above-standard voltages to standard would cause some loss of distribution capacity, but this would be more than compensated for by the increase in capacity of existing systems now operating at below-standard voltages. Taking the country as a whole, the gain in capacity of systems now operating at voltages below standard would be rather more than double the loss in capacity of systems now operating above standard. Allowance for this factor has not been made in the estimates of cost of voltage standardisation."

Specific v. Average Effects.—The statement is true enough, although the time element is obscured by comparing an immediate loss with a problematical gain. But the effect is a little unfeeling. Let us try it again with a different theme. "It is universally agreed that the size of collars must immediately be standardised, in the interests of the collar-makers, the haberdashers and the public. It is true that seventeen-inch necks will suffer some discomfort, and eighteen-inch necks be mildly strangled, but these troubles will be more than outweighed by the additional room for growth afforded smaller necks."

Procrustes invented post-war standardisation many years ago. This bandit chief liked to feel that his bed was exactly the right length for all his guests. If any visitor was too short, he was stretched on a special machine. If too long, his feet were cut off. The spoils of those who unfortunately perished during adjustment went to Procrustes.

As stated in the report, the standardisation of 230 V dates from 1925. The crime of the non-standard undertakings is largely that of being too early on the scene. In 1907 the Engineering Standards Committee recommended a standard low pressure of 220 V, while in 1921 the standard voltages were specified as 220 V d.c. and 240 V a.c.

Loss of System Capacity.—Capacity being normally limited by voltage drop, the change-over from 240 V to standard would result in the loss of 8% of the capacity of the distribution cables. The changeover from 250 V would cause a loss of 15%. In a typical undertaking, the value of the low voltage mains might amount to £18 per consumer. On this basis, the cost of reducing to standard voltage the distribution systems of 240 V and 250 V undertakings would be £3½ millions, or £2 per consumer.

* See THE ELECTRICAL TIMES, Feb. 3, 1944, p. 132.

It would not, however, be possible to add exactly 8% or 15% to the capacity of all the distribution mains, many of which are fully loaded. Difficulties would be especially marked in the rural areas. In practice, an extensive system of new cables and substations would have to be provided at a cost much above the theoretical figure. If all or part of the expense of the changeover were met by subsidy, one can imagine arguments on betterment extending over a generation.

Adverse Effects on Transmission.—Apart from losing distribution efficiency, the undertakings would have to take steps to obtain the reduced voltage. The primary voltage could be lowered, thereby degrading by 8% or 15% the whole of the transmission system as well as the distribution. Alternatively, every transformer with 415 V or 440 V secondary winding could be scrapped or re-wound, assuming the tapping range to be insufficiently wide to give adequate regula-

tion at the lower voltage. Probably the latter course would be less costly in the long run. Another method, perhaps the most promising, is the installation at every sub-station of auto-transformers in the low voltage busbars.

In Conclusion.—It is easily assumed that the end of the war will find us with money and material beyond our essential needs. Will it not be wise to make sure that this condition is realised before we decide to squander a substantial part of the distribution systems of our undertakings with above-standard voltages? If the standardisation of voltage is considered solely from the standpoints of the nation and the consumer, the proper voltage to adopt is 250 V. An increase of voltage improves the whole system of electricity supply, from the transmission mains to the consumer's wiring installation. A decreased voltage is a dead loss.

E.D.A.: A CLARION CALL

THE attendance at the annual luncheon of the Electrical Development Association, on Friday, presided over by Lord Brabazon of Tara, was one of the largest in its history. Great enthusiasm was aroused by the stirring speech of the President, and his humorous digs at the powers that be were much appreciated.

The Rt. Hon. W. S. Morrison (Minister of Town and Country Planning), in submitting the toast of the Association, said that when it was started 25 years ago there were under

750,000 consumers of electricity in the country, and 20 years later there were 10½ million. The Association and the war together had made them all electrically minded, and at the end of the war there would be a much higher proportion of the population than ever before understanding something about the practical control

and alive to the still unrealised possibilities of the commodity whose marketing it was their business to promote. It was not only their business, but the business of all who wanted to see the country rapidly and

wisely developed. Two points occurred to him in which the industry of electricity supply had notably helped the planner already and promised to help him increasingly in the future. In so far as electricity enabled people and industries to be more mobile—to have a wider choice of habitation—it made the task of the planner easier. Again, in as far as electricity supply enabled people in the country to enjoy such advantages as the telephone or the wireless, including, he hoped before long, television, it added richness and variety to the countryman's life, and so counter-balanced some of the temptations which in the past had drawn him to the town. In so far as electricity could bring light and heat in a clean and convenient form to the countryman it could make

his life and still more the life of his women-folk nearer to what they would all wish to see. He saw a great future for the electrically-driven pump in rural districts as a factor of the first importance in the countryman's water supplies, whilst electricity held out high hopes for the development of truly rural industries. The creation of the



Lord Brabazon, President.



Mr. C. Parker, New Chairman.

Ministry of Town and Country Planning and the Interim Development Act which Parliament had passed had caused some anxiety in certain quarters of the electrical industry. The decision that the future use of the land should be a planned use meant some change in outlook and some changes in organisation. They would have to experiment a bit with the working of the modified machinery. But he had had opportunities of discussing these changes with leaders of their industry, and he saw no reason why given common sense and good will, they should hamper electrical enterprise in any way. On the contrary, he ventured to prophesy that in the long run they would powerfully promote it.

The President, in reply, having referred to the manner in which the electrical industry had stood up to enemy attack, said that one like Mr. Morrison, who had spent a long time in the House of Commons, and seen much gas generated, must be impressed when looking around the assembly that day and realising that there was not one present who was not charged with electricity. Everyone outside was charged for electricity. They were sitting there in series and their voltage was enormous, and he told them quite frankly that no ohms of the Government could resist the potential of that room. They always had a suspicion about the Government that it was going to resist everything, and how could they think anything else when they received the blue envelopes, marked "O.H.M.S." and containing matters regarding the development of electricity. He agreed that education was wanted in some respects. Why they had to stand on their heads to put a power plug in he had never been able to understand. But more and more electricity was becoming essential in the house, and in regard to that they had a tremendous ally in the women of the country. Women liked the electric iron, they could not do without the vacuum cleaner; every form of labour-saving device should be given them. They would like an electric clock and hot water and refrigerators, and a mains wireless, and they were going to enjoy television in the near future. They might even have electric rolling staircases and a "de-smugger." They had to remember that it was the job of the industry not only to keep pace with the times, but to be ahead of them. They talked about advertising, but at present they had the plea for fuel economy, which made their task a little difficult. They realised that there were some points on which they disagreed, but they must be careful of supporting a quarrel between man and wife because they were apt at any moment to turn their combined efforts upon one. Politicians would remember the old quarrels on the subject of tariff reform, but tariff reform had another mean-

ing within the narrow circles of the electrical industry. He had always had a tremendous affection for the Electricity Commission, partly due to that great gentleman, Sir John Snell, who once presided over it. They had, as his successor, Sir Cyril Hurcomb. The Commission had had a chequered life. It started with the Board of Trade and went to the Ministry of Transport. Then it was associated with the Ministry of Shipping, and was now under the cloak of the Ministry of Fuel and Power—at least he thought so. Poor Sir Cyril Hurcomb must wonder where he had to go when he wanted to see his Minister. Curiously he had never been inside the Ministry of Fuel and Power, but some of his friends had, and they told him that along some of the passages there was a distinct smell of gas. In these days of war they were always being lectured and spoken to by the Government. They were told one day that the country was winning and the next day that they had years of trouble ahead of them. They were always having lectures, until at the end they began to reflect. There were few opportunities for delivering a lecture at the Government, but this occasion was one of them, and he hoped that Mr. Morrison would convey to his colleagues what he was about to say. The Ministry of Fuel had set up a Fuel Efficiency Committee. Well, they thought that was doing good work, and they supported it, and would co-operate in conserving the fuel resources of the country in the best way possible, but there was being conceived in the bowels of the Ministry of Fuel and Power a monster, which they hoped would be still-born. What some people wanted the National Fuel Advisory Council to do was to regulate which particular form of power or light people should use. This frightful body wanted to tell people when they should use electricity and when they should use gas. He did ask the Minister of Fuel and Power to think again. Would Mr. Morrison tell his colleague that, much as they regretted his experiences in the coal industry, and however much they sympathised with him in his troubles and anxieties about coal, yet these would be as nothing compared with what he was running up against, if he went on with this proposal or tried to put a quick one across them in war-time. They might have their differences on some points, but on this particular one there would be a front such as they had never seen before in the electrical industry. Municipal bodies and power companies and manufacturers, and, what's more, the women of the country would rise in their might, and the Minister would not know what hit him. When he was a boy he was told that to play with fire was a dangerous thing. Let him point out now that there was no more perilous thing for the politician to do than to play with electricity.

ANNUAL MEETING

At the annual meeting which followed, Mr. E. E. Hoadley (chairman of the Council)



Mr. F. Newey, Vice-Chairman.

proposed the adoption of the annual accounts and said everyone of the members had agreed to pay full-scale subscription for the year.

Mr. Townley seconded the motion which was carried.

Mr. Hoadley moved the adoption of the annual report, which touched on the activities during the year, most of which

have been dealt with already in our columns. He referred to the renewed advertising, and said the Association had established a definite new technique in advertising electricity. He reviewed what had been done in regard to film production, and touching on his work as chairman for two years, paid a warm tribute to the support given him by his colleagues and by Mr. V. Dale, the chief executive officer. He trusted that all the members would work together to put the electrical industry in its rightful place. For a long time they had been told by Government departments what they had to do, and it was time they turned round and told some of the Government departments what they had to do.

Mr. C. Parker seconded the motion.

Mr. Logan raised the question of what could be done in regard to proposals for the installation of gas and solid fuel in post-war houses, and **Mr. Townley** hoped it would be possible to go further in regard to use of apparatus which would be available for such houses at the end of the war and which it would be possible to get later.

Mr. Hoadley said the Architects' Advisory Panel, set up in conjunction with Mrs. Gregory, had produced designs for different classes of houses, and full-sized models were being made. The matter raised by Mr. Logan was very near the heart of the Council.

Mr. Sumner pointed out the importance of electrical facilities being available in rural areas, and Mr. Hoadley said the matter was in the hands of the Farming and Agricultural Committee set up.

Lord Brabazon was re-elected president and **Mr. A. C. Bossom, M.P.**, elected a vice-president.

Alderman A. Critchley, M.P., moving a vote of thanks to the president, said he had

given them a lead which they should follow. They had in the President the Prime Minister of the industry.

Mr. H. J. Randall, in seconding, said the President had dropped a bomb on the Minister of Fuel's scarecrow.

A hearty vote of thanks was passed to Mr. Hoadley, on the motion of **Mr. C. Parker**, seconded by **Brigadier-General Legge**.

Mr. Hoadley said the policy he had tried to preach was that the industry was one, but Government people told them they had to go to four or five bodies and all the answers were different.

E.D.A. : N.W. ENGLAND AREA

The annual luncheon and meeting was held on March 9, at Manchester. Mr. J. E. Shepherd, retiring area chairman, presided. Mr. R. Nicholas, city surveyor of Manchester, proposed the "B.E.D.A." to which Mr. E. E. Hoadley, chairman of the B.E.D.A., replied. At the meeting, later, Mr. R. H. Harral, (Blackburn Corporation Electricity Department), was elected chairman, with Mr. W. H. Metcalfe (Bacup), as deputy chairman.

TRANSMISSION SECTION LUNCHEON

THERE was a full gathering, up to the limit allowed, at the annual informal luncheon of the I.E.E. Transmission Section. **Mr. T. R. Scott** was in the Chair, and after the toast of "The King," in accordance with custom, he called upon the President, **Col. Sir A. Stanley Angwin**, for a few words.

The President referred to the length of discussions at recent meetings. It was important that everybody who desired to take part should have an opportunity for doing so, yet at the same time he did not like to impose a time-limit. The Section had nearly 2,000 members, and the possibility might be considered of setting-up associated groups at the local centres. The Wireless Section had been most successful in this direction. He also drew attention to the value of written contributions to the discussion for publication in the *Journal*. It was of importance to get the maximum consensus of opinion on subjects before the Institution.

As Chairman of the senior I.E.E. Section, **Mr. T. E. Goldup** wished success to the Transmission Section. He mentioned that the Wireless Section was now entering its twenty-fifth year. They had found the formation of local groups most successful. However, there was a tendency to excessive specialisation, and to counteract this, more combined meetings and papers should be planned.

The health of the chairman was proposed by **Mr. E. W. Moss**, Chairman, Measurement Section.

POST-WAR ELECTRIC SERVICE

By a Supply Engineer

IN post-war years, drastic revision may be necessary in pre-war conceptions of electrical salesmanship. Those who have held the opinion that electricity supply and usage should be considered as a service rather than a commodity, in its legal sense, may find their perspective has proved correct. No longer will the average potential cooker or refrigerator user visit a supply authority's showroom to select an appliance and arrange for it to be installed. Advice will be required also on kitchen lay-outs, ventilation and other associated problems. Conversions of existing systems to electric water heating have always demanded specialised knowledge, visits to potential users' houses, etc.

Large Consumers.—In the commercial field, embracing heavy duty cooking, space and water heating, etc., much the same applies. In short, the future engineer dealing with such requirements must not only be thoroughly trained electrically, but also possess sound working knowledge of general and specialised conditions applying in any particular theatre of development. So far, only power development has been treated in this way—partly due, no doubt, to the technical and, to a lesser extent, practical knowledge required being part and parcel of an ordinary electrical engineer's training.

Looking into the future, it is important to consider where and how such specialists are to be obtained. In pre-war days there existed on the staff of the average supply authority a general factotum under the label of "Consumers' Engineer." Generally, he was responsible for routine work and enquiries, showrooms, sales and demonstration staff, etc., and also for the efficient handling of the more unusual types of enquiry, quite irrespective of from what specialised field these emanated. When difficulties arose, the good offices of the E.D.A. specialists, or those of manufacturers, were invariably solicited, or experience gained on a trial and error basis. In many instances no genuine enthusiasm was displayed, especially in the large-scale space-heating field, and much potential business was lost.

The Future.—In view of the vast post-war potentialities, it is questionable whether a continuation of such a system will meet the requirements. Certainly suitable men will not be attracted to such specialised vocations, requiring not only electrical training, but also considerable commercial and specialised knowledge, unless the scale

of remuneration is improved. In the future some reorientation of ideas will certainly be necessary on the part of many supply authorities regarding the value and necessity for such specialists. Loads like large-scale cooking, space and water heating, will not be efficiently developed on their own accord, or as a side line. The potential load is very considerable, and suitable technical and practical training schemes will have to be initiated sooner or later, and such work viewed in its correct perspective.

In pre-war days some large supply authorities, chiefly privately owned, appreciated the necessity for such specialised services, and legislated accordingly. On the other hand, it could be argued with a good deal of truth on behalf of smaller undertakings that the potentialities did not justify the retention of specialists. This may have been the position in the past, but certainly will not apply in the future; moreover, from this viewpoint, does not the desirability for a reduction in the numbers of supply authorities into more economic units on an area basis clearly emerge? Any large industrial area should have its own electric industrial power and heating specialist; a large holiday resort, its large scale cooking specialist; an agricultural area, an engineer thoroughly conversant with the applications of electricity in agriculture. Public lighting will no doubt be "nationalised," but, in view of the advent of fluorescent lighting, specialist extension in the lighting field should not be forgotten.

Technical Education.—Common identity has recently been established between certain parts of the examinations held by the Institutions of Electrical and Civil Engineers. This is a step in the right direction, and aims at "generalising" the theoretical training of engineers on subjects where they meet on common ground. Some extension of this idea may become advisable in the future, so far as it applies to specialised uses of electricity, the respective professional bodies realising that where there exists some interconnection in practice between one science and another, then the specialised sections of their examinations should be, to some extent, inter-related, and not independent, as at present. Catering for a slightly different field, the E.D.A. and E.A.W. might also extend the scope of their examinations to embrace specialised branches other than domestic load development.

SUPPLY UNDERTAKING RECORDS

HAVING recently given consideration to the question of design of a single form capable of being utilised as (1) a record of accountancy data, (2) a works order, (3) record of technical information, and (4) advice of completion, I was naturally interested in the article which appeared under the above heading in a recent number of THE ELECTRICAL TIMES, and I therefore enclose a copy of a form which would fulfil all the above functions. I am in agreement with Mr. F. O. Harber as to the desirability of standardisation, although in designing this form, that

question had not been considered. It will be noted that this form covers only details of data appertaining to electricity supply, as it is considered that contracting and credit sales should be dealt with separately.

This form could be used by a centralised or decentralised organisation, and simply by varying the number of copies, can be used where the work is carried out by one manual worker, or several, where testing and meter fixing is carried out by different departments. It is equally applicable to new services, re-connections or extensions.

A few explanatory notes on the various headings may be helpful. It will be noted a "Works Order No." is shown; the Works Order No. is necessary to identify the various jobs which may be carried out at the premises covered by any one consumer's number, which, of course, will not be altered by extensions, etc.

"No. of Distribution."—This gives clerks immediate indication as to which distribution the service is connected, which information is necessary for the accurate statistical recording of premises and appliances connected.

"New meter card prepared" is of course for accounts department notification.

"Entered in Log Book."—When completed this provides proof that statistical information extracted from the application form has been recorded.

"Date P.O., Gas, Water and Local Authority advised" shows the foreman at a glance when he can proceed.

"Service Cable laid or erected" and "Service Test."—Details would be inserted by jointer or linesman.

The necessity of completing "Certification that clearance of O/H lines complies with O/H line regulations," ensures that this important point is not overlooked by linesman.

"Date supply connected."—This is extremely important in the case of T.P.T. consumers, as service and even meter, may be fixed some considerable time before supply is made available to the consumer.

Special mention of sub-meters is desirable, as otherwise consumption recorded by sub-meters is liable to be charged without corresponding deduction from main meter.

After completion of the job, the information given on the various copies of works order is collated on one order, which is signed by the manager and filed away with the supply agreement—a complete record.

A. G. PARSONS, A.M.I.E.E.

District No. Date Works Order No.
 Consumer's Name and Address Consumer's No.
 P.C.A. File No. of Distribution
 Amount of Deposit Carry out the following work :—
 Amount of Fixed Charge New Service U/G or O/H.
 Floor Area Re-connection } of Consumer's
 Tariff Extension } No.
 Amount consumer has agreed to } Tapping from Consumer No.
 pay towards cost of service. } Name and Address
 New Meter Card prepared or } Lay
 existing one amended (Initial) } Erect
 Entered in } Install meter amp.
 P.C.A. Log Book (Initial) } " " " "
 Date P.O. advised " " " "
 " Gas Co. " or
 " Water Co. "
 " Local Authority Advised Signed Manager.

SERVICE CABLE laid or erected.
 Size Class Length yds. No. of Cores
 " " " " " " " "
 " " " " " " " "
 If Underground Cable
 Highway yds.
 Private
 property "

Position of Joint :—From centre of premises L or R From Kerb

SERVICE TEST
 Between Megs. To Earth Megs.
 Polarity of Phase. Lighting Heating and Cooking Power
 Certified that clearance of O/H Service Line
 complies with O/H Line Regulations
 Date completed Jointer's or Linesman's Signature
 Entered on Mains Dept. Records by

WIRING TEST
 Lighting. Between Megs. To Earth Megs.
 Heating. Between " To Earth "
 Power. Between " To Earth "
 Date tested Tester's Signature
 Date supply connected By

METERS	INSTALLED			
	Lighting	Heating	Cooking	Power
Maker				
Maker's No.				
Size				
Reading				
Weekly Charge				
Unit Rate				
M.D.I. Reading				
Coin Register				
" Unused				
Cash taken from meter				
Meter No. is Sub to Meter No.				
Job completed Signed Manager. Date				

ANALYSING SUPPLY SYSTEM LOADS

WITH the greatly increased attention which will be given to distribution and service problems in the post-war period, the paper read at the I.E.E. last Thursday by **Mr. P. Schiller**, of E.R.A., on "An Analysis of the Load on a Modern Electricity Supply System," is of special interest.

The paper contains an analysis of the load on the system of the Northmet Power Co. for the year ended June 30, 1939, i.e., the last two consecutive half-years before the outbreak of the war. During the period under consideration, the area supplied covered 650 sq. miles, chiefly suburban, with a population of 1.2 million. The collective maximum demand during the period under consideration was of the order of 300 MW. Owing to its size, the Author said that the system may be considered representative of average suburban conditions in Greater London.

The principal results of the analysis are given in two diagrams and one table. By way of comparison, the Author gives kWh consumption values for the whole country. The results show that although the cooker saturation on the Northmet system for the period in question was rather below the national average (usually assumed to be of the order of 15%), the kWh sold per domestic consumer exceeded the corresponding value by about one-third. The explanation seems to lie in the comparatively higher level of income, and the more extensive application of space heating. Domestic sales accounted for about 44% of the total, the national average being of the order of 25%.

In his conclusions, the Author stated that if there had been no lighting or space heating load, the collective load factor would have been around 56%. The addition of the lighting load lowered this to 44% and the further addition of the space heating load resulted in an actual value of 33½% (39½% excluding the cold snap which occurred in the second half of December). The load factor of the space-heating load seemed to be lower than that of the lighting load. The daily load curve of the space heating load produced by a cold day showed two virtually equal peaks, one between 8 and 9 a.m.; and the other between 10 and 11 p.m. It was the morning peak that might give rise to alarm. With the cooker saturation at 11% the mid-day cooking peak was still well absorbed by the lunch-time dip in the factory load.

After indicating other features of the analysis the Author suggested a number of directions in which further work should be carried out. In the analysis as described in the paper, the block of annual load is split up into a basic, or all-the-year round portion, and a seasonal portion, the latter representing all the consumption due to space-heating

and about half that due to lighting. The basic portion is sub-divided into its principal components and, as regards the seasonal portion, an attempt is made to separate lighting load and space-heating load, both as to demand and annual consumption. For this purpose, "seasonal demand curves" are developed in which the load at a certain time of day is plotted for a series of days and compared with the simultaneous conditions of outdoor temperature and illumination.

DISCUSSION

Mr. W. N. C. Clinch (Northmet Power Co.) remarked that the information contained in the paper related to pre-war conditions and whether they would apply after the war he could not say. He felt that in several respects the hypothesis was somewhat questionable. For instance, reference was made to the higher level of income in the area dealt with, but it was very difficult for a technical expert to prophesy too far what was a level of income. What the Author probably meant was a higher level of revenue. On the question of seasonal supply, he said it was difficult always to relate temperature alone to the demand for space heating. Account must be taken of the relative humidity and also the psychological factor. As to the effect of wireless reception, the C.E.B. had noted the peculiar effect on its load due to a particular artist who came on at a particular time. There was to-day fairly good evidence that wireless reception made a definite impression on the load curve. The Author assumed that the cooker load took place at the same time as the falling industrial load, but that was not the fact, and it could be demonstrated.

Mr. D. J. Bolton (Regent Street Polytechnic) said the deductions made from the Author's method rested upon one or two rather important assumptions, and in particular the assumption of what was called the basic load. One interpretation of this was that it was entirely due to certain particular loads which carried on throughout the year at a constant value. Another equally valid interpretation would be that it was made up, in part, of two or more complementary loads, each of which would produce a certain amount of so-called basic effect. By the Author's method there was no means of distinguishing one from the other.

Mr. C. J. O. Garrard (G.E.C.) pointed out that future possible development of electricity supply would render it necessary to know a great deal about loads and the way they varied. It would be interesting to know if the gas industry was doing anything with regard to availability of data on consumption. One of the most interesting parts

of the paper was where the Author foreshadowed some difficulties if load development was not based on accurate knowledge. Space heating, from the supply authority's point of view, had in the past been very lucrative, but the Author had shown that in the particular year investigated there was a cold snap, and while it only increased the units sold by about 1%, the maximum demand went up by 18%.

Mr. J. I. Bernard (E.D.A.) said he felt the risk was being run of dealing with too much detail and pushing conclusions a little farther than was justified. If this paper had been confined to a clear exposition of the methods that could be adopted in an analysis of load curves, it would have been more helpful to those who might wish to make such an analysis. If such a presentation of methods of analysis had pointed out the possible margins of error in the different steps, it would have been more valuable. Some of the conclusions in the paper were a little sweeping. For instance, it was said that a striking feature was the insignificance of the water heating load, but there were only 15,000 water-heaters connected, and since they could only have a small maximum demand, that must necessarily mean a low figure for the whole.

Mr. G. O. McClean (Edmundsons) emphasised that this analysis applied to one particular undertaking only, and drew

attention to the danger of applying the results to the general case. He felt that the ordinary common or garden methods of comparing one, two or three chosen pairs of daily load curves would give comparable results. The Author's load model was out of date. The contour plan was much easier to draw and carry about than a solid model. He showed a slide illustrating the contour plan as applied to a system.

Mr. E. A. Logan (Electrical Engineer, Erith, T.C.) said the paper raised the question whether the space heating load was remunerative and seemed to suggest that it was not. As a supply engineer, however, he would hate to be parted from the space heating load, and felt that the apparent conclusion to be drawn from the matter was erroneous.

Mr. E. E. Jolly (Bethnal Green B.C.) said that as a supply engineer, the paper rather frightened him, especially in view of the possibilities of space heating after the war. With a suitable tariff he had great hopes for space-heating in post-war years.

The Author, in the course of his reply, said he had not taken into consideration all the factors concerning space-heating, because that would have been impossible. The method of analysis would be studied further, but it would be necessary for it to be tried out in practice by other engineers.

SIGNALLING ON LONDON RAILWAYS

THE railways of the London Passenger Transport Board now cover 160 miles of double track, and the passenger-train car-miles run annually amount to nearly 160 million. For signalling there are 3,281 stop signals, 2,726 of which are fitted with train stops. Track circuits amount to 4,347, and there are 1,326 pairs of points. The importance of signalling on such a vast system has led to a paper on the subject being read by **Mr. R. Dell** before the I.E.E. Measurement Section. It was entitled "Developments in Railway Signalling on London Transport."

Originally d.c. was used for track signalling, but although polarised relays were used, there was still some interference with stray currents. Now alternating current is employed throughout for all signalling circuits, as well as for the track circuits themselves. Electro-pneumatic operating gear is used. Two-aspect signalling is adopted, as the plain red for stop and green for go is much simpler. Special arrangements are made to prevent drivers seeing the red light unnecessarily. Thus, on straight runs, the light is only illuminated when the train is so close to the signal that the brakes have

to be applied. This avoids slowing down the train when some distance from the signal.

Track Circuits.—The fourth rail system is employed, and the Author showed that this is cheaper than a third rail system, where the number of track circuits per mile exceeds ten. The average for the Board's lines is 18 per mile. The track circuits are fed from a transformer through a condenser which effectively checks any stray d.c. flow. In cases where it is necessary to detect the exact position of a train, an 11 ft. length of rail is insulated and bridged across for the normal track circuit. A train standing on the isolated section can then be detected by suitable means.

The relays used are of a twin vane type, the vanes being mechanically interconnected, so that should one vane stick, the opposite movement will be locked. The vanes actuate two separate sets of contacts connected in series. The Board supplies current from its own power stations at $33\frac{1}{3}$ c/s, and this has the advantage that interference on the track circuits from stray currents of 50 c/s is less likely to cause false operation.

The Author then went on to discuss the

lay-out of signal cabins and relay rooms. Illuminated track diagrams are in general use. Although relay interlocking helps the signalman, it has the disadvantage that the circuit employed is more complicated than individual lever signalling. To overcome these difficulties, a system was evolved before the war consisting of a power-worked-lever remote-control system. The signals are operated by an interlocking frame at a central cabin. On the tube from Archway to East Finchley, automatic speed control is introduced because of the curve at the bottom of the down gradient. The speed of the train is measured by track circuits, and, if excessive, the signal remains at red, thus ensuring that the train is brought to a standstill.

DISCUSSION

Major L. H. Peter (Westinghouse Brake & Signal Co.) said that basically the system described in the paper was the same as that installed in 1904, although the apparatus and the circuits had developed very greatly. Many of the particular pieces of apparatus were peculiar to the requirements of the dense traffic of the system. With regard to the relative costs for third and fourth rail systems, the supply frequency should be stated as the cost of impedance bonds, which was the major item in the third rail traction system, was dependent upon that. The raising of the frequency of the signal supply for third rail traction might be of considerable advantage in the future.

Where one was considering an entirely new installation, the recent developments in coded track circuits would represent a large saving in cable and would provide the means of giving a signal in the cab and enforcing speed control without necessarily using the mechanical trip arm. One of the most striking features of the paper was the high degree of reliability of the equipment.

Mr. F. D. H. Page (Chief Signal Engineer, G.W. Rly.) said the necessity to prove that a signalling circuit performed its function in the way intended resulted in a degree of complication, so that every engineer must decide how far it was practicable and economical to go. The arguments as to a special frequency for signalling circuits and for two-core cables instead of multi-core cables were not such as to justify the enormously increased cost of adopting those features on the main line railways.

A great deal of controversy had centred around the merits of all-electric and electro-pneumatic operation. There was a great deal to be said for the latter so far as point operation was concerned. Mr. Page asked if the Author could give figures of the comparative costs of the two systems.

Mr. S. W. Melsom (C.M.A.), dealing with the Author's reference to the corrosion of lead or loss of lead from cables laid under-

ground, suggested that it was due to straightforward electrolysis. He regarded the burning of the lead sheaths of cables as being improbable. As to the need for screening signalling circuits, he said that the likelihood of faults occurring between cores was remote, and suggested that a multi-core cable without a copper screen would provide a much higher degree of safety than one with a copper screen. He hoped that before the Author floated his suggested screened cable on the world he would consult engineers who had a special knowledge of cable making.

Mr. E. G. Bretnall (L.N.E.R.), referring to the Author's view that electro-pneumatic installations were perhaps more simple than the all-electric, pointed out that there must be two sources of supply everywhere, and that might not always be economical. The main line companies had isolated places where power operation was required and it was not possible or economical to introduce electro-pneumatic operation. There was much to be said for multi-core cables, as well as for burying the cables, so long as they were buried in the proper places. Buried cables were out of the way, and in the case of a derailment they were not affected.

Mr. H. H. Dyer (L.M.S.) suggested that the trouble experienced with multi-core cables was probably due to the use of v.i.r. cable. The multi-core used by the L.M.S. Railway was oil-impregnated paper-insulated, and there was a very big factor of safety. Such cables had been in use for as long as 35 years, and had given no trouble whatever. The additional cost of the twin-cored cables was a very serious matter.

Mr. A. W. Woodbridge (G.W. Railway), referring to a diagram showing the total failures per unit for each year, said that no account was taken of the operations of those units, and presumably the same failures would occur if they were never used, instead of being used millions of times.

Mr. S. A. Stevens (Westinghouse Brake & Signal Co.), asked if the Author had considered a system in which the a.c. supply return, instead of being directly connected to earth, was joined to earth through a source of d.c. through a high resistance, so as to superimpose on the a.c. signal power system a small d.c. potential fed through a high resistance; then again in parallel with the a.c. supply return back to earth a voltage operated relay. So long as the insulation of the system as a whole was well maintained, the relay would remain energised and would give a good indication. If the insulation tended to become faulty, the relay would give warning. He suggested that a system of that kind, which would give an indication that a fault was developing, was more convenient than one which operated when a fault occurred.

Mr. Dell replied to the discussion at some length.

NORWICH ON THE RIGHT LINES

A FEW weeks ago we described the Consumers' Advice Bureau which has been set up by the Electricity Department of the Norwich Corporation, and now we have particulars of another piece of very valuable propaganda affording evidence of the determination of Mr. J. A. Summer (city electrical engineer) and his staff to keep the

prominent agriculturists have expressed keen interest in the showroom, and a suggestion has been made for a stall in the Cattle Market.

The New Showroom.—This is divided into a number of sections. That for dairy equipment comprises a sterilising chest, steaming jets for milking clusters, and a steam injector for heating water in a wash trough. There are two or three milk units of various types,



Display of Dairy Utensils.

advantages of electricity well to the fore in the large agricultural area covered by the department's activities. Everyone is, of course, aware of the great increase in the mechanisation of the farms of the country, but many have yet to learn of the ways in which electrical equipment can serve a vital part. Recognising this, those responsible for the management at Norwich are taking steps to educate the public. At first an

tural stand has a garden frame in which has been installed a thermostatically-controlled soil-heating cable. There are two wheelbarrow equipments on view, one a portable spraying pump and the other a circulating pump suitable for dealing with liquid manure, raising water from sumps, etc. An electric lawn mower and a hedge clipper have been

More Aids for the Farmer.

electric grinder was installed at the Bureau and information as to electrical equipment for the farm was given. Whilst this was adequate for meeting enquiries as to terms of supply, etc., it was found to be insufficient for dealing with the technical aspects of farming equipment, and accordingly there has been opened an agricultural showroom at the head office in Duke Street. Already



included.

In the area a great deal of development in the grinding load has taken place, and considerable interest has been aroused amongst both large and small farmers. An automatic "Essex" mill installation, complete with grain hopper and storage bin has

been built up in the showroom and practical demonstrations can be given. For those who prefer a larger size equipment, there is a "Britton" grinding mill complete with piping, cyclone and sacking off cylinder. For those farmers who wish to combine with their neighbours on the grinding of cereals, a portable "Essex" mill with cyclone for sacking off has been mounted on a four-wheel truck, and is available for inspection.

Pumping Section.—In the reclamation of land, a number of electrically-operated large-sized pumping installations have been constructed in Norfolk and supplied from the Corporation's system. This does not cover all the water-pumping applications on the land, for one of the farmer's most vital needs is water for his stock and premises. Consequently a pumping section has been included, in which is shown a shallow-well domestic pump, a small centrifugal domestic equipment, and a power head for operating a deep-well pump. This is mounted on a well section to show its application more clearly, and with the same idea in mind a small piston pump, complete with stand, tanks, float gear, etc., has been set up to demonstrate automatic operation. A "Reduxo" and a "Devonia" gear unit have each been

exhibited to show their use in operating existing hand-pumps. All the equipment is naturally of the electrically-operated type.

Other Sections.—Deliveries of material have hampered the completion of the Poultry Section, but this will eventually include an electric incubator, a hover and two portable egg-testers. Various miscellaneous items have been distributed around the showroom such as sheep shearers and cattle clippers. The needs of the blacksmith are not overlooked, for many have installed electric blowers to their forges. But the old-time forging is not so prevalent in the countryside nowadays, and so a static a.c. welding plant has been installed in the showrooms. A twin wheel, motor-operated electric grinding machine is also on view, as well as an assortment of workshop tools, drilling machines, etc. In addition a number of photographs show electrically-operated agricultural machinery. As a further help there are wall maps showing various situations throughout the rural area of the undertaking where electrically-operated appliances are in use. In view of recent utterances of the Minister of Agriculture, it is evident that Norwich is on the right lines.

OLDHAM'S JUBILEE

REMEMBER March; the Ides of March "Remember!" Oldham's remembrance of March 15, however, is happier than was Cæsar's, for on that date in 1894 was first switched on the municipal electricity supply. There is now behind it half a century of development and public service. The occasion was fittingly celebrated by the Department with a jubilee dinner on March 15, 1944. The occasion served to bring to mind the early struggles, and even failures, faced by the undertaking until it won through.

The Chairman (**Councillor F. Kenyon**) and the Electricity Committee were hosts to numerous guests, including Council colleagues and former and present staff.

Early Days.—Proposing "The Electricity Undertaking, 1894-1944," the chairman reviewed the Department's activities since its inauguration. When the Committee was first formed in 1890, permission to borrow £25,000 for 25 years was secured. Electricity was first switched on from Rhodes Bank station on March 15, 1894, by Miss A. Smith, daughter of the then Mayor. The selling price was 6d. per unit. By 1896 the undertaking showed a surplus of £848. Extension was needed and the Greenhill site was developed; in which connection the chairman paid tribute to the work of the late Alderman Harrap, then chairman. Loans were sanctioned totalling £150,000. Progress was maintained and since 1906 the Department

had recorded successive profits annually.

Mill Supplies.—About 1905 came the first demand for current for cotton mills; and in 1909 the Corporation introduced a Bill to supply electricity to the out-districts. In 1912 sales had reached six million units yearly and consumers numbered 1,600. In 1914 the Belgrave Mill began operating by electricity, the first mill in the town to do so. Extensions at Greenhill, involving £260,000, followed. Despite the trade slump, by 1922 consumers numbered 5,000 and unit sales were 22½ million. Out-districts were first supplied in 1923. By 1925 the price per unit was 1.3d. Then Chadderton power station was planned with 37,500 kW capacity. About this time the Central Electricity Board came into the picture; Chadderton became a "selected" station.

Councillor Kenyon compared the 1894 and 1944 figures; thus—1894, capital, £320,000; 1944, £3½ million; consumers 55 and 57,000; units sold, 147,000 and 123 million; mains 2.6 miles and 459 miles; annual revenue, £3,848 and £500,000.

"The Guests" were proposed by **Ald. H. Shepherd** (vice-chairman of the Committee), who paid tribute to past and present chairmen, committees, officials and personnel. Replying, **Sir William Chamberlain** congratulated the Committee on the development of the undertaking, and **Mr. S. B. Donkin** added his congratulations.

BUSINESS ANNOUNCEMENTS

Official Notices ; Tenders Invited ; Situations Vacant and Wanted ; Etc.*

TENDERS INVITED

City of Manchester

ELECTRICITY DEPARTMENT

Tenders are invited for the Supply and Delivery of :—

THREE 10-CWT. ELECTRICALLY-PROPELLED VANS
(Specification No. 799).

Specification, etc., may be obtained on application to Mr. H. C. Lamb, Chief Engineer and Manager, Electricity Department, Town Hall, Manchester, 2.

Tenders to be delivered by ten o'clock a.m. on Friday, 31st March, 1944.

R. H. ADCOCK,
Town Clerk.

Town Hall,
Manchester, 2.
17th March, 1944.

APPOINTMENTS VACANT

Metropolitan Borough of Southwark

ELECTRICITY DEPARTMENT— GENERATING STATION

Applications are invited from candidates having a sound technical training, preferably to a degree standard, to fill a position created by re-arrangement of generating station staff.

The salary for this post (which is designated temporary in accordance with the Council's requirements for all similar posts filled during the war) will be in accordance with Grade 8, Class E, of the National Joint Board Schedule (at present £361/370/378, plus 5% for London Area), and conditions of employment, and the appointment will be subject to the provisions of the Shoreditch and other Metropolitan Borough Councils (Superannuation) Acts, 1922 to 1937.

During the war the person appointed will be required to carry out Relief Shift Charge Engineer duties during the four winter months, but otherwise will be mainly concerned with technical work, statistics, testing, etc.

After the war it is expected that shift duties will cease and the candidate may be required to act in the capacity of Technical Assistant on distribution work, including extensive changeover.

Applications, stating age, education, technical qualifications, experience and particulars

of present employment, together with copies of testimonials and a statement with regard to liability for National Service, should be sent to me not later than Friday, 31st March, 1944.

D. T. GRIFFITHS,
Town Clerk.

Town Hall,
Walworth Road,
London, S.E.17.

SCIENTIFIC INSTRUMENT MAKERS are required for a Government Establishment in the South of England.

Rates of Pay. Starting rate :—
75/- plus 21/6 engineering bonus.
to 79/- plus 21/6 " " "

in not more than 3 months. Merit range to 91/- plus 21/6 engineering bonus per week of 47 hours. Present normal working week 57½ hours. All hours above 47 will be paid for at usual overtime rates.

To start within the range of 75/- to 91/- plus engineering bonus commensurate with skill and experience.

Applications in writing, giving full particulars and qualifications, age, experience and name and address of present employers to Box :—"C.J.", c/o Charles Barker & Sons, Ltd., 31 Budge Row, Cannon Street, London, E.C.4.

SKILLED INSTRUMENT MAKERS are required for a Government Establishment in the South of England. Day shift working only is in operation and the average weekly earnings inclusive of about 13 hours overtime are £5 15s. 0d. to £6 0s 0d. Apart from overtime the hours worked are 47 a week.

Applications in writing giving full particulars and qualifications, age, experience and name and address of present employers to Box :—D.K., c/o Charles Barker & Sons, Ltd., 31 Budge Row, Cannon Street, London, E.C.4.

CABLE MANUFACTURE. Applications are invited for the post of Assistant Works Manager and Development Engineer from young men having experience in modern cable production, draughtsmanship and general engineering. The post is permanent and offers good prospects for progress to applicants having initiative. Manchester area.—Please send full details of age and experience in confidence to Box No. 8199, THE ELECTRICAL TIMES.

APPOINTMENTS VACANT—Continued

CABLE ESTIMATOR, fully experienced, required by important company. Paper, Rubber, Thermoplastics, etc. Please state experience, National Service position, etc., to Box No. 8207, THE ELECTRICAL TIMES.

JUNIOR wanted in Kingsway office (age 14 to 16); good pay and prospects.—Apply, in own writing, stating age, to Box No. 8095, THE ELECTRICAL TIMES.

APPOINTMENT WANTED

ELECTRICAL ENGINEER, 35, seeks permanent progressive post. Production, development, fractional H.P. motors, aircraft electrical equipment.—Box No. 8209, THE ELECTRICAL TIMES.

APPOINTMENTS FILLED

The following appointments advertised recently in THE ELECTRICAL TIMES have now been filled:—

West Gloucestershire Power Co.: Shift engineers.

WORK WANTED

VACUUM CLEANER armatures and field coils rewound. Quick service.—ANDERSON'S, "The New Inn" Yard, St. Aldate's, Oxford.

ARMATURE WINDING AND REWINDING. We are specialists in small motor winding and repairs, particularly electric tools. Prompt attention and guaranteed work.—SOUTHERN IGNITION CO., LTD., 190 Thornton Road, Croydon. Phone: THORnton Heath 4276 (3 lines)

STURDY REWINDS. Transformers and Coils, all sizes to 5 K.V.A. Special department for Radio Transformers.—STURDY ELECTRIC Co., LTD., Dipton, Newcastle-upon-Tyne.

PLASTIC MOULDING. Capacity available.—BENDIX & HERBERT, LTD., 231 Plashet Road, London, E.13.

BATTERY CHARGERS MODERNISED. Your old charger made like new by specialists. Conversion from valve to metal rectification. Send for interesting leaflet "S.D." on this Service.—RUNBAKEN ELECTRICAL PRODUCTS, Manchester, 1.

WANTED

SCRAP COPPER, Lead, Cable, Old Machinery and Plant, and any description of ferrous and non-ferrous metals and residues purchased for cash.—W. & H. COOPER, LTD., Brady Street, Bethnal Green, E.1. 'Phone: Bishopsgate 7288-9.

Wanted, **ROTARY CONVERTERS**, any size.—UNIVERSAL, 221 City Road, London, E.C.1.

MERCURY (QUICKSILVER) wanted. Write for packing instructions. Gold, Silver and Platinum also purchased.—COLLINGRIDGE & Co., LTD., Dept. M, Riverside Works, Riverside Road, Watford. (Tel.: 5963.)

Wanted, 250 yds. of .3, .4, or near 4-core lead-covered and armoured **CABLE** for 3-phase 400 volts.—Details to Cox & DANKS, LTD., Hurlingham Wharf, London, S.W.6.

FOR SALE

Heavy-duty ARC - WELDING PLANTS, 200 amps. Price £31 10s. complete. Also Spot Welders, £36 15s.—JOHN E. T. STEEL, Clyde Mills, Bingley. 'Phone 1066.

Motorised $\frac{1}{2}$ in. **BENCH DRILLING MACHINE**, 13 speeds, £11 11s.—JOHN E. T. STEEL, Clyde Mills, Bingley. 'Phone 1066.

BELT GRINDERS or Sanders, 4 in. wide Belt, £5 5s.; 6 in. wide Belt, £10 10s.—JOHN E. T. STEEL, Clyde Mills, Bingley. 'Phone 1066.

ELECTRIC Motors, Control Gear, etc., for disposal; all classes of Electrical Repairs, Rewinds, etc.—OLDFIELD ENGINEERING COMPANY, LTD., 96 East Ordsall Lane, Salford, 5. Telephone Blackfriars 6821.

STURDY TRANSFORMERS. 50 watts to 5 K.V.A. Air-cooled or oil immersed. Prompt deliveries. Quotations by return.—STURDY ELECTRIC Co., LTD., Dipton, Newcastle-upon-Tyne.

The following **INSULATION MATERIAL** is available from Collingridge & Co., Ltd., Ignition and Insulation Factors, Riverside Works, Watford. (Tel.: 5963.)

Large Sizes Varnished Slewing.

Rubber Grommets, assorted.

Bakelite Sheets, $\frac{1}{8}$ in., 1 ft. sq.

Egyptian Cotton Tape, $\frac{1}{2}$ in. and $\frac{3}{4}$ in.

Leatheroid Sheet.

Cards of Hair Dryer Brushes.

Cards of Vacuum Cleaner Brushes.

Twin Screw Solderless Battery Terminals.

Largest Stock Surplus **SEARCHLIGHTS** (sale or hire), Mirrors, Carbon Rods, enamelled cotton and silk Instrument and Resistance Wires, Ebonite, Fibre, T.R.S. Cables, etc.—THE LONDON ELECTRIC FIRM, Croydon.

NEW AND SECOND-HAND BATTERY CHARGERS. Several good second-hand battery chargers, various makes, from £3 10s. h.p. terms. Also new models. All makes repaired and converted to metal rectification.—RUNBAKEN ELECTRICAL PRODUCTS, Manchester, 1.

Self Priming ELECTRIC Pumps, 300 g.h.p.,
 11 1/2 in.—JOHN E. T. STEEL, Clyde Mills,
 Bingley. 'Phone 1066.

For Sale, about 8 tons of ELECTRIC WIRE,
 rubber covered, screened cable, tinsel
 wire, car cable, etc., in short and long
 lengths.—Apply, E. SIEGRIST, LTD., 39
 Ferners Street, London, W.

PATENTS

The Proprietor of British Patent No. 529,907
 for "IMPROVEMENTS IN PHOTO-
 METRIC APPARATUS FOR TIMING
 PHOTOGRAPHIC EXPOSURES," desires
 to enter into negotiations with a Firm or
 Firms for the sale of the Patent, or for the
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 or for making applications for forms of tender, etc., the name
 and address at the end is the person from whom or the place
 where forms of tender, etc., may be obtained.*

Mar. 30.—**Abertillery U.D.C.**: Materials for
 Electricity Department, one year. Mr. Dawson
 Thomas, electrical engineer and manager,
 40 Somerset Street, Abertillery, Mon. Ad-
 vertised March 9 issue.

Mar. 31.—**Wortley U.D.C.**: Electrically motor
 driven borehole pumping unit. Mr. J. Morton,
 clerk, Council Offices, Grenoside, near Sheffield.

March 31.—**Manchester T.C.**: Three 10-cwt.
 electrically-propelled vans. Mr. H. C. Lamb,
 chief engineer and manager, Electricity
 Department, Town Hall, Manchester. Adver-
 tised this week.

April 1.—**Barry T.C.**: Electric lamps, one year.
 Mr. J. L. Davies, borough engineer, Town
 Hall, Barry.

May 10.—**North-West Midlands Joint Authority**:
 (a) Piping equipment; (b) overhead electric
 travelling cranes. Messrs. Merz & McLellan,
 32 Victoria Street, S.W. Deposit £5 5s. each.
 Advertised March 2 issue.

PROSPECTIVE BUSINESS

*The information given below is compiled from various
 sources, and while every care is taken to see that it is accurate
 no responsibility is taken.*

- Bakewell.*—Four houses, for R.D.C.
- Coventry.*—Temporary school at Keresley
 Grange.
- Darlington.*—The T.C. is seeking permission to
 erect 50 temporary bungalows.
- Gloucester.*—Extension to offices for Fielding &
 Platt; two flats, Painswick Road, H. Moreland;
 flats, Northgate Street, Dancey & Meredith.
- Hailsham.*—Four houses at Alfriston, for
 R.D.C.

Hastings.—Central kitchen, off Battle Road; conversion of stables to cottages, etc. Architect, Mr. H. M. Jeffrey.

Hereford.—Two houses, Richmond Street, for H. Carr Braint, Ltd.; demonstration room, Training College, for Hereford C.C.

Leamington Spa.—Nursery. Builders, Stowe & Co.

Manchester.—Completion of 158 flats at Miles Platting and West Gorton; child's welfare centre, Chain Bar, Moston.

Oswestry.—T.C. seeking consent to complete 16 houses.

Rochester.—Block of offices, Barton Road, for Bryning & Ames, Ltd.

Rugby.—Maternity home, Hospital of St. Cross.

Sunderland.—Three flats and shop. Mr. R. C. Blanford, architect.

Tunbridge Wells.—Conversion, 8 Lonsdale Gardens, to flats for Dr. D. Davies.

Twickenham.—Conversion of 44 Strawberry Hill Road to flats, for W. Matts.

Wallsend.—Conversion of premises, Station Road, to British restaurant.

Wanstead.—Alterations, maternity department, County Hospital, for Essex C.C.

Westminster.—Nurseries, Westminster Training College, Horseferry Road, and at 37-39 Bloomfield Terrace.

Widnes.—Conversion of six shops to houses, Widnes Construction Co.

Woolton.—Alterations, Public Assistance Institution, for Northants C.C.

York.—Workshop and offices, St. Lawrence Brickyard, C. Atkinson.

BUSINESS NOTICES

E.W.F.—The Electrical Wholesalers Federation informs us that Alexander McKay, Ltd., 41 Green, Aberdeen, has been elected a member of the Federation, as from January 1, 1944.

Change of Address.—Higgs Motors, Ltd., inform us that they are moving their London office from its temporary address at 6 Coppice Walk, Totteridge, to a permanent address at Kingsway Corner Buildings, 109 Kingsway, W.C.2. Telephone, "Chancery 6316-7-8."

Calendars, Diaries and Almanacs.—From Roper Bros., Ltd., of Dublin, we have to hand a copy of their wall calendar. Normally arranged for January to December, this year publication was delayed; to meet this, the calendar now runs, quite conveniently, from March to the end of February, 1945.

Contractors' Plant

The Minister of Works announces that, as from April 3, the following items have been added to the list of contractors' plant which can be purchased only under permit:—Portable asphalt plants and bituminous mixers; tar and bitumen boilers, asphalt mixers, cookers and cauldrons, patching outfits; gritting machines and cold emulsion sprayers; and bituminous spreaders and finishers. Applications for permits to purchase should be made to A.S.72, Ministry of Works, Lambeth Bridge House, S.E.1.

(Continued on page 363)

ELECTRICAL TIMES

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* Where applicants for posts advertised under box Numbers do not wish their letters to be forwarded to any specific advertiser (such as their own employer) and notify us to that effect, secrecy will be observed by us and the applications destroyed in this office. Applicants applying for positions should not send original testimonials.

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The fact that goods made of raw materials in short supply owing to war conditions are advertised in this Journal should not be taken as an indication that they are necessarily available for export.

PARLIAMENTARY

Scientific Research.—On March 2, **Viscount Hinchingsbrooke** asked the Lord President of the Council whether he will set up a public relations organisation in his Department in order that industrialists and business men may be informed through the Press and by other means of the results of Government-sponsored scientific research and of the extent to which his Department is able to give advice on their research problems. **Mr. Attlee**, in reply, assumed that the reference was to the Department of Scientific and Industrial Research. Before the war this Department carried out an active policy of informing industry and the public of the results of the Department's scientific research, through the general and technical Press, radio, films, exhibitions and lectures. This part of the Department's work would be revived and would form an important part of the post-war activities of the Department.

Industrial Research.—**Mr. Wootton-Davies**, on March 2, asked the Chancellor of the Exchequer whether he could give an assurance that, before introducing his next Budget, he would consider in what ways taxation now stood in the way of the development of industrial research and technological progress; and would he consider taking steps to remedy the deficiency of our taxation system in this respect. **Sir J. Anderson** said he was fully alive to the desirability of encouraging industrial research.

Rural Areas.—**Brigadier-General Clifton Brown** asked the Minister of Fuel and Power whether, in view of the fact that electricity undertakers had a monopoly of erecting lines in their own districts, he would lay down an average standard price to be paid by owners who erected lines on their estates in rural areas to supply their farms and cottages since in many cases electrical installation in country districts was being held up owing to the varied and excessive charges of local undertakers. **Major Lloyd George** said it was not possible to adopt the suggestion, because the cost of extending supplies of electricity to consumers in rural areas varied considerably. In any case, the Electricity Supply Acts gave no authority to lay down an average standard price. This matter was an important part of the development of electricity supply in rural areas, which was receiving the active consideration of the Government.

Television Committee.—The **Lord President of the Council** was asked, on February 29, by **Viscount Hinchingsbrooke** whether he would appoint an additional member to the Television Committee to represent the interests of the user. **Mr. Attlee** replied that, the Committee being primarily concerned with

technical matters, it would not be appropriate to add representatives of outside interests.

Central Register.—On March 1, **Mr. Salt** asked the Minister of Labour for statistics as to the present number of qualified scientific and technological persons in Great Britain, and to what extent the information was available to the Central Register. **Mr. Bevin** said under the "Specified Class" of Persons (Registration) Orders (S.R. & O. 1221 and 1293) persons with professional qualifications as chemists, physicists, civil, electrical, mechanical engineers, and quantity surveyors were required to register, and over 135,000 such persons were registered. With the assistance of the professional institutions, the universities and other bodies, a voluntary registration, believed to be almost complete, had been carried out by the Central Register—nearly 40,000 persons were registered.

Railways (Radio Signals).—**Mr. Hutchinson** on March 7, asked the Parliamentary Secretary to the Ministry of War Transport whether he would consider the possibility of equipping long-distance trains with radio receiving sets so that the drivers could be kept in touch with the controlling authorities in order to avoid the danger of failure to observe signals under conditions of fog. **Mr. Noel-Baker** replied that, although wireless apparatus was being successfully used for certain purposes in railway operation to-day, he was advised that, as at present developed, it would not afford a practicable remedy for failure to observe signals. Experiments were made some years before the war; but they were of a preliminary character, and there were many special difficulties resulting from war conditions. The proposal, however, would be borne in mind.

Research.—On March 15 **Mr. Salt** asked the **Lord President of the Council** to what extent capital grants for research enterprises had been made through the Department of Scientific and Industrial Research during each of the past 10 years; and whether he would consider the desirability of an extension of such grants in connection with post-war reconstruction, especially in connection with the rebuilding and extension of university and industrial laboratories. **Mr. Attlee**, in reply, said with the exception of small grants for purchase of equipment by scientists, no direct capital grants had been made by the D.S.I.R. in the last 10 years, although through its contributions to Industrial Research Associations, the Department had indirectly contributed to their expenditure on capital items. The making of grants for capital purposes was already under consideration as part of a comprehensive

review of post-war requirements; the rebuilding and extending of University laboratories was a matter for consideration by the University Grants Committee in the first place.

Railway Electrification.—**Mr. Higgs** asked the Parliamentary Secretary to the Ministry of War Transport, on March 8, what steps he was taking to extend the electrification of main line railways after the war. **Mr. Noel-Baker** replied that extension of electrification to the main line railways was a matter which would be considered in relation to post-war development. It was already under examination by the railway companies themselves. Asked whether he was aware of the vast amount of replacement which would be necessary immediately after the war, and that an exceptional opportunity would arise for electrification, also that coal consumption will be reduced by more than 50%, **Mr. Noel-Baker** said he should not like to accept the last figure without examination, but a great deal of work on the subject had been done, and the Government was well aware of the opportunities mentioned. Answering **Sir Frank Sanderson** as to whether reasonable

and adequate allowances would be made for depreciation, **Mr. Noel-Baker** said this question could be put on the Paper.

Electricity Distribution.—On March 9, **Mr. Mander** asked the Minister of Fuel and Power when it was proposed to make a statement with regard to the Government's policy concerning the future of the distribution of electricity in this country. **Mr. T. Smith** (Joint Parliamentary Secretary, M.F.P.), replying, said the future organisation of electricity distribution was receiving the active consideration of the Government, but the Minister was not yet in a position to make any statement. **Mr. Mander** asked whether it would be borne in mind that this was one of those instances where public ownership was better than private ownership, as indicated in the McGowan Report, and could there be an assurance that that Report and others would be carefully studied? **Mr. Smith** said he would bear those things in mind. **Sir H. Williams** asked whether **Mr. Smith** was aware that the publicly owned telephones expanded at one-third the rate of the privately-owned electricity supply?

M.O.P. CAPACITY OFFICES

EFFICIENT operation of industrial plants, so that there shall be the least possible wastage in capacity to produce, is of vital urgency just now. To help industrialists in this matter the Ministry of Production has instituted "capacity" offices in connection with its Regional Boards. With the aid of the information available to the Regional Controller, these offices can judge the production capacity of any one works in the region at any time; so that firms having sub-contracts or desiring to place out urgent work, can, by using the services of the capacity offices, ensure getting the work done by factories with suitable plant and capacity to do so, thus keeping the total production figure at maximum. Since its inception the Ministry's capacity office organisation has built up records of about 36,000 firms in the engineering and allied industries; the records are brought constantly up to date; only firms making highly specialised products are outside the scope of the organisation—e.g. firms making radio valves, ball bearings and so on. There are some 72 capacity offices covering Great Britain and Northern Ireland, all linked up with the London headquarters—twelve are regional offices and the others district offices associated with the regional offices. There is a teleprinter service linking headquarters and regional offices, making for speed in handling enquiries. It is a favourable feature of the organisation that all the form-filling which has to be done in com-

piling the records is done by the Ministry staff itself—the industrial managements are saved from this distraction.

How it Works.—The procedure is simple enough. A firm faced with sub-contracting for a job out of its easy scope gets into touch with the district capacity office, which may fix up matters by telephone, or the firm's representative may visit the district office to give full particulars as to the parts, time limit or rate for delivery, and other essential details. It is then decided what are the requirements in machines, capacity and so on for the job; by cross reference the district office judges where the work can be placed, and gets in touch with the firms likely to do it, checking up on the information. Thereafter the main contractor and the suggested sub-contractors are brought into touch, and, when the order is placed, the district office is informed. Should the district office not be able to fix up the production, reference is made to the regional office, which will suggest taking the matter to a second district office in the area; this second district office deals direct with the main contracting firm. Should there again be difficulty, recourse is made to the records at Headquarters, which redirects the enquiry to the most appropriate region. A pamphlet published by the Ministry of Production gives an outline of the scheme and lists the addresses and telephone numbers of the Regional and District capacity offices.

NOTES ON WIRING

I.E.E. REGULATION NO. 112

MY correspondence shows that, in spite of my efforts to explain that single-pole fusing is to be the rule and not the exception on single-phase circuits and sub-circuits, there is still a good deal of misconception in the matter. In some quarters it appears to be assumed that a solid connection of the neutral conductor (without fuses) and removable only for testing purposes, should only be used at the express demand of the supply authority, and that the I.E.E. Regulation 112 does not otherwise demand it. This assumption has been due to the original wording of Reg. 112 in the 11th Edition of the Regulations issued in 1939, which laid down that no neutral fuse should be inserted if the supply was from an a.c. system *declared* by the supply authority to be permanently and effectively earthed. The italics are mine. Well, a supply authority is not always inclined to declare anything, except perhaps in the case of limited companies an interim or final dividend. It is, however, compelled to declare to a consumer the supply voltage, whether the supply is a.c. or d.c., and, in the former event, the frequency. To a request to declare anything else, Shylock's famous reply, "On what compulsion must I? Tell me that," would be deemed appropriate.

So in February, 1943, the I.E.E. issued an amendment to their Reg. 112. By this the contractor has not to await a declaration by the supply authority, but may assume, with some degree of confidence, that the authority has conformed with the Electricity Commissioners' Regulation No. 4, and, on an a.c. system on which the voltage exceeds 125, has permanently earthed the neutral at some point. On this assumption there must, in accordance with the revised I.E.E. Reg. 112, be no neutral fuse. It is necessary to point out, however, that the Commissioners' Regulation No. 4, when it was issued in 1937, was not entirely retrospective, and the consumer or his contractor is quite entitled to ask the supply authority whether the neutral is permanently earthed, at the same time as he notifies the prospective maximum load and applies for supply.

One correspondent seems doubtful as to the position if the premises are supplied single-phase, and the other two phases are not brought in. I can assure him that the conditions are the same. If the supply authority's neutral is permanently earthed, there should be no fuses on the neutral within the building, and the question as to whether the three phases are properly balanced does not come in, at all events, in this connection. On a 4-wire a.c. supply in which consumer's lamps are connected

between outer and neutral, the no-fuse-on-the-neutral rule also applies.

With d.c. supplies some doubt may still exist, for the Commissioners' Regulation permits (but does not insist upon) the inclusion of a circuit-breaker or fuse shunted with a resistance of not more than five ohms in the earthing connection of a 3-wire system. If these are included, the earthing is not permanent, as the breaker will trip on a serious fault in an outer and the potential of the neutral will rise. Nevertheless the consumer's installation must, if I.E.E. Regulations are followed, include no fuses on the neutral—this time in accordance with Reg. 111 (ii) and not 112. If it is known, however, that the neutral does occasionally rise well above earth potential, the use of d.p. fuseboards might perhaps be condoned.

There are still a few die-hards at the supply end who advocate their retention for fear of balancer burn-outs, but wholesale lamp burn-outs at the consumer's end would be equally troublesome, and cases are not altogether unknown of a fault on the neutral blowing a neutral fuse and the installation remaining supplied by current through the fault. In one instance I came across this condition continued for a fortnight before it was discovered.

Returning to a.c., if the premises are supplied through a local transformer, with one pole permanently earthed, whether it be a single-phase transformer or a 3-phase with its star-connected neutral earthed, there must be no fuses on the neutral.

To what extent Reg. 112 should be deemed applicable to existing installations and small extensions to them has already been dealt with in these notes. Under present conditions, I think the answer should be, that it should certainly not be regarded as retrospective, and in any event the I.E.E. Regulations are not statutory. Some people would like an official ruling on this, but I hardly think it necessary. We can afford to wait until the new Basic Regulations are forthcoming. When these are issued, dates of applicability should certainly be given with them, particularly if they may ultimately be adopted as statutory.

I have not dealt with installations supplied from private generating plants, but it is clear that, although Reg. 112 does not apply to them, one pole should be earthed if the voltage is about 125, and there should be no fuses on the neutral. Careful inspection will be necessary to ensure that all s.p. switches are connected to the live pole and that the correct colour scheme is adopted for conductors throughout. **MEGOHM**

THE BUYERS' COLUMN

Portable Soldering and Brazing Machine

Electrode machines have certain advantages for soldering and particularly for hand-soldering. There is no waste of time while the soldering iron heats up and there is no bit to be maintained clean: the carbon rod wears down whilst working. A portable soldering outfit is made by the Acru Electric Tool Mfg. Co., Ltd., 123 Hyde Road, Manchester 12, under the name of "Pyrobrazo." It includes a transformer which steps down the voltage to 3.8 V and gives a current output of 30-120 A. The rating is intermittent for periods of 3-5 minutes. For heavier duty a larger non-portable equipment is available, which may also be used for welding up to 18 s.w.g. metal sheet.

Bonding Rubber to Metal

The term "Elastomeric" engineering has been put forward by the T. B. Andre Rubber Co., Ltd., Kingston-By-Pass, Surbiton, Surrey, to describe the application of their method of bonding rubber to metal. This firm, a subsidiary of Silentbloc, Ltd., use the brass plating method to secure the bond, and it is claimed that loads over 1,000 lb./sq. in. can be carried either in tension or shear. The method has application to anti-

vibration mountings, shock absorbers, flexible couplings, seals, and protective coverings where resistance to abrasion or corrosion is required.

Cutting Compound for Tools

To facilitate certain classes of slow speed machine tool work and many manual operations, such as hand tapping and screwing, in some of which tool breakages are still comparatively high, a cutting compound by the name of "Treflex" has been produced by the Pearl Varnish Co., Ltd., who have now completed arrangements by which it is to be sold by the General Electric Co., Ltd., Magnet House, Kingsway, W.C.2.

This compound is in paste form and is applied to the tool before using. It adheres to the work and melts under the frictional heat generated by the cutting process. Thus a film is spread over the whole of the work and over the cutting edge of the tool. It is not an abrasive; it acts as a cooling agent and lubricant and helps to produce clean, polished surfaces. Tests carried out with the compound have proved conclusively that not only can operations be speeded, but tool breakages have been fewer and the lives of small tools have been appreciably lengthened.

BRITISH STANDARD SPECIFICATIONS

B.S. No. 204.—*Glossary of Telecommunication Terms (price 3s. 6d. net)*. There has just been issued a revised edition of B.S. 204, glossary of terms used in telecommunication. It deals with the subject of Section 9 (Telegraphs and Telephones) and Section 10 (Radiocommunication and Television) of the 1936 edition of B.S. 205 (Glossary of Terms used in Electrical Engineering), which were also published separately as B.S. 204. There is also a short new section on Fire Alarms. A considerable number of new definitions have been introduced, and there has been extensive revision of existing definitions. Some re-grouping of the subjects has also been thought desirable. This has been largely with the object of bringing together general terms used in all branches of telecommunication into an introductory section. The general section is followed by the more specialised sections.

B.S. No. 156.—*Enamelled Wires (price 2s. net)*. A new grade of enamelled wire has been introduced into the specification B.S. 156, a revision of which has been published by the B.S.I. This new grade has a heavier coating of enamel, and the original grade and the new grade are now designated "normal covering" and "thick covering" respectively, the latter being sometimes referred to in the trade as "double enamelled wire." The requirements for the

grade with normal covering are the same as those specified in the 1936 edition of B.S. 156 except for slight modifications to the overall diameters in order to bring them into line with modern practice in manufacture. A few additional sizes have also been added. The specification defines the quality of the copper, the thicknesses of enamel, and the limits of resistance. Electrical and chemical tests are included.

B.S. No. 308.—*Engineering Drawing Office Practice (price 3s. 6d. net)*. A revised and considerably enlarged edition of B.S. 308 has now been published. The recommendations for standard practice commence with sizes and typical layouts of drawing sheets, and the planning, numbering and referencing of series of drawings. Recommended scales, types of line, methods of projection, lettering, dimensioning and sectioning are set down, followed by standard methods of indicating machining symbols, surface finish, screw threads, bolts, nuts, rivets and welds. Appendices deal with the reproduction of drawings and the selection, preparation and storage of drawing paper, tracing paper and cloth, and sensitised materials.

B.S. No. 430.—*Solid Drawn Air Receivers (price 2s. net)*. This specification replaces the first edition published in 1931 and has been revised.

LETTERS TO THE EDITOR

We cannot be responsible for the opinions and expressions of our Correspondents

Post-War Supply Development

SIR,—As you are aware, a meeting of members of the I.M.E.A. was held at the Central Hall, Westminster, to consider and approve, if thought fit, the White Joint Memorandum on Distribution, and I.M.E.A. Brown Memorandum on Ownership of Distribution Undertakings, Ownership of Generating Stations, and National Bulk Supply Tariff.* My personal impressions of this meeting, which I attended in company with my Chairman, and also views upon the whole subject after careful and long study might perhaps be interesting and helpful to your readers, particularly those who are I.M.E.A. members.

I may say at the outset that I am not enthusiastic about "post-war planning." I admit that a certain amount is necessary in certain spheres, but "post-war planning" is seized on by a large body of people as something they must be busy with during the war, and the majority of schemes of this nature are uncalled for and are "cluttering up" the war effort directly and indirectly.

I could see running through the proceedings at the meeting the same errors which blinded people in the nine years preceding the war, that is to say, they were willing to cart away the ruins if they couldn't have their political prejudices satisfied. The meeting was held to determine the best and most efficient method of electricity development and not to foster political beliefs.

During the last twenty years the main reduction of electricity costs has been due to technical brains in respect of the wonderful developments in efficiency of plant, and as a result an almost equal economy has resulted from the large units of plant, lowering the cost per kW. The progress attributed to the Central Electricity Board has been very much exaggerated. The advantages put forward for the transfer of Generating Stations to the Central Electricity Board are largely padding and platitudes, which in the main would have no realisation in fact if the transfer were made. I am open to conviction, however, if as a result of a thorough technical investigation favourable and convincing arguments could be put forward.

I am not satisfied with the constitution and structure of the I.M.E.A. Surely, the matters voted upon were the concern only of Local Authorities and should only be voted upon by Local Authority members, after taking technical advice from their engineers. As it was, half the voting power was held by engineers. It seems to me that engineers

exercising their free will in voting was wrong and if they were instructed to vote a certain way by their Authority, it was also wrong. It is for the Local Authority representatives to bear the whole onus and responsibilities of voting on such matters.

I am also in disagreement with the constitution of the I.M.E.A. as regard voting power. At present each undertaking has two votes and the following statistics compiled from the Electricity Commissioners' Returns for the year ended March, 1938, published in 1939, will show the absurdity of the voting. These Electricity Commissioners' Returns are the last published and no later figures are available. If the present-day figures were available, the percentages of output in favour of the "Selected Station Owner" members of the I.M.E.A. would be accentuated.

The 10 largest I.M.E.A. "Selected" station undertakings include in their areas of supply 25.3% of the total population receiving electricity from members of the I.M.E.A.

The 45 largest I.M.E.A. "Selected" station undertakings are responsible for the supplies of electricity to 50.3% of the population receiving electricity from I.M.E.A. members, although these 45 members, out of a total of 336 members, only have 13.4% of the voting power.

The 93 I.M.E.A. "Selected" station undertakings supply electricity to 64.5% of the population supplied by the I.M.E.A. in total, to 64.7% of the consumers, supplying 70.1% of the electricity used for lighting, heating and cooking, and 74.7% of the total supplies of electricity given by I.M.E.A. members, but they only have 27.7% of the voting power.

The result of the voting on the present basis means that a small percentage of electricity supply authorities, reckoned in units sold or population served, have magnanimously recommended that the generating stations of the greater majority, based on the same interests, should be handed over to a central authority without any other effective reason than the hope that it would make electricity cheaper for them in the form of a national Standard Bulk Supply Tariff.

If it comes to pass, I hope that it will not have similar results in operation to another centrally controlled commodity which has been upsetting the financial stability of the electricity supply industry for some time back. Like the story of the Aberdonians who protested against a decrease in the tram fares because they could not save so much by walking, it looks as though in travelling down the path of further thermal efficiency savings we will be enabled to save much more than we have done in the past, if the price of fuel goes much higher.

March 18 JOHN R. STRUTHERS, M.I.E.E.,
General Manager.
Sheffield Corporation Electricity Department.

* The Joint Memorandum was referred back; the Ownership Report was adopted. See METEOR, p. 335.

PERSONAL

The Norwich Council has decided to make an interim increase in the salary of the city electrical engineer, **Mr. J. A. Sumner**, such that, during the year commencing April 1, 1944, he will receive £1,840 per year, exclusive of any emoluments already granted.

Many of his electrical friends will be gratified to note that **Mr. Howard Marryat, M.I.E.E., M.I.Mech.E.**, stood at Faraday's lecture table at the Royal Institution, on March 17, to give one of those "Friday Afternoon Discourses," for which the R.I. is world-famous. Mr. Marryat's lecture (we learn from R.W.K.) was devoted to the evolution of watchmaking, based on, and illustrated by, his own collection of historic watches. It may not be very widely known that Mr. Marryat's assembly of watches is regarded as one of the finest collections of such time-pieces in private hands in this country, and one hundred or more specimens were shown at the Royal Institution in support of his remarks.

Mr. R. H. Howatt, formerly manager of the Birmingham office of the Brush Electrical Engineering Co., Ltd., has been promoted to an executive appointment at the head office at Loughborough; **Mr. E. Leslie Brooks, A.M.I.Mech.E., A.I.E.E.**, has been appointed manager of the Birmingham office. Mr. Brooks was chief technical sales engineer of Petters, Ltd., a subsidiary of the Brush Company, in which capacity he was well known in the South and West of England.

Mr. F. E. C. Miller has been elected a director of the Edison Swan Electric Co., Ltd. Mr. Miller has completed over 20 years' service with the Company, during which time he has held the positions of London manager and manager of the Lamp Department.

Mr. B. J. Darlow, who was for some years before the war mains engineer with the Oxford City Corporation Electricity Supply Department, has left for Ceylon, where he will be in charge of an Admiralty electrical base.

Mr. J. Eerdmans, managing director of De La Rue Insulation, Ltd., and also a director of De La Rue Plastics, Ltd., has now been appointed sales director for both companies. The appointment means that the entire sales of the plastic products of the two companies, at home and abroad, will be under Mr. Eerdmans's control.

Mr. F. G. Cooke, who was general technical manager of De La Rue Insulation, Ltd., has now been appointed chief of the Development Division of De La Rue Plastics, Ltd., and its subsidiary companies, both in the United Kingdom and overseas. **Mr. R. B.**

Harley, as chief chemist, will control the whole of the chemical research.

Mr. Albert Sadler has retired from the position of general manager of Erinoid, Ltd., but will continue as a director. **Mr. John Harvey** has been appointed general manager as from January 1.

Obituary.—It was with very sincere regret that we heard of the death of **Mr. H. Lingard, M.B.E., M.I.E.E., F.I.E.S.**, manager of the E.L.M.A. Lighting Service Bureau, at the early age of 40 years. He died on March 12 at his home at Cuffley; a gap is thus left in the front rank of lighting men which it will be hard to fill. He had been associated with the E.L.M.A. Bureau since its inception, and his years as chief of the Engineering Department, and then as deputy manager, won him a host of friends, who warmly welcomed his appointment as manager at the beginning of 1939. With the advent of war, his activities were temporarily transferred to the Ministry of Supply, and it was in recognition of his services as their principal lighting and power officer that he was made an M.B.E. in the 1943 Birthday Honours. He visualised great things for lighting in the future, and although very busy with his Government work, never failed to keep



Mr. H. Lingard, M.B.E.

close touch with the Lighting Industry, and, during recent months had found time to take an active part in the preparation of the post-war plans of the Lighting Service Bureau. He leaves a wife and three young children, to whom our deep sympathy is extended.

Another gap in the ranks of well-known municipal electrical engineers of the older generation is caused by the death, at Salisbury, on March 2, of **Mr. Russell Forrester Ferguson, M.I.E.E., M.I.Mech.E.** A Glasgow man, trained in mechanical and

electrical engineering in that city, Mr. Ferguson was for a time a marine engineer. Thereafter he gained experience in London power stations and ultimately became borough electrical engineer at Fulham. This position he left to take up a similar appointment at Hastings, and it is in that connection he will be best remembered. Under his care the Hastings undertaking expanded and grew strong; he designed and superintended the building of a new power station (in 1925); he was responsible for a bulk supply being given to Bexhill and for supply in an area of about 154 square miles round Hastings. He retired on reaching the age limit and was 83 years of age at his death.

Our sympathy is extended to Mr. Harry Allcock, M.I.E.E., M.I.Mech.E., export manager of W. T. Glover & Co., Ltd., Manchester, on the death of his wife, **Mrs. Grace Allcock**, on March 2.

The death occurred recently, at the age of 77 years, of **Mr. Robert Armitage**, head of the Farnley Ironworks, Leeds, and a director for many years of the Yorkshire Electric Power Co. and the Electrical Distribution of Yorkshire.

The death has been announced of **Mr. Robert Waycott**, a director of the Paignton Electric Light & Power Co., at the age of 88 years.

NOTES AND NOTICES

Birmingham Electric Club

In the piping days of peace, the Birmingham Electric Club held its annual dinner about this time of the year; such functions were very popular. This year, on the day of the annual meeting, the Club arranged a luncheon at the Grand Hotel, Birmingham; it was very well attended and generally a success. The President, **Mr. A. M. Fletcher**, proposed "The Guests"; this was responded to by **Mr. E. B. Banks** (English Electric Co., Stafford), and **Mr. F. W. Lawton** (Chief Engineer and Manager, Birmingham Electric Supply Department). A collection taken on behalf of the E.I.B.A. realised some £17.

London Transport

The report of the London Passenger Transport Board for 9143, just issued, shows a net revenue, after adjustment with the Government in respect of control, of £4,714,126, against £4,840,705 in 1942. The net revenue includes the fixed annual sum receivable under the Railway Control Agreement (£4,835,705, less saving of interest resulting from stock redemption (£179,066), but with £57,487 added in respect of a "pool" adjustment for the year 1940. The "C" stock gets a final interest payment of 2%, making 3¼% for the year, comparing with 3% in 1942. The body of the report deals mainly with the restriction of use of fuel and rubber and the consequent curtailment of road services; though the passenger service shows marked increase, especially on the railways. The Board is considering, in conjunction with the main line railway companies, the probable post-war requirements for the area in which it operates, also an eye is being kept on the proposals of authorities and bodies in the district. There are 22,104 of the Board's staff in the Fighting or C.D. Services; 177 died on service, making 407 since the start of the war; while by enemy action 146 have been killed and 442 injured. Honours or awards now number 80.

P.A.Y.E.

In order to get employees acquainted with the Pay As You Earn system as simply and quickly as possible, the Metropolitan-Vickers Electrical Co., Ltd., is distributing to its workpeople a Pay As You Earn "Quiz." There are 21 questions such as are most likely to require elucidation by employees, and the answers are given in language as simple as possible. This is a good idea, calculated to give the workers confidence that the management desires to help with what to many will be difficult to understand.

Fire Guard's Pocket Chart

From Jordan & Sons, Ltd., 116 Chancery Lane, W.C., we have received a copy of the second edition of the Fire Guard's Pocket Chart. This useful publication is in handy form for reference by those who do fire-guard duties—there are pictures, diagrams, tables and general particulars concerning incendiary and other bombs and how to deal with them, the operation of fire-guard equipment, and useful notes on first aid and other matters. The pocket chart costs only 4d.

Standard of Lighting

The Minister of Fuel and Power has, under the Control of Fuel (No. 3) Order, 1942, given a General Direction (Standard of Lighting) No. 2 (S.R. & O. 1944 No. 234) (price 1d., H.M. Stationery Office). This amends the General Direction (Standard of Lighting) No. 1 (S.R. & O. 1943 No. 1210), which lays down the maximum standards of illumination in shops, hotels, restaurants and places of public entertainment, sport and meeting. The amendment provides that, as from March 20, 1944, the maximum standard of lighting in any room, compartment or enclosed space shall be calculated separately, and shall not be affected by the fact that the lighting used may also incidentally illuminate some other place.

ELECTRIC SUPPLY NEWS

Cheltenham.—At the monthly meeting of the Town Council the deputy mayor, Councillor T. W. Waite, mentioned the forthcoming electrical legislation. After paying tribute to Mr. W. J. Bache, the former borough electrical engineer, and others for their part in placing Cheltenham in a successful position in electricity supply, he said that the Electricity and Lighting Committee was justified in taking strong exception to any proposal which might result in the Cheltenham undertaking forming part of a consolidated one not owned by municipal authorities either singly or jointly. He thought the Government would be advised to leave the electricity supply industry in the hands of the local authorities. If the undertaking were taken over by a statutory Board it would lose its identity and the town would have to surrender, for less than the

commercial value, the whole of the undertaking; also street lighting would cost the town more.

Glasgow.—The Corporation at a special meeting recently unanimously agreed to a resolution favouring the extension of public ownership of electricity undertakings in post-war policy of the organisation of supply. The decision was of the nature of an instruction to the Glasgow representatives who attended the I.M.E.A. meeting on March 16. The resolution approved was that the proposals be supported for the setting up of distribution areas and for the retention and extension of public ownership of electricity undertakings, for the generation of electricity under the Central Electricity Board, and for the introduction of a national standard for bulk supply tariffs, subject to suitable protection for the owners of selected stations.

PROVINCIAL ELECTRIC SUPPLY ASSOCIATION

THIS Association held its twenty-third annual meeting on March 3. **Mr. Selwyn S. Grant**, in the chair, welcomed **Lord Brabazon**, president of the B.E.D.A., who addressed the gathering. He spoke of the importance of the P.E.S.A. in the Electricity Supply Industry and stressed the need for the Industry to have a common policy.

Mr. Selwyn Grant, after sympathetic reference to the death of Col. Bridges, briefly reviewed the activities of the Association. He regretted that, despite a number of meetings and consultations with the Electricity Commissioners, not much progress had been made with the question of bulk trading conditions. The War Damage to Public Utility Undertakings Bill was still awaited, despite repeated requests to the Treasury for expedition. With other supply interests in a strong committee, of which Mr. Mekie was convener, the Association had appeared before the Minister of Town and Country Planning and the Minister of Fuel and Power, on the provisions of the Town and Country (Interim Development) Bill. The Association considers its interests are prejudiced by the powers sought in the Bill. The Inland Revenue authorities had agreed to continue "wear and tear" allowance on generating plant at 8% for the next two years, and to continue writing down of the value of meters by 7½% per annum indefinitely. As to the Joint Committee, this, on the withdrawal of the Power Companies' Association, has been provisionally renamed the "Joint Committee of Electricity Supply Organisations," but 11 power companies, "and those not the least important," had rejoined the Committee as a Power Company Group. The P.E.S.A. is of opinion that the Committee

serves a most useful and helpful purpose. Mr. Grant then paid tribute to the late secretary, Mr. Home Morton.

As to fuel rationing, unless consumers practised the utmost economy, this might still be necessary. Mr. Grant then briefly recapitulated the position with regard to the Joint Committee memorandum. At the moment he preferred not to comment on the I.M.E.A. Memorandum (Ownership); members would have seen references in the Press to the proposals of the E.P.E.A. and the London and Home Counties J.E.A., the one issued without real authority, the other putting forward views of a sectional interest. The time had come for plain speaking on "ownership." The man in the street did not care two straws who owned his undertaking, provided he got his supply at the right price. There was, however, the person with a loud voice who gave the parrot-cry "Nationalisation" a dangerous cry. All things being equal, the price charged by company-owned undertakings compared favourably with any other class of ownership. The company-owned undertakings had been pioneers in supply development in rural England. Those comparing rates of supply, therefore, should have regard to size and nature of areas and to density of population. The company-owned undertakings had no need to be ashamed of what they had accomplished. Finally, Mr. Grant paid tribute to the work of Mr. Fippard, the vice-chairman, on the "Post-War Reconstruction Memorandum," also to Sir John Dalton (hon. secretary), to Mr. E. G. Baker (assistant secretary), to Mr. I. R. G. Jones (legal) and others who had represented the Association on various bodies and committees.

ELECTRICAL COMPANIES

Dividends.—*Vickers.*—Final dividend on ordinary, of 6%, less tax, making 10% for 1943.

British Insulated Cables.—Final dividend of 10%, and cash bonus 5%, making 20%, less tax, for the year. (Profit £1,130,253.)

Ericsson Telephones.—Final dividend of 12% and bonus of 3%, each tax free, making 20% for 1943.

Pyc (Ireland).—Dividend for 1943 of 7½%, less tax. (Trading profit £7,467, carried forward £5,282.)

North Somerset Electric Supply Co.—Dividend of 7% for the year.

Electrolytic Zinc Co. of Australasia.—Dividend of 4% for half-year ended December, 1943.

Oakham Gas & Electricity Co.—The report says progress has continued. The dividend is 3% p.a. on the original ordinary shares, and 2.1% on the additional ordinary, all less tax.

Oxley Engineering Co.—The Treasury has sanctioned the issue of 300,000 new ordinary shares of 5s. each at 8s. 6d. per share, for the purpose of acquiring the business of Thomas Dryden & Sons, Ltd., mechanical and electrical engineers, Preston.

North-Eastern Electric Supply Co.—The report states that the profit for 1943 was sufficient to justify payment of the preference dividends and a final ordinary dividend of 4½%, making 7% for the year, subject to tax. Lt.-Col. E. H. E. Woodward, general manager, has been appointed director.

Northampton Electric Light & Power Co.—The annual meetings of this and the associated Rushden & District Electric Supply Co. are fixed for March 17. The reports regret inability to publish the accounts. The final dividend on the Northampton ordinary stock is 6%, making 10%; on the Rushden Co.'s shares a final of 5%, making 9% for the year.

International Combustion.—The gross profits for the year to September last were £216,249 and the net profit £106,389. The final ordinary dividend is 15%, with a bonus of 10%, making, with 5% interim, 30%, less tax. The amount carried forward is £61,813. The chairman, Mr. G. R. T. Taylor, states that orders in hand are satisfactory, and the plant being employed to its fullest capacity. Output compared favourably with previous years.

Bournemouth & Poole Electricity Supply Co.—A special meeting has been called to consider a resolution providing for an alteration to the articles of association, in order to enable the company to appoint as a director a person who may be a paid official of the company. The only paid office that a

director can hold at present is that of managing director.

Lancashire Electric Light & Power Co.—The balance of profit and loss for 1943, before income tax, is £370,466, plus £15,415 brought in. After provision for debenture interest, taxation preference and interim ordinary dividend, there is £89,878. The final dividend is 5%, making 7½% for the year, leaving £14,878 to go forward. The operation of the subsidiary companies continued satisfactorily throughout the year.

Electrical Distribution of Yorkshire.—The report, conforming to regulations, has no financial details. It is mentioned that Mr. W. R. T. Skinner is appointed general manager of the company and its subsidiaries, in succession to the late Col. Fraser. Extension of the company's system has been restricted to provision of essential services only. Negotiations have been concluded for taking over of a small "non-stat" company, and the transfer was effected on March 1. The dividend on the ordinary stock, including 4½% interim, is 9% for the year. The statement of Mr. R. W. Wickham, the chairman, says that the domestic consumer does not appear to realise how by economy in use of energy, if only a little, can materially assist the war effort—the accumulated effect of small economies can be quite important. All the subsidiary companies had carried on satisfactorily despite restrictions on expansion. It was, generally speaking, to so-called private enterprise that rural communities in this country must turn for electricity supply—in Cumberland there was a good example of many farmsteads and cottages now enjoying the advantages of electricity. His expression "so-called private enterprise" called attention to the fact that, far from being privately owned, their company had actually 6,402 shareholders, with an average holding of 435 shares—more than two-thirds held fewer than 500 and one-fifth less than 100 shares each; to call this private ownership, with the sinister aspect attributed to it by some politicians, was absurd. As to forward planning, practical considerations, not political, should be the guide; electricity, a highly technical business of great importance, should not be the subject of large-scale experiments without the most informed consideration of all possible effects on the consumer.

Clyde Valley Electrical Power Co.—The report is cut to a mere dividend statement—the final on the ordinary stock is 5%, making 8% for the year.

Taylor Tunnicliff (Electrical Industries).—In his statement with the report, the chairman says loss of personnel, with difficulty of

replacement, has, to some extent, affected production costs. So some reduction in business done is noted, the high level of the previous year not having been attained. The net trading profit, plus sundry income of the operating companies, is £83,295, against £99,113 for 1942. The interim dividend was 2½% and the final is 7½%, making 10%, against last time's 15%.

THE BRITISH THOMSON-HOUSTON COMPANY LIMITED

Urgent Problems for the Future

Need for Concerting Plans

Mr. H. N. Sporborg's Speech

The forty-ninth ordinary general meeting of the shareholders of the British Thomson-Houston Co., Ltd., was held on Monday, March 20, at the Company's offices, Crown House, Aldwych, London, W.C.

Mr. H. N. Sporborg (the chairman) said: Gentlemen:— Before dealing with the accounts, it is necessary for me to refer to the serious losses our Company has sustained since our last meeting in the deaths of Mr. Joseph L. Wilson and Mr. William C. Lusk.

Mr. Wilson, who died in April of last year, became a member of the board in July, 1927, and, until his death, was manager of the Company's Commercial Department in charge of apparatus sales.

Mr. Lusk, who died in February of this year, became a member of the board in November, 1910, and was elected to the position of chairman in 1929, and held this position until his death.

Each of these gentlemen rendered outstanding service to our Company and to the industry which we serve, and I would ask you to rise and stand for a moment in silent tribute to their memory.

The meeting having stood in silence, the Chairman continued: Your board have done me the signal honour of electing me to the position of chairman, made vacant by Mr. Lusk's death, with the valued support of my colleague, Sir Felix J. C. Pole as deputy chairman, which explains my position before you to-day. I am sure that Sir Felix would wish me to say, on his behalf as well as my own, that we will do everything in our power to assist the Company to maintain the high position in the industry which it has occupied for so many years.

As will be seen from the report of the directors which is in your hands, the profit

for the year, after deducting all expenses and charges, other than interest on debentures and loans, and after providing for taxation, was £580,362, as compared with £562,883 for the previous year. In accordance with our usual practice the words "after providing for taxation" mean after providing for the taxation arising from the profits for the year covered by the report, including the taxation applicable to dividends, and the dividends are accordingly shown net after deduction of the tax applicable to them.

After deducting interest on debentures and loans, £87,230, and depreciation, £226,435, there is a balance of £266,697, as compared with £259,258 for the previous year. To the balance of £266,697 there is to be added the amount brought forward from the previous year, £254,171, making the total to be dealt with £520,868, as compared with £476,671 for the previous year.

Dividend of 7%

It is proposed to transfer to the general reserve account £150,000, thereby raising it to £1,150,000. The dividend on the 7% preference shares, less income-tax, amounting to £52,500, has been paid, and your directors recommend the payment of a dividend on the ordinary shares at the rate of 7% for the year, less income-tax, £70,000, leaving £248,368 to be carried forward to the new account, as compared with £254,171 brought in from the previous account.

The other items of the accounts call for no special comment other than to point out that the increase in the value of goods in process of manufacture is indicative of the Company's increase in output, which again is reflected in the increase in the amount of our loan as compared with the loan at the end of the previous year. The amount of our 5% debenture stock outstanding has been reduced by drawing of the amount required by the trust deed.

Efficiency of Plants

Our manufacturing plants have been maintained during the year in as high a state of efficiency as possible under existing conditions. Our capital expenditure on manufacturing equipment and buildings during the year has been necessarily curtailed by the prevailing conditions, but we have fully maintained our established practice of past years by writing-off to depreciation of our plant account the sum of £226,435.

The Company has continued to assist its employees to maintain their contributions to the National Savings Movement, and our payments to our employees who have joined H.M. Forces have been continued and have increased as more of our staff have joined the Forces. These arrangements, we feel sure, have been helpful and are appreciated by the recipients.

We have maintained to the utmost, in these difficult times, our considerable activities in the education and training of young engineers—a matter to which we have always attached the greatest importance. Our research staff and laboratories have been augmented, and I need not stress the vital importance of research to our Company, the industry, and to the post-war National situation. We have also maintained our extensive arrangements for the training of operators who are newcomers to the industry

Work on Jet Engine

It is, of course, not possible for me to refer in any detail to the Company's great contribution to the war effort, but I should like to express to the authorities concerned our satisfaction at their permission to refer through the technical press to the Company's work with Group-Captain Whittle and the Power Jets Company in the development of the jet engine, and I take this opportunity to congratulate Group-Captain Whittle on the honour conferred upon him by H.M. The King.

I will not detain you with a long dissertation on the many aspects of the problems of post-war industry which are now being discussed by so many people, but I would like to say that your board is fully alive to the many urgent problems that will need to be dealt with as soon as a change in the war situation permits.

Until that time arrives our total effort must be concentrated on our manifold activities in support of the war effort, but we are fully alive to the need for concerting our plans for the changeover well in advance, and trust that we will receive the full co-operation of the departments concerned when those plans can be put into effect.

Services of the Staff

In closing, I should like to pay a well-deserved tribute to the splendid service rendered by the Company's staff and work-people. From our regular employees we have received the same loyal service that they have always rendered to the Company, but intensified by war conditions—but I would like to add a particular word of appreciation to the many temporary workers, both men and women, who have joined us to contribute their services to the war effort. Many of them are new to factory life, but I think a word of commendation is due to them for the cheerful way in which they have accommodated their lives to totally new conditions and have given loyal service to the common cause.

The report of the directors, together with the Company's accounts to December 31, 1943, were approved and adopted; the retiring directors were re-elected and the auditors re-appointed.

MIDLAND COUNTIES ELECTRIC SUPPLY

Mr. William Shearer's Views

The 31st ordinary general meeting of Midland Counties Electric Supply Co., Ltd., was held on Thursday, in London.

Mr. William Shearer (chairman), in the course of his remarks said:—The accounts before you to-day reflect the financial stability of the Company and will, I feel sure, be regarded as amply justifying the confidence you have invariably shown in its direction and management. Once again all demands made on our operating properties have been successfully and efficiently met, due in no small measure to the untiring efforts and loyal services of our diminished staffs and employees. You have a sound and stable investment.

The non-publication of detailed information and the absence of statistics during the war period, indicative as these are of the immense contribution the industry has made in the country's emergency, have no doubt somewhat assisted the exponents of State or Regional control in their endeavours to lead public opinion along their chosen paths.

We are attacked as having a free field, no competition, and a statutory right to charge for the commodity we sell. Have we no competition? You are well aware that there are several competitors in the field for heating, cooking, and power purposes, some of them powerful, highly developed, and with ample resources. As to charges for current supplied, this matter is already the subject of statutory control, as is also the limitation of dividends payable to shareholders. If in certain cases existing safeguards of this kind are found to be not altogether effective, there is no difficulty in altering or extending them by simple means. But not a shred of evidence has been adduced to prove that what is commonly called private enterprise, but which more fittingly might be described as business management, as applied to our industry has failed.

I feel confident that you will support us in contesting with all the strength at our command the proposals involving the revolutionary changes now being advanced.

No one can dispute the fact that by experienced business management the power companies have built up, within the limits of somewhat hampering legislation, highly efficient public-spirited undertakings, and it is to them that the enormous development of electricity supply outside the larger towns has been due. Surely, then, it would be a retrograde step to allow the disruption of these successful units to materialise.

Next in importance is the question of greater uniformity of tariffs and some

standardisation of low-voltage distribution systems and voltages. Neither presents insoluble technical difficulties, but both involve material financial considerations, which, however, I feel sure can be overcome in a businesslike manner without recourse to anything akin to nationalisation of the industry. Finally, there is the demand for more intensive development of supplies in the rural areas. I am confident that, whenever circumstances permit, the company-owned undertakings will lose no time in overtaking this delayed service.

I think it is a fair conclusion from these observations that there is no need for nationalisation of electricity supply in any form or for universal dislocation of the industry, irrespective of needs or consequences by the inauguration of regional or public boards or the municipalisation of company undertakings.

The report was unanimously adopted, and a final dividend of 5%, making 8% for the year, was approved.

BRITISH POWER & LIGHT

Increased Sale of Energy

The fifteenth ordinary general meeting of British Power & Light Corporation, Ltd., was held on March 17, in London. Mr. R. Nelson, M.I.M.E., M.I.E.E. (acting chairman) presided.

The following is an extract from the acting Chairman's statement circulated with the report and accounts:—

The consolidated profit and loss account gives a clear picture of the combined results of the year's working. The revenue from sale of energy has increased by approximately £177,000, against which the cost of energy generated and purchased has increased by approximately £162,000. The margin of gross profit on the increased sale of energy, namely £15,000, is small, principally on

account of the effect of the continued increase in the price of coal on the cost of current purchased. The amount needed for taxation continues to rise, and while our trading profits are substantially the same as last year, we have to provide no less than £15,000 more for taxation purposes.

The year has been one of steady increase in the demand for electricity. Our subsidiary companies have met all demands made upon them, and in spite of increased running expenses, none of them has found it necessary to increase its charges. In connection with the further development of the resources of North Wales, we have appointed two eminent engineers to investigate the further water power resources within the area. The prospects, so far as it has been possible to gauge them, are encouraging. There is further water power available, but it is as yet too early to say whether its economical development is a practical possibility.

Post-War Electricity Supply

On the subject of the post-war development of electricity supply, the Ministry of Fuel and Power may well feel bewildered by the flood of statistical argument intended to show that this or that section of the industry has best served the public interest. In weighing the respective merits of company and municipal enterprise, I hope it will not be overlooked that without private enterprise there would have been little or no rural development, to which so much importance is now, rightly, attached.

The power companies were first created to meet an anticipated demand for power and bulk supplies. They did so; and still to-day the cheapest power for the use of industry generally is to be obtained from them. Left to continue, as we may reasonably hope they will be, there are important extensions still to be undertaken which they are in the best position to carry through.

The report was adopted.

CASES IN COURT

Contravening M/C Tool Control

At Willesden Police Court on March 16, A. J. and F. Mickleburgh, of Stonebridge, were summoned for disposing of a controlled machine tool otherwise than in accordance with the directions of the Ministry of Supply; with failing to keep a register showing the particulars of the disposal; and with failing to furnish a return to the Ministry of Supply of the disposal. Mr. F. C. Mickleburgh was similarly summoned as a director of the firm. The defendants pleaded guilty. The prosecution said the defendants were authorised dealers and the transaction complained of related to the disposal of a secondhand machine tool, a lathe, to another authorised dealer. The defendants had also failed to

keep a record of the sale and had failed to furnish a return of the sale to the Ministry. The lathe had been sold for £135. The disposal of machine tools was subject to control to ensure that tools went to firms engaged on work of national importance. When Mr. F. Mickleburgh was interviewed, he admitted he had sold the lathe, but said it was his personal property; the sale had been recorded in the firm's books in error. In evidence he said he bought the lathe in 1939. Last August he sold it, being satisfied that it was needed for priority work. Later he discovered that a mistake had been made and that the lathe sold belonged to the company and was not his. No attempt had been made to conceal the matter.

The Bench fined the company and Mr. Mickleburgh £100 on each summons, total £300 each, also the firm to pay £21 costs

"Fun Fair" Electricity

During a prosecution at Old Street, on March 9, the magistrate, Mr. Rowland Thomas, K.C., was informed that the electricity bills for an "amusement arcade" averaged £7 10s. a week. The automatic machines were operated electrically; the place was well lighted and there were two heaters. He commented: "They allow these pleasure centres to go on wasting that which we are told, as private individuals and commercial people, should be economised. Something should be done about them. I think it is a perfect outrage."

Illegal Consumption

At the Thames Police Court on March 7, three Poplar men and two women were fined either for fraudulently diverting or consuming electricity, the property of the Fixed Price Light Co., Ltd. Mr. E. Fail, prose-

cuting, in the case of T. Hamp, said the man was entitled to use a 60 W lamp, but an inspector found him using an electric fire and an extra 40 W lamp. He pleaded guilty and was fined £7, with three guineas costs. Miss D. Robertson admitted a consuming offence. She was entitled to use two 40 W and a 60 W lamp. An inspector found a lead running to an air raid shelter in the back garden and to a wireless set. She was fined £3 with a guinea costs. J. Linburgh admitted fraudulently diverting electricity; he used an extra 40 W lamp and a wireless set. He was fined £5, with two guineas costs. S. Noble, widow, was fined £2, with a guinea costs for diverting electricity. She pleaded guilty. She was allowed to use a 100 W lamp, but a lead had been run to a disconnected plug and to a wireless set. She had been fined for a similar offence in 1937. G. Finch denied fraudulently diverting electricity; he was found guilty, fined £3, with a guinea costs. He should have used a 15 and a 100 W lamp, but used wireless set.

BUSINESS ANNOUNCEMENTS

Continued from page 350

COMMERCIAL INTELLIGENCE LONDON GAZETTE

Companies Act

Ogmore Valley Electric Light & Power Supply Co.—General meeting of members at Ogmore Valley Hotel, Ogmore Vale, on April 21, at 3 p.m., to receive report of Mr. A. P. Adams, liquidator, on winding-up.

Birkdale District Electric Supply Co.—Meeting of members at 88 Kingsway, W.C., on April 19, at 11.30 a.m., to receive report of Messrs. F. J. Cursons and G. H. Humphries, joint liquidators, on winding-up.

Orders on Discharge

High Court of Justice.—Izzard, Robert Ernest, 276 Stamford Hill, N., trading as George Carpenter, radio dealer. Discharged as from August 17, 1944.

Intended Dividends

Nottingham.—Lee, Frederick, 28 Westgate, Grantham, motor and wireless dealer. Last day for receiving proofs, March 29. Trustee, Mr. A. J. Rogers, 22 Regent Street, Park Row, Nottingham.

CONTRACTS CLOSED OR RECOMMENDED

(Where it is stated that tenders are accepted by a Committee it will be understood that this is subject to confirmation.)

AIR MINISTRY.—Contract for over £500 for electrical work accepted in week ending March 4: **General Electric Co.**

METROPOLITAN WATER BOARD.—**H. J. Cash & Co.**, installation of mains, Lee Bridge, £177; **Smith & Hammond**, lighting installation, Eynsford, £112; **London Hoist & Machinery Co.**, electrically-driven, two-motor crab, for mounting on existing crane, £488.

WESTMINSTER.—Accepted by C.C. for one year: **Stearn Electric Co.** and **W. Geipel, Ltd.**, electric lamps, cables, etc.

COMPANY REGISTRATIONS

(Extracted from the Register issued by Jordan and Sons, 116-117 Chancery Lane, W.C.)

Fleming Radio (Developments), Ltd.—Capital £100. Subscribers: A. H. D. Fairbairns and Eleanor M. Cattell, both of 11 Sheffield Street, W.C.

Tanjon (Newcastle), Ltd., Exchange Buildings, Queen Street, Newcastle-on-Tyne.—Marine and general electrical engineers and contractors, etc. Capital £1,000. Directors: J. J. Tanner, 186 Hampton Road, Twickenham, Middlesex; R. W. Reynolds, 5 Savile Close, New Malden, Surrey; R. E. W. King, 6 Southway, Carshalton Beeches, Surrey.

Transalt, Ltd.—Manufacturers of refrigerating equipment, insulated and other rolling stock and vehicles, etc. Capital £5,000. Subscribers: A. H. A. Winfield and E. J. French, both of 2 Field Court, Grays Inn, W.C.1.

Medley's (West Bromwich), Ltd., 25 Spon Lane, West Bromwich.—Electricians, engineers, etc. Capital £2,000. Directors: A. Medley and Jessie M. Medley, both of 69 Dudley Street, West Bromwich.

Stage Electrical Equipment, Ltd.—Capital £4,000. Directors: H. J. Turner and E. M. Corvaja. Subscribers: H. H. Weil, Essex House, Essex Street, W.C.2, and Eileen Greenwood, 47 Aspinden Road, S.E.16.

Wright & Marks, Ltd., 83 High Street, Watford.—Mechanical, electrical and motor engineers, etc. Capital £1,000. Directors: A. Marks,

32 Hillbrow, Richmond, Surrey; G. Marks, 9 Embassy Court, Surbiton; H. Hodgson, 25 Upper Teddington Road, Hampton Wick.

R. C. Wallis, Ltd., 210 Field Road, Eastcote, Middlesex.—Radio and electrical engineers, etc., carried on at Eastcote by R. C. Wallis. Capital £500. Directors: R. C. Wallis & Mildred I. Wallis, both of 82 Elm Avenue, Eastcote.

Ryder Installations, Ltd., 247 High Street, Hounslow.—Manufacturers of and dealers in electric lamps, etc. Capital £1,000. Directors: C. C. Palmer, 32 Beverley Way, West Wimbledon; H. F. Minter, 44 Pangbourne Drive, Stanmore, Middlesex.

TRADE MARK APPLICATIONS

Amongst recent applications for British trade marks are the following. This information is extracted from the Official Journal by permission of the Controller.

J. E. Constable. 626535. Class 11. Electric lamps and electric lighting fittings. John Edwin Constable, 24 Hook Rise, Tolworth, Surrey.

Spyrobowl. B625897. Class 7. Centrifugal pumps. Harland Engineering Co., B.E.P. Works, Alloa.

Delco. 614468. Class 12. Shock absorbers, electrically-operated direction indicators, etc. General Motors Corporation, West Grand Boulevard and Cass Avenue, City of Detroit, U.S.A.

NOTES AND QUERIES

We are constantly receiving inquiries from readers on all sorts of matters. Technical questions are dealt with in Electrical Plant Problems and by Meghom. Most questions we are able to answer right away by letter or telephone, but occasionally we are at a loss. We shall be pleased to insert questions of this kind under the above heading in the hope that readers possessing the information will assist in the solution. Publishers' names are in brackets. Where samples are sent which it is desired should be returned the cost of postage must be prepaid.

(13352) "**Prometheus**" electric kettle, makers of? S.E.-L.—Dowsing Co. (Electrical Manufacturers), Ltd., Kangley Bridge Road, Lower Sydenham, S.E.26.

(13353) "**Maymore**" fires, makers of? R. & F.—May & Padmore, but the electrical section was acquired by W. T. French & Son, Ltd., Browning Street, Ladywood, Birmingham, 16, and 4 South Place, E.C.2.

(13354) "**Soutterlec**" electric kettle, makers of? G.S.P.—H. R. Soutter, Ltd., 19 Kensington Street, Birmingham.

(13355) "**Biobar**" soldering irons, etc., makers of? A. & S.W.—Bio Electrics, Ltd., 22 Pitt Street, Glasgow, C.2.

(13356) "**Wandsworth**" metal-clad double-pole switches, makers of? B.N.W.—Wandsworth Electrical Manufacturing Co., Ltd.; Imperial Works, Kenyon Street, Birmingham, 18.

(13357) "**Van Dorn**" and "**Holgun**" electric drills, makers of? W.E.C.—Black & Decker, Ltd., Harmondsworth, West Drayton, Middlesex.

(13358) "**Coldspot**" refrigerators, makers of? T.C.—Sears, Roebuck & Co., Ltd., 9 Wembley Hill Road, Wembley.

(13359) "**Penberthy**" sump pump made in U.S.A., English agents for? S.E.—W. H. Willcox & Co., Ltd., 95 Southwark Street, S.E.1.

(13360) "**Orel-Micro**" battery clocks, makers of? H.I. & T.—Orel Micro Electric, Ltd., but they have gone out of business. Enquiries should be addressed to E. Siegrist, Ltd., 39 Berners Street, W.1.

(13361) "**Uvral**" violet ray apparatus, makers of? S.—Buckley Bros., Beta Works, Riverside, S.W.15.

(13362) "**Tre Vita**" electric lamps, makers of? S.—Vitality Bulbs, Ltd., Neville House, Neville Place, Wood Green, N.22.

(13363) "**Zeros**" refrigerators, address for spares? N.M.-H.—Sterling Refrigerator Co., Ltd., Sterling Works, Dagenham, Essex.

(13364) **Linolite, Ltd.**, address of? M.V.—The Mill Works, Burnivale, Malmesbury, Wiltshire.

(13365) "**Bostik**" adhesive sealing compound, makers of? C.C.—Boston Blacking Co., Ulverscroft Works, Leicester.

MEETINGS TO NOTE

March 24.—Junior Institution of Engineers.—"Protective Devices for Electrical Machinery." R. J. Merralls.—39 Victoria Street, S.W.1.—6.15 p.m.

Mar. 24.—Illuminating Engineering Society (Birmingham).—"The Thyatron and its Applications," A. J. Maddock (Joint meeting with the Institute of Physics).—Imperial Hotel, Birmingham.—6 p.m.

March 24.—I.E.E., N.E. Students.—"Re-absorption of Ex-Service Personnel in the Post-war Engineering Industry," discussion.—Neville Hall, Newcastle-on-Tyne.—6.30 p.m.

Mar. 24.—Royal Institution.—"Lightning Calculations with Light," Sir Lawrence Bragg, O.B.E., M.C.—21 Albemarle Street, W.1.—5 p.m.

Mar. 24.—I.E.E., N.W. Centre.—Discussion "Wire v. Wireless Communications."—Engineers' Club, Manchester.—6 p.m.

Mar. 28.—I.E.E., Transmission Section.—Discussion on the Supply and Distribution Sections of the "Electricity Supply, Distribution and Installation," report by the No. 3 Post-War Planning Committee.—I.E.E. Building, Savoy Place, W.C.2.—5.30 p.m.

March 28.—Institute of Fuel and B.C.U.R.A.—Symposium on "Underfeed Stokers as applied to Electric Furnaces."—I.E.E. Building, Savoy Place, W.C.2.—10.30 a.m.-12.30 p.m. and 2.30-4.30 p.m.

March 29.—Inc. Soc. Br. Advertisers (Lanes. Sec.).—"Standardisation of Page Sizes in Trade and Technical Journals." E. E. Walker (Met.-Vick.). Luncheon meeting. Engineers' Club, Manchester.—12.45 p.m.

March 30.—I.E.E., Mersey and N. Wales (Liverpool) Centre.—"Industrial Fire Risks."—W. Fordham Cooper and F. H. Mann.—Liverpool Royal Institution, Colquitt Street, Liverpool.—5.30 p.m.

Mar. 30.—I.E.E., Cambridge and District Wireless Group.—"Transients on Transmission Lines" (illustrated by film), R. H. Angus.—University Engineering Department, Cambridge, 8.15 p.m.

Mar. 30.—I.E.E., London.—"Restriking-Voltage in Performance, Rating and Selection of Circuit-Breakers," J. D. Harle and R. M. Wilde; and "Influence of Resistance Switching on the Design of E.L.V. Air-blast Circuit-Breakers," H. E. Cox and T. W. Wilcox.—I.E.E. Building, Savoy Place, W.C.2.—5.30 p.m.

March 31.—I.E.E., Measurements Section.—Discussion meeting.—I.E.E. Building, Savoy Place, W.C.2.—5.30 p.m.

March 31.—Engineer Surveyors' Association.—"Oil Engines," C. J. Murray, Glasgow.—Institute of Engineers and Shipbuilders, Glasgow.