THE
ELECTRICIAN

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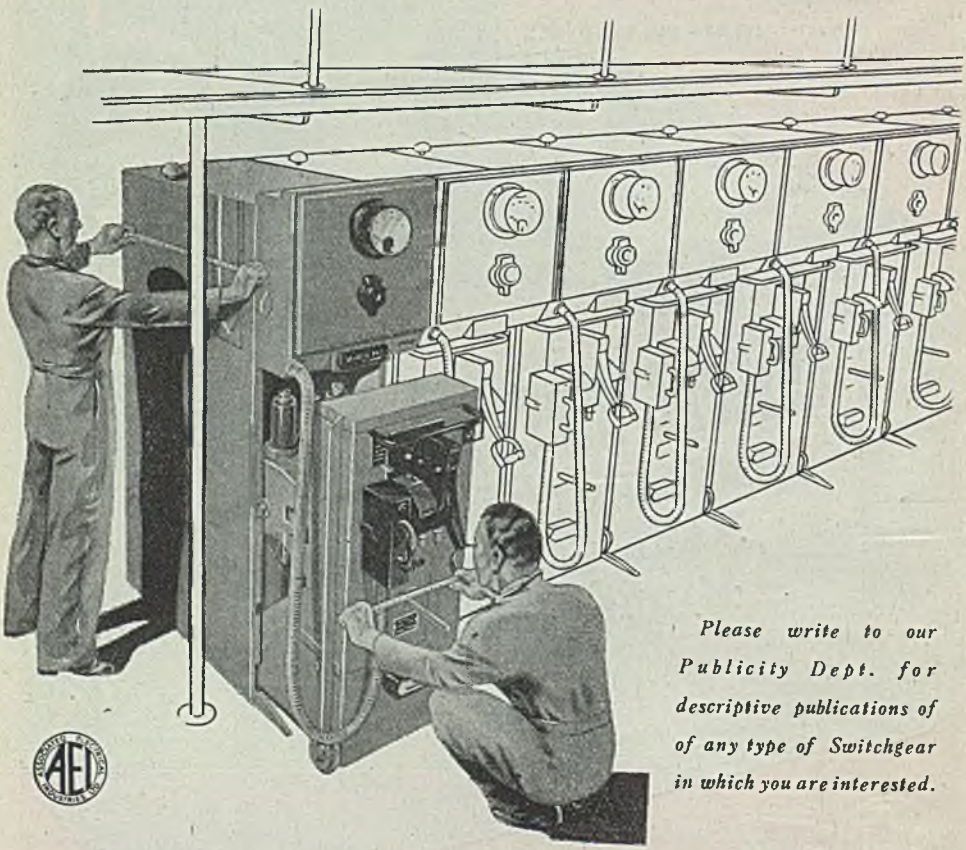

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SITUATIONS VACANT

ELECTRICAL Testing Apparatus and Equipment. Manager wanted for small high quality design and production plant, handling quantities up to 20 of a diverse range of test gear, which includes R.F.; not in London area. Knowledge of theory and practical ability to produce are essentials. Qualified engineer preferred. Excellent prospects for advancement in important business organisation for effective, industrious youngish, man of right character.—Write, stating salary required to: Box 7494, A.K. Advertising, 212a, Shaftesbury Avenue, W.C.2.

WELL-KNOWN CINEMATOGRAPH Circuit requires the services of a chartered Electrical Engineer. Must be capable of preparing plans and specifications of electrical installations for new theatre projects. Knowledge of modern plenum, heating and ventilating systems is desirable. Consideration will be given to applications from men due for demobilisation in few months' time. Replies which should give age and detailed particulars of applicant's career, salary, etc., will be treated in strict confidence.—Box L.P.P., "The Electrician," 154, Fleet Street, London, E.C.4.

A LARGE ENGINEERING ORGANISATION, wishing to contact a man of real ability in the design and development of fractional horse-power motors, invites communications from Electrical Engineers having a wide theoretical and practical experience in this branch of industry.

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CONTRACT NO. 705.

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Three 1 000 kVA. 11 200-3 300 volts, 3-phase, 50 cycles.

Contractors desiring to submit tenders may obtain Specification and Form of Tender at this Office on and after 30th July, 1945, on making a deposit of £2 2s. 0d., which sum will be refunded on receipt of a bona fide tender.

To meet the convenience of Contractors, two copies of the Specification will be furnished: additional copies may be purchased at a cost of £1 1s. 0d. per copy.

Any person or firm sending in a tender will be required to comply with the Standing Orders of the Council relating to the "Prevention of Corruption" and to the standard rates of wages and proper hours and conditions of labour. A print of the Standing Orders may be obtained from the Department.

The tender and accompanying documents, filled up as directed, must be enclosed in the official envelope supplied with the Specification, which shall not bear any name or mark indicating the sender, to be delivered to the Town Clerk, Town Hall, Sheffield, 1, not later than the first post on Monday, 27th August, 1945. Tenders received after the time stipulated herein will not be considered.

The Committee do not bind themselves to accept the lowest or any tender.

JOHN R. STRUTHERS,
General Manager and Engineer.

Commercial Street,
Sheffield, 1.
July, 1945.

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LEATHER FINGER STALLS.—Made of Chrome Hide. Very strong and hard wearing. Length 3 in. Price 4s. per doz. Prompt delivery. Sample on application.—Willson Brothers, Industrial Clothing Manufacturers, Epsom, Surrey.

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THE ELECTRICIAN

Established 1861. *The Oldest Weekly Illustrated Journal of*

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Midlands Office: Daimler House, Paradise Street, Birmingham. Telephone: Midland 0784.
Glasgow Office: 116, Hope Street, Glasgow, C.2. Telephone: Central 3970.

The Offices of THE ELECTRICIAN *are closed on Saturdays in accordance with the "Five-day Week" plan adopted by Benn Brothers, Ltd., and its associated publishing organisations. Until further notice the offices will be open between the hours of 9 a.m. and 5.30 p.m. from Monday to Friday.*

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CHIEF CONTENTS OF THIS ISSUE

The Installation Trade

THE remarks made by Mr. WALTER RIGGS last week, in his address at the annual meeting of the E.C.A., are of special interest at this time for the volume of work to be carried out by the installation trade in the next few years will, unless the industry is to suffer, need to be executed with some regard to the points raised. During the time when house building was at its peak between the last war and this, the electrical contractor was dogged by what became known as the jerry wireman; a person who, willing to employ unqualified labour, was prepared to wire houses on privately-promoted building estates at prices which if required to yield a legitimate profit, precluded the use of proper materials or safety of the installation over a reasonable number of years. This fact is generally well known throughout all sections of the industry, and was at the time a matter of serious concern. During the war years, with building at a standstill where house property of the type in question is concerned, the jerry wireman was forced to seek other fields of activity, and his dangerous habits have to some extent been forgotten. It is the business of the industry, however, to see that he is not given the opportunity of returning to his former haunts. The compulsory registration policy advocated by the E.C.A. and others is designed to bring this about, but there are many in the industry who view such an arrangement with disfavour.

When the Donkin Committee presented the case for compulsory measures, space was devoted by this journal to ventilating the opinions expressed, and though the views of readers on the subject were invited, only two letters resulted; indicating thereby a lack of enthusiasm to say the least. The E.C.A. and that organisation the National Register have, however, consistently supported some form of compulsion, but the little progress which has been made suggests that the industry prefers the maintenance of its individualism, and freedom of action for its operatives. That some check on the activities of the irresponsible wireman is necessary, is, nevertheless, generally admitted.

Coupled with the installation work which the forthcoming housing programmes will involve, is the question of trading and though the electrical industry, generally speaking, favours adherence to the rulings of the Fair Trading Policy, there have, nevertheless, in the past been transactions which represented a serious inroad into the distribution trade of the industry proper. Such transactions were, it is agreed, more often than not carried out by firms primarily concerned with another industry, and regarded electrical trading as a profitable side-line, as well it might be. While we appreciate the necessity to preserve free enterprise to the utmost, it must at the same time be borne in mind that unbounded freedom in electrical trading

without regard to the public interest is detrimental to the prosperity of the industry, and electrically speaking, that interest entails the after-sales service which only the legitimate electrical contractor is technically qualified to give.

Contractors' War-Time Experience

DISTURBED to an extent perhaps greater than has been any other trader, the electrical contractor has in many cases during the last six years not only lost his operatives, but many personal businesses were closed on account of military service, scarcity of supplies, the direction of the Ministry of Labour, and other causes, with the result that though the installation trade is fundamentally sound, there are some things in its house which need to be put in order. With a body like the E.C.A. to watch its interests, however, it is only a matter of time before the trade will be re-established in its pre-war form, for the annual report, which was presented to the association membership last week, shows that the Council have carried out their stewardship during the last six difficult years, with an understanding which promises well for the future. Good relations, which were maintained with the E.T.U., throughout the worst of the war years, and still exist, are based on an appreciation of the fact that the interests of the employee are identical with those of the employer, and any disturbance of either must of necessity influence the other. This spirit of partnership will, under the leadership of the new president, Mr. H. M. DRAKE, do much to overcome any difficult problems which the next few years may throw up, both in regard to labour and efficiency of the trade, and thus will the tempo of development be accelerated.

Progress of Electric Housing

IN our last issue comment was given upon the progress being made in the introduction of electricity in new housing, since when we are informed that the Birmingham Public Works Committee have decided that of the 4 500 temporary dwellings to be built in their area, fifty per cent. will be provided with electric cookers. There are also to be built in Birmingham, a number of permanent houses, the first 200 of which will be wired for lighting, and provided with 10 socket outlets, a fitted 1 kW fire in the main bedroom and wiring provision for a cooker, a wash-boiler and circulator. As gas piping is also being provided for the three latter purposes, individual tenants will be able to make their own choice of whether electricity or gas is to be used for these particular items, and their selection will be watched with interest. The wiring for the 10 socket outlets, which are 15 A, 3-pin type, and the fitted 1 kW fire consists of three separate circuits, each wired with 3/.036 cable and protected at the distribution board by a 15 A fuse. The number and grouping of points which are fed by each circuit have been arranged on the basis that the maximum load which can be reasonably anticipated on each circuit will not exceed 3 kW, having in mind the particular locations where the outlets are situated and the simultaneous use to which they might be put. Altogether, a very comprehensive arrangement.

Industry Tied by Red Tape

THE necessity for industry to be rid of the hindrances which prevent it preparing for post-war trade, has often been the subject of comment on this page, and confirmation of the views expressed was given last week by LORD DAVIDSON, president of the Engineering Industries Association. The Government, LORD DAVIDSON suspects, is not ready. Essential industries cannot recruit or even retain their workers, and this at a time when many men and women in certain factories have little or nothing to do. Members of the association cannot get started on civilian production because of controls. Admittedly many controls must continue for a time, but, says LORD DAVIDSON, there must be a process of sifting and simplifying. Contract settlements, the President went on, were tardy and restrictive; unless there was improvement, some engineering firms might find it difficult to pay wages. Government departments were two or three years behind with their cost investigations. Another obstacle was that, while export orders were flooding in, industrialists could not get going because of uncertainties about basic production required for the home market, about export restrictions or about foreign markets. Plans for new premises and new plant could not be put into operation because firms had no idea when funds would be available from E.P.T.

credits and war damage claims or what conditions would be attached to these payments. It is surely time some of this red tape can be cut away.

Lighting and the War Effort

THOSE in the industry who were, during the European war, engaged in the production of lamps, were often told that though their jobs were less spectacular than those concerned with the making of bombers, their work was none the less essential. How true, may be judged by the fact revealed on Monday, that because most of the R.A.F. bombing operations took place at night, a new method of illuminating the cockpit and instrument panels of aircraft had to be devised in order to prevent the pilot's vision being obscured by reflection. The system finally decided upon is now known as dual lighting, because two kinds of illuminant are employed, fluorescent lighting for instrument panels, and red lighting for the general illumination of the whole cockpit. The mechanical arrangements of the layout introduce, in part, the principle used in the so-called reflectionless shop window. The glass is so arranged that it reflects a black surface. The instruments are coated with a fluorescent paint which emits orange light when irradiated with ultra-violet radiation. The lighting generally, is red in colour, because of its monochromatic effect, and because red light does not impair a pilot's night vision, nor is it visible to an enemy some distance away.

American Factories in Britain

SOME indication of the type of competition which might be expected by the British manufacturer in the future was given last week at a luncheon of the American Chamber of Commerce, when Mr. WALLACE B. PHILLIPS, made known that the chamber had been inundated with demands from the U.S.A. and Europe for copies of a publication entitled "American Participation in British Industry," a re-issue of which had become necessary. This demand meant that more American firms were considering the possibility of embarking on new productive enterprises in Great Britain. If this be true it may mean that British-made goods will compete not so much against imported appliances, as goods made in this country to American design, and in that possibility lies a host of items for consideration. In the first place, assuming the goods referred to are electrical, it will be generally conceded that American made appliances of the portable type are not as a rule as robust as their British-made counterparts, and the thought arises whether or not the Americans will raise their standard in this respect. Finish of the completed appliance is another question, for though the British manufacturer has in most cases maintained a superiority in the matter of quality, the Americans have hitherto shown a strong inclination to give their portable appliances a finish which includes colours among its attributes. Whether such finishes would appeal to the British public, or whether any American manufacturer intending to start business here would adopt the customs of his British competitor remains to be seen, but the problem, meanwhile, is worthy of consideration.

War-Time Output of the T.M.C.

IN reviewing the war-time activities of the Telephone Manufacturing Co., Ltd., at the annual meeting, on Monday, Mr. FRED. T. JACKSON, chairman and managing director, was able to give some details of work in the telecommunications field, which, when translated into figures, is overpowering. For instance the company was responsible for the manufacture of no fewer than 1 300 000 microphones; 1 200 000 receivers; 920 000 telephone sets; 70 000 switchboards of all sizes up to 200 lines; while in addition, there were produced 11 500 000 condensers; 1 000 000 iron dust cores; 2 000 000 key switches; 2 500 000 plugs; 2 250 000 jacks; and 15 000 000 coils of various sorts involving the consumption of approximately 12 500 000 miles of wire. Mr. JACKSON also mentioned that the output of his company has grown from just under £1 000 000 to over £2 000 000 and the total output for the period 1940-44 amounts to £7 878 000. These are large figures and are the result of the production of an enormous range of equipment, some of which is still on the secret list. Mr. JACKSON also spoke appreciatively of the value of research which, after greatly assisting their war effort, was now being directed to the problems of post-war sales. As to the future, this is not in his view predictable for so much depends on the removal of controls before private enterprise can once more get busy.

Changing of Vector Reference

By G. L. d'OMBRAIN, Ph.D., B.Sc., A.M.I.E.E., D.I.C., A.C.G.I.

Below is discussed a method of changing the reference plane of a system of vectors expressed in Cartesian form.

Electrical calculations carried out with the aid of vector algebra give rise to various vector quantities all expressed to a common reference plane. When it is desired to express

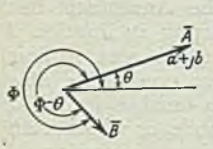


Fig. 1.

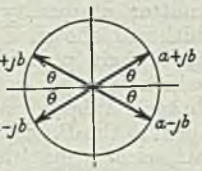


Fig. 2.

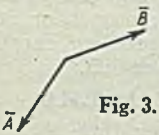


Fig. 3.

one of these vectors relative to another, resort is frequently had to finding the angle of each vector relative to the reference plane, thus finding the angular difference between the vectors; finally the sine and co-sine components are taken, thus obtaining the Cartesian components. The method to be described maintains intact the Cartesian character of the calculations without re-sorting to polar forms.

Consider two vectors such as A and B in Fig. 1, expressed in polar form as A/Θ and B/Φ relative to the common reference plane, both being positive angles, counter-clockwise rotation being reckoned positive.

Then B relative to A is :—

$$B/\Phi-\Theta \quad \ldots\ldots\ldots\ldots\ldots \quad (1)$$

This result is independent of the quadrants in which A and B may lie, provided that the angles Θ and Φ are measured in the manner described.

Equation (1) may be rewritten as—

$$B/\Phi-\Theta = B/\Phi \times 1/-\Theta \quad \ldots\ldots\ldots \quad (2)$$

Now consider Fig. 2, it will be seen that reversal of the quadrature term in any vector produces a new vector equal in magnitude but retarded by the angle by which the original vector was advanced, relative to the common reference plane.

Consequently multiplication of a vector A by a vector B with the quadrature term of B reversed will rotate A through an angle clockwise equivalent to the counter-clockwise angle of B relative to the reference plane. At the same time this operation will multiply the magnitude of A by the magnitude of B.

Therefore if A is multiplied by B with the quadrature term of B reversed and at the same time divided by the magnitude of B there will result a vector which is the original vector A rotated clockwise through an angle equal to the counter-clockwise angle of B relative to the reference plane.

The factor

$$\frac{a-jb}{\sqrt{a^2+b^2}}$$

can therefore be considered as an operator which rotates the vector it multiplies, through an angle Θ clockwise equal to the counter-clockwise angle Θ involved in the vector $a+jb$.

Expressed in polar form :—

$\frac{a-jb}{\sqrt{a^2+b^2}}$ is therefore equivalent to $1/-\Theta$ ..... (3)

Applying this result to equation (2) gives :—

$$B/\Phi-\Theta = B/\Phi \times \frac{a-jb}{\sqrt{a^2+b^2}} = \bar{B} \times \frac{a-jb}{\sqrt{a^2+b^2}} \quad \ldots\ldots\ldots \quad (4)$$

Equation (4) is quite general and is valid for positive and negative values of a and of b, hence it is immaterial in which quadrant the new reference vector or plane lies, provided that the operator has only the quadrature term reversed in sign. For example, if the new reference vector is $-a-jb$ relative to the common reference plane, then the appropriate operator is

$$\frac{-a+jb}{\sqrt{a^2+b^2}}$$

The results expressed by equation (4) can be given in the form of the following rule :—

If any vector of a system of vectors expressed in Cartesian form relative to a common reference plane is itself expressed as $a+jb$, then all the remaining vectors may be expressed in Cartesian form relative to this vector by multiplying them by

$$\frac{a-jb}{\sqrt{a^2+b^2}}$$

The original sign of a and of b being retained in the operator.

An example is two vectors A and B expressed as $-60-j80$ and $100+j30$ respectively relative to a common reference plane. Express the vector B relative to the vector A

According to the rule the vector B relative to A is :—

$$(100+j30) \times \frac{-60+j80}{\sqrt{60^2+80^2}} = \frac{-60-j18+j\,80-24}{} = -84+j62$$

Hastings.—The Electricity Committee is to provide supply to farms at Crowhurst, at a cost of £538; to Watts Place Cottage, Chitcombs at £360 and Shepherd's Farm, Peasmarsh at £80.

Institution of Electrical Engineers

Constitution of Council and of Section Committees, 1945-6

IN order to fill the vacancies which will occur in the offices of president, vice-presidents, honorary treasurer and ordinary members of the I.E.E. on September 30 next, Dr. P. Dunsheath was nominated as president, with Messrs. V. Z. de Ferranti, A. J. Gill and P. Good as vice-presidents; Mr. E. S. Byng was nominated hon. treasurer, and the ordinary members of council nominations were: Members (five vacancies), Messrs. * L. H. A. Carr, * J. G. Craven, * J. Eccles, * H. Faulkner, H. Pryce-Jones, * Prof. Willis Jackson; Associate Member (one vacancy), * Mr. J. M. Meek; and Associate (one vacancy) * Mr. A. F. Plummer.

* Nominated by the Council.

A ballot has been held and the scrutineers appointed at the ordinary meeting held on April 26 last, have reported the result as follows: *President*, Dr. P. Dunsheath; *Vice-Presidents*, Messrs. V. Z. de Ferranti, A. J. Gill, P. Good; *Honorary Treasurer*, Mr. E. S. Byng; *Ordinary Members of Council*, Members: Messrs. L. H. A. Carr, J. G. Craven, J. Eccles, H. Falkner, Prof. Willis Jackson; *Associate Member*: Mr. J. M. Meek; *Associate*: Mr. A. F. Plummer.

The Installations Section Committee nominations were Mr. Forbes Jackson as chairman, with Mr. J. F. Shipley, vice-chairman; Ordinary Members of Committee (five vacancies), nominations were Messrs. D. G. W. Acworth, R. Grierson, J. Hall, E. S. Hoare, J. F. Stanley.

No other nominations were received, and the above have been duly elected.

The Measurements Section Committee nominated Mr. S. H. Richards as chairman, with Mr. L. J. Matthews, as vice-chairman, while Ordinary Members of Committee (six vacancies), nominations were Messrs. D. C. Gall, J. Greig, F. J. Lane, H. S. Petch, G. A. V. Sowter, S. Whitehead.

No other nominations having been received, the above have been elected.

The Radio Section Committee nominations were Mr. A. H. Mumford, chairman; Mr. F. Smith, vice-chairman; Ordinary Members of Committee (three vacancies), Messrs. G. E. Condliffe, D. C. Esploy, C. E. Strong.

No other nominations were received and the above were elected.

The Transmission Section Committee nominated Mr. E. T. Norris as chairman, Mr. J. A. Lee as vice-chairman, and Ordinary Members of Committee (four vacancies), Messrs. S. E. Goodall, * P. W. Laverick, * J. McCombe, * H. Payn, * P. J. Ryle.

* Nominated by the Section Committee.

A ballot was held and the scrutineers appointed at a meeting on May 30 last, have reported that Mr. E. T. Norris has been elected chairman; Mr. J. A. Lee, vice-chairman; and Ordinary Members of Committee, Messrs. S. E. Goodall, J. McCombe, H. Payn, P. J. Ryle.

Dr. Percy Dunsheath

Dr. Percy Dunsheath, director and chief engineer of the W. T. Henley's Telegraph Works Co., Ltd., who has been elected to the Presidency of the Institution of Electrical Engineers for 1945/6, has made several important engineering contributions to the war effort, one of the most outstanding being the development of buoyant cables for sweeping magnetic mines, utilising cylindrical "tennis balls" to form the buoyant centre of the cables. It is of interest to record also that Dr. Dunsheath was the pioneer of the continuous extrusion process for producing led pipe and the inventor of the first machine to operate successfully on this principle.

Dr. Dunsheath, I.E.E. President, 1945-46

Born at Sheffield in 1886, Dr. Dunsheath entered the University of Sheffield and was awarded an Associateship in Engineering and the Mappin Medal in 1908, at the same time gaining University of London 1st Class Honours B.Sc. in Engineering. Subsequenty he took the Mechanical Science Tripos at Cambridge University and was awarded a First. His first appointment on leaving college was assistant engineer in the engineer-in-chief's office of the General Post Office.

During the 1914/18 war he served in France as a Captain in the Royal Engineers, commanding a Telegraph Construction Company, and being responsible for several large communications systems, including one for the Independent Air Force in the Vosges. For those services he was twice mentioned in

despatches, and was awarded the O.B.E. (Military).

Dr. Dunsheath has had a distinguished career with W. T. Henley's Telegraph Works Co., Ltd. Joining the company in 1919 for the purpose of reorganising the research department, he has been responsible for many improvements in the design and manufacture of electric cables, particularly in the super-tension field, and in 1924 was awarded the Medal of the Royal Society of Arts for a paper on "Science in the Cable Industry."

He became a full member of the Institution of Electrical Engineers in 1921 having been an associate member since 1912.

In 1927 he visited the United States as a delegate of the International Electro-Technical Commission, and has served on many technical committees, both British and International. He was appointed research and technical manager of Henley's in 1929.

He gained his M.Sc. (London) degree in 1932, and in 1933 the degree of Doctor of Science in Engineering, London University, was conferred upon him.

Directorships

In 1934, Dr. Dunsheath was appointed chief engineer of Henley's Telegraph Works Co., Ltd., and was elected a director of the company and of its subsidiaries, Henley's Tyre and Rubber Co., Ltd., and the Holborn Construction Co., Ltd., in 1937.

He has held office twice as Member of the Council of the I.E.E., serving as chairman of the Transmission Section 1936/37, and as vice-president 1940/43. In 1942 he was appointed chairman of the Research Committee which office he still holds, and was re-appointed vice-president in May 1945. He has been awarded the Kelvin Premium, the John Hopkinson Premium, and various Extra Premiums.

Educational Interests

His interests in the many important problems of education, particularly so far as they relate to industry, are well known With the Henley organisation he initiated some years ago a comprehensive Education Scheme for junior employees, and, as evidence of his interest in a wider field, he is vice-chairman of the Governors of Woolwich Polytechnic, a member of the Council of the British Association for Commercial and Industrial Education and of the Standing Committee of Convocation of London University.

Among the many engineering and scientific bodies with which Dr. Dunsheath is associated are included the Institution of Civil Engineers (Member), the Physical Society (Fellow), the Institute of Physics (Founder Fellow), F.B.I. Research Committee (Member), Royal Institution (Vice-President 1945).

He is the author of many papers and articles on electrical engineering, physics, the organisation of research and education in industry. His hobbies are mountaineering and music, and his club, the Athenæm.

Electrical Exhibition in Village Hall

AN electrical exhibition arranged by the Northmet Power Co. was held in the Village Hall, Hexton on July 20. The exhibition included a display of electrical apparatus for use on the farm and in the home. The farm aparatus included an electric welder, milking machines, farm sterilizer, churn stool, washing tank, a model of the Essex mill, a model made by Geo. King of Hitchin illustrating grain drying, conveying and storage, a plant irradiator, soil heating cable, greenhouse heating etc., and for the home a display of cookers washing machine, wash boiler, water heater, kettles, irons, etc.

The whole display was very well attended, particularly during the evening, and special interest was shown by the local inhabitants of Hexton and the surrounding villages.

The exhibition was opened by Sir Patrick Ashley Cooper, who said that he deprecated the verbal heat which had been wasted with respect to electrification in rural areas. It had for years before the war been accepted as a most necessary development and but for the war great progress would, no doubt, have been made; when the Japanese war was over the pace of development would, however, quicken.

There were municipal undertakings and there were private enterprise companies, They each had certain advantages, but fortunately in Hexton they did not waste time in arguing about them. The estate was served by both the Luton Corporation and the Northmet Company and good service was offered by both. If we were to be critical at all, it should not be of the undertakings but of ourselves. None of us really made full use of the services which were offered. In places like America and Canada the people not only used all the appliances offered but they demanded more. Several of the local farms used electricity, but not nearly enough.

Mr. C. R. Marshall (area superintendent), in thanking Sir Patrick said it was not an easy matter in these days to stage an exhibition, but he thanked those manufacturers who had co-operated so wholeheartedly.

Mexico as Post-War Market

A Review of Electrical Opportunities — U.S.A. as Favoured Nation

THE Department of Overseas Trade has published its Review of Commercial Conditions in Mexico (Stationery Office, 1s. net), and in this it is pointed out that the war has accelerated industrial development in that country, but there has been no change in the policy of economic nationalism. Many new industrial enterprises have been formed, among them being the establishment of a blast furnace with a daily capacity of 500 tons of pig iron and a blast furnace and rolling mill with a total output of rolled products estimated at over 100 000 tons a year. Factories producing, among other things, fluorescent electric lamp bulbs, have also come into operation. While Mexico is unlikely to attain complete self-sufficiency in many of the manufactures which have grown up since the war it is probable that in due course certain manufactures will no longer be imported.

Hydro-Electric Developments

There has been considerable development in recent years of hydro-electric power, for which conditions are naturally favourable, but both coal and oil-fired thermal generation is also widely used. Of the installed capacity in 1939 about 60 per cent. consisted of hydro-electric plant. There is considerable potential capacity still undeveloped. At the end of 1939 there were 173 generating plants in operation, the majority of which were located in the States of Michoacan, Mexico, Vera Cruz, Puebla and Chiapas. The total production of energy in that year amounted to 2 457 million kWh compared with 1 833 million kWh in 1934. By 1943 production had risen to 2 724.9 million kWh, of which 2 248 200 were generated for public and 4 767 000 for private services. This total does not include a further 13½ million kWh generated by small plants of less than 50 kW capacity, both for private and public consumption. Seventy-one per cent. of the total consumption of Mexico is consumed in the Central States, and 38 per cent. of the total in the Federal District itself, including Mexico City.

A Federal Electricity Commission was created in 1937 to intensify electricity output and large plants are being developed in the Federal District, in the States of Mexico, Puebla and Vera Cruz, and at Torreon in Coahuila. The most important of these undertakings is at Ixtapantongo in the State of Mexico, where the first of three plants, each of 30 000 kW capacity, was inaugurated in September, 1944. It had been originally planned to instal machinery imported from Europe, but when the war made this impossible, machinery was obtained from the U.S.A. in order not to hold up the scheme indefinitely. A 25 000 kW thermo-electric plant was put into operation at Nonoalco, close to Mexico City, by the Mexican Light and Power Co. in June, 1944, thus relieving, temporarily at least, a difficult situation which had arisen owing to the very rapid growth of Mexico City itself, and of industry in the Federal District. The previously existing generating plants had been unable to meet the demand for current when water was low at the end of the dry season, and a 20 per cent. reduction in all consumption in the central states was imposed for three months early in 1944, before the rains began.

It is estimated, however, that the demand for power in the Federal District and the State of Mexico is increasing at the rate of 25 000 kW per annum, and it is difficult for the supply to keep pace with the demand. Various other generating plants are under construction in different parts of the country, in addition to those mentioned above. These schemes, when completed, are expected to provide increased capacity amounting to 500 000 kW, of which 277 000 kW will be derived from water power, 191 000 from coal and 32 000 from Diesel-electric generators. The annual cost of these developments, which are planned to cover a ten-year period, is estimated at about £1 500 000 for power installation, plus a further expenditure of about half that sum for transmission lines.

Rise and Fall of Electrical Exports

United Kingdom exports to Mexico showed a steady downward trend in the years before the war, with the commendable exception of electrical goods. In this field, imports from this country rose from £11 400 in 1937, to £17 600 in 1938; in 1939 however the figure fell away to £13,200. In 1940 there were 28 electrical manufacturing organisations, employing 566 operatives, while electrical generating stations employed a further 7 108 operatives.

It seems likely that the general effect of the war will be to increase the purchasing power of the higher income groups in the country, while leaving that of the lower income groups relatively unaffected. Of the total population of 20 millions, not more than four millions, at most, purchase a wide range of manufactured articles, and

it seems likely that after the war the market for imported goods will be largely the same in kind as before the war, though the market will have a greater purchasing capacity and imported goods may require to be of higher quality in order to compete successfully.

Mexico has made important contributions to the war effort by her provision of manpower, represented by the workers who have found temporary employment in the southern part of the U.S.A. and by development, with the assistance of the U.S.A., of her resources of raw materials, and in a lesser degree of certain manufactured articles and foodstuffs, the production of which in the U.S.A. has been limited.

With increased purchasing power in the hands of Mexican customers, some of the industries which lose their temporary foreign markets may be able to dispose of their production within Mexico, but this alternative market, whilst it may prevent internal dislocation and should in any event bring down internal prices from their present level, may still further reduce Mexico's capacity to buy abroad. These various factors may be expected, even if they provoke no internal crisis, to reduce Mexico's foreign purchasing power, so soon as the accumulated balances of dollars have been spent. The degree to which this purchasing power will be restored depends to a great extent upon the U.S.A. silver policy, and on the discovery of possible alternative markets for Mexican silver and other metals, which will no longer be in such keen demand after the war. In the long run, however, the various measures which have been taken during the war to develop new industries and particularly electric power production (which has long been a limiting factor on industrial expansion) should enable Mexico to correct the immediate post-war decline in the value of her exports.

Control of Imports

Powers have been granted to the Minister of Finance to control the import of any goods whenever necessary, in order to prevent the expenditure of the accumulated dollar reserves on non-essentials, and to direct foreign spending, so far as possible, into productive channels. These powers have been used, so far, solely to assist in a campaign to reduce internal prices, and there is no indication yet as to the manner in which they will be applied to achieve their proposed object. Provided, however, that they are exercised effectively, the "metallic reserves," equivalent respectively at the end of 1943 and 1944 to about 24 and 30 million pounds, should suffice to cushion the fall in the receipts derived from exports. Subject to this proviso, and provided that no serious labour problems arise, it seems unlikely that Mexico will be faced with serious economic difficulties for the first two or three years after the resumption of normal trade.

Immediate post-war requirements of semi-consumer, semi-capital domestic goods which are imported or assembled locally, such as domestic refrigerators, etc., are expected to exceed pre-war demand, but in view of the strong position of the U.S.A. in the market, it is probable that this class of goods will be supplied almost entirely from the U.S.A., unless other foreign manufacturers find it profitable to arrange for assembly in Mexico.

Capital Goods

In the field of capital goods, there is likely to be, in view of the difficulty of obtaining machinery during the war and in the absence of local production, a considerable demand in the immediate post-war period for equipment of all kinds, not only for industry, but for agriculture, the oil industry, and the railways, as well as in connection with public works contracts. The mining industry is also in need of new, modern equipment, but it is doubtful whether the industry as a whole has been able to accumulate the necessary capital reserves during the war. Mexico's long term requirements of capital goods appear likely, therefore, to exceed the scale of her pre-war imports.

Whilst improvements to the country's communications have been carried on so far as possible during the war, projects for electrification and irrigation have been partly suspended: these are already receiving urgent consideration again.

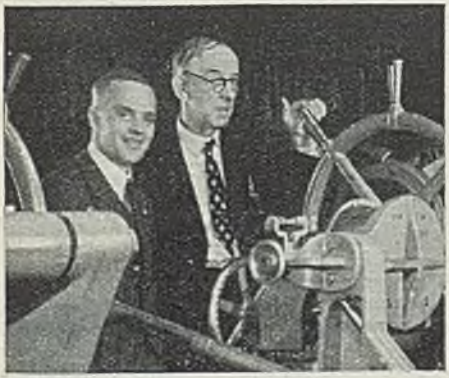
Obviously the proximity of the U.S.A. and the close economic relations between Mexico and that country will mark out the U.S.A. as the principal source of supply for many of Mexico's requirements, but the greatly increased industrial capacity of Canada, and the growth of her trade with Mexico during the war, suggest that an increasing share of Mexico's imports will be derived from that source. Nevertheless, there would still appear to be ample room for increased sales of United Kingdom goods in Mexico, on a competitive basis, especially for those classes of goods which were formerly supplied from Germany and for those which fall outside the range of U.S.A. or Canadian production. Europe in general (and the United Kingdom in particular) is normally a buyer of many Mexican raw products that cannot, because of similarity to their own products, be purchased by the U.S.A., and there is little reason to foresee Anglo-Mexican trade flowing in one direction only.

Electrical Personalities

We are always glad to receive from readers news of their social and business activities for publication in this page. Paragraphs should be as brief as possible

The Brush Electrical Engineering Co. Ltd. recently held a sales conference, and the photograph reproduced shows a corner of the room with the conference in progress under the chairmanship of **Mr. D. B. Hoseason.**

Mr. James Andrews, who for 47 years has been closely associated with the design



Mr. G. Whitehead (left) and Mr. J. Andrews at one of the cable laying equipments supplied for "Operation Pluto"

and production of the equipment that made possible the laying of the "Hais" cable for the famous "Operation Pluto," has retired from Johnson and Phillips Ltd. His retirement was due to come about two years ago, but because of the "Pluto" operation, Mr. Andrews by reason of his intimate knowledge of the machinery required, stayed on. The story of the cable-laying equipment for the operation, has already been told in THE ELECTRICIAN, In the works' canteen on July 10, Mr. G. Whitehead, production engineer, presented a gold wristlet watch, suitably inscribed, to Mr. Andrews, on behalf of the departmental managers of the company, the staff and the workpeople. He had previously been presented with a cheque by the executive directors of the company. Mr. S. Simmons expressed the good wishes of all members of the maintenance department, and on behalf of the foreman, Mr. J. Cooper, who has also 49 years' service with the company, wished their old friend every good wish. Mr. W. Smith, who up to quite recently was the Hon. Secretary of the J. & P. Sports Club, also spoke. Mr. Andrews has been awarded a pension by the company in recognition of his long service.

Mr. J. H. Aston, of Tube Investments Ltd., has resigned from the board of Stewarts and Lloyds Ltd. **Mr. P. G. Carew,** also of Tube Investments Ltd., has been appointed a director of Stewarts and Lloyds Ltd., in place of Mr. J. H. Aston.

Blackburn Electricity Committee has placed on record appreciation of the services of **Mr. J. B. Ashworth,** consumers' engineer, who has taken up a similar post at Preston, and **Mr. O. W. Hives,** chief clerk and commercial assistant, who has retired on superannuation for health reasons.

It is announced by Oliver J. Nilsen and Co., Pty., Ltd., of Melbourne, that **Mr. Eric L. Cottrell,** who has been, for many years, secretary of the company, and **Mr. Joseph McGaw,** manager of its engineering workshops, have been appointed financial and technical directors, respectively. Mr. Cottrell is the financial director of Nilsen Cromie Pty., Ltd., manufacturers of the Federal switchgear, and of Nilcrom Porcelains (Aust.) Pty.,

Group taken during the sales conference of the Brush Electrical Engineering Co., Ltd., with Mr. D. B. Hoseason in the chair

Ltd. He will also become financial director of Oliver J. Nilsen and Co., Ltd., of Adelaide, while Mr. McGaw will become technical director of Nilsen Cromie Pty., Ltd., Nilcrom Porcelains (Aust.) Pty., Ltd. and of Oliver J. Nilsen and Co., Adelaide. As a point of interest Mr. Oliver J. Nilsen is governing director of Nilsen's Broadcasting Service Pty., Ltd.—3 UZ, which

Mr. E. L. Cottrell

Mr. J. McGaw

was the first commercial radio station to operate in Victoria.

The marriage took place on July 19, at St. Peter's, Tandridge, Surrey, of Mr. Albert Edward Louis Mash, of The Weald, Betchworth, son of Mrs. A. Mash, of 96, Manor Road, Mitcham, and Miss Julia Wedgwood Benn, younger daughter of Sir Ernest and Lady Benn, of Morven, Oxted. Canon R. H. Cragg and the Rev. H. B. Denison officiated.

Mr. C. J. F. Geraghty has been appointed as charge engineer at Islington.

Mr. A. P. MacAlister, borough electrical engineer at Islington, whose services have been extended beyond his 65th birthday, has now intimated his intention to retire at the end of the year.

Mr. H. M. Fricke has taken over the duties of branch manager in Birmingham for Johnson and Phillips Ltd., owing to the protracted illness of **Mr. D. C. McLennan.** Mr. Fricke was educated at Dulwich College and University College, London. He joined Johnson and Phillips as a student-apprentice in 1924 and was transferred to Birmingham in 1927; he is already well known in the Midlands.

On July 18, Hilary Jill, the only child of **Flight-Lt. G. A. T. Burdett,** a regular contributor to this journal, died at the age of six years, following a sudden operation.

A tablet to commemorate the work of the late **Sir William Bragg, O.M.,** and of his son, **Prof. Sir Lawrence Bragg,** presented by Mrs. Smithells, widow of Prof. Arthur Smithells, was unveiled by Prof. R. Whiddington, F.R.S., at Leeds University on July 20. The tablet states: "Near this place in the old Physics Laboratory in the year 1913 William Henry Bragg, Cavendish Professor of Physics in this University from 1909 to 1915, and his son William Lawrence Bragg, began their joint researches and established with the first X-ray spectrometer the nature of X-ray spectra and the principles of crystal analysis for which they were awarded the Nobel Prize in 1915."

Sir John Dalton, who has been Fuel and Power Controller for London and South-East England during the war years, has asked the Minister of Fuel and Power to release him in order to return to the County of London Electric Supply Co.

Mr. Burt J. Nutt, northern manager of the Sturtevant Engineering Co., has been elected president of the Manchester Rotary Club.

Obituary

Mr. A. R. Bellamy, aged 83 years, a director of Ruston and Hornsby Ltd.

Mr. Bernard Shire, on July 4, aged 68 years. He had been with the G.E.C. for 42 years and received his technical training at Karlsruhe University. After works experience he went for a time to South Africa, and returning in 1903, he joined the staff at Witton Engineering Works, where his later attention was mostly devoted to the preparation of tenders for contracts.

Mr. Bernard Shire

Mr. F. G. B. Hill, on July 22, aged 58 years. He received his technical training at the Polytechnic. After practical experience in London, he joined the Lahmeyer Electrical Co. in 1907, and when that company was absorbed by the A.E.G. Electric Co., Mr. Hill was appointed principal assistant to the manager at Manchester, in 1910, being engaged, principally, on the electrification of cotton mills. In 1913 he went to the electrical works of the A.E.G. at Bangkok, Siam, as assistant engineer. Returning to England in 1914, he joined the Army, until in October, 1919, Mr. Hill joined the British Thomson-Houston Co., Ltd. After three months, he was put in charge of the motor and control gear section of the export department; and later, when some re-organisation of departments took place, he was appointed manager of the industrial control sales department, dealing with both home and export business.

Correspondence

The Editor welcomes the free expression in these columns of genuine opinions on matters of public interest, although he disclaims responsibility alike for the opinions themselves and the manner of their expression.

Return of Cable Drums

[To The Editor]

Sir,—The difficulties which cable-makers have experienced in obtaining adequate supplies of cable drums still continue.

Timber shortage is still acute and it is likely to remain so for a long time, with a very restrictive effect upon the manufacture of new drums. It is feared that a serious bottleneck is likely to develop as soon as cable production for reconstruction gets once more into full swing, unless cable users make drastic efforts to " keep the drums rolling " by emptying and returning them to their suppliers at the earliest possible moment. This would help to speed up cable deliveries considerably.—Yours faithfully,

T. F. Purves.

Director, Cable Makers' Association.

Earth Leakage Trips

[To the Editor]

Sir,—May I encroach on your limited space to reply to " Supervisor."

The choice of titles for electrical apparatus is not always descriptive of their technical functions, in that they are often chosen as in this case, to distinguish types. Voltage-operated is technically wrong and is a contradiction of Ohm's Law.

A better title in my opinion would be :— " Earth Leakage Voltage Limiting Trip." The case of a voltmeter is not a true parallel, and the amp-turns have to be taken very seriously into account if the voltmeter is to be used for radio work. The extreme case of heavy earth fault pre-supposes that the conduits, etc., are very solidly earthed, and in this case I should not expect a leakage trip of this type to work at all.

Regarding the separate electrode, it would call for a nicety of judgment, in such a case, to place it outside the fields of all the separate potential gradients surrounding the connected metal. If both forms of protection are adopted, the trip can only be regarded as a second line of defence in case the solid earthing becomes wholly or partially disconnected, so the precautions as to fuses, etc., should be observed.

In my opinion the earth-leakage trip is wasted in urban and suburban districts, in that its most useful field of application is in rural areas, where low resistance earths are difficult to obtain and where the items to be protected are usually well separated, so that each can be provided with its own trip; preferably used as the normal means of interrupting the supply, and a separate electrode.

On the Continent leakage trips are used with a separate electrode, chiefly because metalclad systems of wiring are not favoured and so local earth points have to be provided.

Frankly, I do not understand " Supervisor's " reasoning. He admits that faults arise by carbonisation, but imagines that current does not flow until after what he calls " the moment of contact between phase and earth " which, I suggest, does not happen in 90 per cent. of earth faults.

Carbonisation is, in most cases, a gradual process and would eventually pass enough current to work a leakage trip, long before the stage when flash-over would occur.

The question of whether, in the case of metal to metal contact, the voltage on the framework will approach or equal the full supply voltage, will depend on the particular thousandth of the second on which contact occurs and perhaps the phase angle, if we must introduce transients.

My figures for the coil resistance were just a matter of Ohm's Law, complying with the maximum figures suggested in the regulations, and the d.c. case for simplicity. I agree that " Supervisor's " figure of round about 300 megohms is usual, but whether you take 300 or 500 it does not affect the matter under discussion.

I suggest that " Supervisor " rereads the latter part of the paragraph which I quoted from his previous article and explain if his contention is correct, i.e., that the full voltage appears at the " moment of contact," why the trip does not work instantaneously instead of waiting for " the requisite potential to appear " due to excess current and the delayed action of the fuse.

Yours faithfully,

Newcastle. S. Cooper.

Electricity Supply, Southgate

[To the Editor]

Sir,—In the notes on this subject appearing in your issue of July 20, it is stated :—" It is understood that the conferences have been convened by the Joint

Electricity Authority at the request of the Electricity Commissioners and the Ministry of Fuel and Power in order that a post-war reconstruction scheme might be evolved and better distribution of electricity obtained."

In order to avoid any misunderstanding, it should be made clear that the conferences to which reference is made in the note have been called with the knowledge, but not at the "request" of the Electricity Commissioners or the Ministry of Fuel and Power. The Minister, in November, 1944, indicated, on the general question of the exercise or non-exercise of purchase rights in the London and Home Counties Electricity District, that he was fully aware of the great importance of the subject, and that full regard was being given to it in the Government's consideration of the re-organisation of the electricity supply industry.

Yours faithfully,
LESLIE GORDON,
Clerk and Solicitor,
London and Home Counties J.E.A.

Export Trade Expansion

Survey of Markets by the B.E.T.R.O.—Council Members

FIFTY leading personalities in British commercial life, representing firms with a total capital of several hundred millions, met last week to put into operation the recently formed British Export Trade Research Organisation, which 99 founder and 112 ordinary member firms have already joined.

The chairman, Mr. Ivor Cooper, said in his address that the strength of founder membership showed that the inception of the B.E.T.R.O. had been regarded by industrial leaders as right and necessary. "We are here," he said, "because we believe that our foreign trade must be based on accurate and continual market surveys. Major tasks await the council. These are the recruitment of skilled staff to carry out this new science of market research; the detailed set-up of the operational side of the organisation; its relationship with trade associations, export groups, and others, many of whom have asked to be affiliated and who, we hope, see in organisation the means of increasing the export trade of their members."

Mr. Cooper expressed thanks to those who had supported the founding of the organisation, including the Advertising Association and Incorporated Society of British Advertisers, and also the daily and trade Press.

Mr. M. A. T. Johnson (Richard Johnson and Nephew Ltd.) said he considered it of the greatest importance that every firm of any standing in the export trade should join the organisation, and Mr. Arnold Jackson suggested that industry should provide the organisation with from £300 000 to £500 000 a year to carry out its work.

Representatives of the firms who were elected to the Council include:—Mr. Leslie Gamage (General Electric Co. Ltd.), deputy chairman; Mr. F. C. Burstall (Automatic Telephone and Electric Co. Ltd.); Lieut.-Col. L. J. Barley (Imperial Chemical Industries Ltd,); Mr. C. P. Lister (R. A. Lister and Co. Ltd.); Major A. Pam (Pressed Steel Co. Ltd.); Mr. L. G. Abel (Vickers-Armstrongs Ltd.); Mr. C. K. F. Hague (Babcock and Wilcox Ltd.); and Sir Edward Wilshaw, (Cable and Wireless Ltd.).

Mr. Philip Scott, who has been acting as organiser for the Formation Committee expressed his wish to devote himself to oversea development. Mr. Arthur Ethell, who has been released by the Air Ministry, was appointed as Director of Administration.

RESEARCH IN INDIA

Lord McGowan has written to Prof. Wadia, president of the National Institute of Sciences of India, offering on behalf of I.C.I. (India) a number of research fellowships for the encouragement of Indians in chemistry and physics to be held at Indian universities and institutions. The sum offered is 336 000 rupees—equivalent to £25 200—over the next five to seven years.

In his letter to the National Institute Lord McGowan states:—

"The National Institute of Sciences is, we believe, destined to play in India, a part similar to that which the Royal Society of London has performed for nearly 300 years in leading the scientific progress of this country. The Royal Society until recent years was hampered by lack of funds and provision for the maintenance of scientific workers. This difficulty was eventually overcome by the generosity of various benefactors, including industrialists such as Mond and Messel. We thought, therefore, that there could be no better way of encouraging the advance of science in India and with it the general prosperity of the country than by the offer of these fellowships."

Each fellowship will be worth 400 rupees a month and will be tenable in the first instance for two years.

News in Brief

Street Lighting Contract.—The Newbury Lighting Committee recommends a contract with the Wessex Electricity Committee for street lighting for 10 years at £1 358 18s. per annum.

Hull Telephone Profits.—It is stated that the Corporation's telephones, the only municipal undertaking of its kind in the country, show a surplus on the year ended March 31 of £32 918, which is £5 680 more than was estimated.

I.E.E. Devon and Cornwall Sub-Centre.—In the report of the Committee for the session ending September, 1945, it is stated that the attendances at all the meetings have been gratifying, the total membership being 248.

Consulting Engineer Appointment.—The Metropolitan Water Board is to appoint a consulting engineer to report on means for improving the heating at the Board's offices.

Reading Street Lighting.—Whilst most cities and towns in the provinces have reverted to pre-war lighting, Reading has returned to a complete black-out. The lamps were converted to full lighting when the order was issued permitting the full resumption of lighting, but in response to the appeal from the Ministry of Fuel to economise, the Highways Committee has decided not to light up until early September.

Damage to Street Lamps.—At a meeting of the Swanscombe General Purposes Committee the clerk read a letter from the Kent Electric Power Co. referring to the wilful damage to street lamps and pointing out that it was becoming increasingly difficult to maintain a supply to these lamps as they were consistently being broken, and reflectors had been rendered useless, the Council were asked to take steps to mitigate this trouble. It was decided to inform the company of the steps being taken to deal with the evil.

Liverpool Transport Schemes.—Mr. G. W. Armour, chairman of the Liverpool passenger transport department, stated recently that while his committee were fairly unanimous in thinking that trams in the road were an anachronism which they should aim at abolishing, they considered a dual system of buses and electric coaches running on light railways in enclosed tracks with modern rolling stock, would enable fast and effective services to be provided.

Blackpool Lighting.—For the first time since the war the lighting on the promenade and main roads was restored on a peacetime basis on July 18.

Electric Farming in Wales.—Col. Rankin, general manager of the North Wales Power Co., in an address to the Denbighshire branch of the National Farmers' Union, said the company was out to encourage farmers to use electricity, and an extensive survey was being made so that schemes could be prepared.

Employment of German Prisoners.—The Liverpool Electric Power and Lighting Committee is asking the City Council to sanction the City Electrical Engineer making arrangements for the employment of German prisoners on the laying of cables in connection with the destribution of electricity, and to supply temporary houses under prescribed conditions.

Comrades' Service Association.—The Brookhirst Comrades' Service Association (incorporating Cantie Switches Ltd.), has decided to send P.O.'s for 10s. to members of the forces serving overseas, and 5s. to those on home service. The association maintains contact with 460 men serving overseas and at home.

Railway Electrification Proposals.—When addressing the Manchester District Traffic Association recently, Mr. Ellis Smith, M.P., advocated a wide extension of electrified railway systems in the North. There should be planned and constructed, he said, an electrified inner railway circle covering a radius of 10 miles of Manchester, which should be linked up with other electrified systems extending from Liverpool to Sheffield and Leeds and from Preston to Chester and Stoke-on-Trent, with radial lines serving places like Blackpool, Southport, Fleetwood, the Lake District, York and Hull. Electrification of the railways from 1928 to 1938 applied mainly in the South. In his view, it should have taken place in the North.

TWENTY-FIVE YEARS AGO

FROM THE ELECTRICIAN *of July 23, 1920: The Machine Tool and Engineering Exhibition, which will be held at Olympia in September next was to have been held in 1916, but on account of the war was postponed. The first exhibition was held in 1912, and the fact that eight years have elapsed since the last exhibition of machine tools in this country will mean that more new models and new types will be on view than have ever been shown at any previous exhibition. The whole of Olympia has been booked up for some months past, and the number of separate exhibitors will exceed 200.*

Electrical Contracting Industry

E.C.A. Annual Report — Compulsory Registration

THE report of the Electrical Contractors' Association was presented at the annual meeting on July 18, when in the course of his address, Mr. Walter Riggs, president of the E.C.A. and allied associations, said that this was the eighth occasion upon which he had appeared as president, and in presenting the report it would be the last one he would be privileged to deliver. He had continued to act as president for the period of the war simply because it had been represented to him that it was the wish of the membership that he should do so; that it was his duty to ensure a measure of continuity during the dark period of the past 5½ years; and that he could in some small way give service to the membership as a whole and to the industry of which the association represented a component part. The time had now arrived for him to hand on the responsibility of office to Mr. H. M. Drake, who had been elected by the Council to serve as president for the ensuing year.

Mr. Walter Riggs

The year covered by the report had been one in which the association had been invited, not only by the Government, but by the progress of the European War, to focus attention on the future. There was a broad realisation, that the prosperity and well-being of the people of any nation was based upon the commercial stability of that nation. This commercial stability in turn had for its foundation the trading structure and the ability of that nation —where imports were necessary for its existence—to secure a large share of the export market. He held the view that a sound trading structure for internal commercial operation was a vitally necessary basis upon which the potential export trade could be based and developed, and it was therefore essential that industry as a whole should review its existing practices and make such adjustments as were necessary, drastic or otherwise, to secure commercial efficiency. Commercial efficiency in respect of the home market meant not only the most progressive and economic production of goods necessary in the world, but in turn the economic distribution of products to the ultimate user. Not only must the home market be served in an efficient and economic fashion, but the same economy which brought immediate advantage to the public also provided the foundation for a successful export trade.

During the past twelve months the Fair Trading Policy for the industry had undergone close review, and the utmost care and consideration was now being given to the field of wholesale distribution. Whilst it was fundamentally necessary to preserve free enterprise to the utmost, it must be realised that unbounded freedom without regard to the public interest was fatal to the prosperity of any industry. One thing, however, seemed to be absolutely certain. The trading community could justify itself only according to the service which it gave to the public; and service if it meant anything at all, was "good value at a fair price."

The old trading agreements between the association and groups of manufacturers had continued, and the happiest relationship existed between the association and its manufacturing friends. Those relationships were forged many years ago and were frequently reinforced by joint meetings to make adjustments and improvements to the mutual benefit of both parties. Apart from such negotiations, he was anxious to testify as to the increasing goodwill which existed between manufacturers on the one hand and contractors on the other. The end of the war had brought with it a greater appreciation of each other's point of view than had been manifest for a long period of time. There was a growing recognition of the fact that each section of the industry was substantially dependent upon the other, and he welcomed the declarations which had been made by many responsible manufacturers as to their post-war trading policy.

Plea for Mutual Support

Mr. Riggs made a strong plea for mutual support between organised trading associations. He had little sympathy with the trader, whether he be a manufacturer, wholesaler or contractor, who took advantage of all the agreements which the organised industry secured for the trade as a whole, but retained a free hand and

avoided all the obligations which attached to membership of the organised section of the industry to which he should belong. It had been said on innumerable occasions that it did not require a genius to produce something inferior in design and quality to that already on the market, and to sell it at a lower figure. Such was the role frequently adopted by the manufacturer who was not a member of his recognised trade association. Such also reflected the attitude of the contractor who had not yet seen fit to become a member of the E.C.A. Indeed it was common knowledge before the war that certain contractors were not members of the association because they preferred to have a free hand as to wages and working conditions. Generally speaking such wages and working conditions were lower than those required by the national agreements which existed between the E.T.U. and the N.F.E.A. Paradoxically, however, it was just these people, who when the supply of labour became less than the demand, paid higher rates and observed higher conditions—once again without regard to what should have been their just and reasonable obligations.

Lamp Sales

The association in its relationship with the E.L.M.A. was reviewing the existing trading structure. Proposals had been made and were jointly under examination more clearly to define the legitimate province of the manufacturer, with particular regard to the sale of lamps to the category known as recognised users. The fundamental proposal before the associations involved a new conception. It was based upon the principle that the person who desired the facility of buying direct from the manufacturer, should buy only in wholesale quantities. After all, the manufacturer and the wholesaler were distributors on a wholesale basis, and it was surely unnecessary that the manufacturer and the wholesaler should continue, as they had done, to execute orders for what were purely retail quantities. He was not in a position to report the result of these negotiations, far less to indicate whether either one side or other had committed itself to the underlying principle: but he mentioned the matter as one of interest, and to indicate to the membership that the Council was alive to the necessity of securing the greatest possible efficiency and economy in the distribution of all electrical appliances to the public.

Negotiations had ensued during the year between the association and the E.L.M.A., the C.M.A., the Electric Light Fittings Association, the Electric Discharge Lamp Auxiliaries Committee, the Association of Steel Conduit Manufacturers, the makers of domestic refrigerators, and indeed with all interests which directly or indirectly affected the business of electrical contracting and retailing.

New N.E.C.T.A. Sign

A new sign which had been adopted by the N.E.C.T.A. emphasised the intention of the Council to make a big drive to secure that the qualified electrical contractor and retailer was the recognised source of supply of current consuming devices. The electrical contractor and retailer could and did provide technical service to the consumer and would-be user; and, what was equally important, technical "after-sale" service. The distribution of electrical appliances should be confined to those who could give such service. It was not in the public interest that the tinker, tailor and the candlestick maker, without any knowledge or experience whatsoever should "dabble" in current consuming devices which, properly harnessed, could confer untold benefits upon mankind, but which without technical guidance, very frequently failed to perform the service of which they were capable.

A very large number of people had been introduced, during the war, to the benefits of electricity. Their introduction had been via the Forces or in the industrial field. They had been brought into touch with the electrical usage in many practical forms, frequently for the first time, and they would demand, as a post-war right, the continuance in their domestic spheres of the service which electricity could perform.

The demand for current consuming devices was already there. The manufacturers would provide equipment to meet the demand, but this demand and supply was dependent upon efficient technical and after-sale service for its proper application. Mr. Riggs appealed to all members of the association, therefore, to study carefully the development campaign which the association had set in motion, and to equip themselves in such a way as to enjoy the greatest possible share of the market available.

The President urged the membership to take advantage of the opportunity which presented itself for the electrification of farms. For the first time for many years, the farmer was electrically-minded. His labour difficulties had driven home the necessity of mechanisation and he was ready to re-plan on a long-term basis. In fact agriculture as a field for business development by the electrical contracting industry was more than ripe.

With respect to the compulsory registra-

tion of the electrical contractor and the operative, Mr. Riggs regarded this reform to be of paramount importance in fulfilment of the industry's obligation to the public. Efforts to achieve this object had been vigorously pursued during the past twelve months. The Minister of Fuel and Power had shown interest in the project, but, with true Ministerial impartiality, he had not "shown his hand." Quite recently, the association, in company with the E.T.U., in negotiating with the Ministry of Labour on matters connected with the proper and orderly entry of work people into the contracting industry, pointed out the absurdity of leaving the door wide open for thousands to enter as "master men" or employers without any control or restriction whatever,

The association did not, however, seek registration for the sake of restriction, but, based its claim for compulsory registration upon the need to give service to the public. He was disappointed that the B.E.A.M.A. did not appear to have supported the scheme as much as it might have done. The safety of the public was the concern of everybody engaged in the industry and it seemed to be a short-sighted policy for the manufacturer to be content to jeopardise his name and goodwill by misuse of the goods he manufactured because they had been installed by people who were not qualified so to do.

The National Register of Electrical Installation Contractors, which had been the voluntary body for the past 21 years, had advocated the adoption of compulsory registration.

Labour Matters

The association's relation with the E.T.U. under the auspices of the National Joint Industrial Council for the Electrical Contracting Industry, had during the past twelve months made further progress towards the operation of National Working Rules, as distinct from Local Working Rules. A big step forward had been made in establishing a National Working Rule as to travelling time, etc. in place of the varying arrangements which existed throughout the country previously.

The Holidays with Pay Agreement which became an accomplished fact two years ago had worked smoothly.

As to what wages should be paid to the labour force employed in the industry, these should be considered with continuity of employment. During the war period workers employed by those scheduled under the Essential Work Order had had the benefit of a guaranteed weekly wage packet. The employer's ability to give continuity of employment—and indeed his ability to provide a guaranteed wage packet—depended wholly upon his ability to secure the necessary contracts and work which alone made it possible for the employment to be given. In effect, therefore, the two immediate partners in the industry were dependent on their joint ability to give the service the public required, efficiently and economically.

An agreement between the N.F.E.A. and the Association of Supervising Electrical Engineers, which replaced the old agreement made in 1921, concerned supervising electrical engineers and staff foremen. Although its terms were not entirely welcomed in one particular part of the country, Mr. Riggs was convinced that it would be found upon experience that the agreement would be of benefit to the industry as a whole, and would serve to cement further the relationship which existed between the N.F.E.A. and the A.S.E.E.

Mr. H. M. Drake

With respect to the association's participation in the Building Apprenticeship and Training Council, a body set up under the auspices of the Ministry of Works to ensure the adequate supply of new labour into the building industry and to make arrangements for its orderly and trained entry, this matter had been under consideration during the past year, and the association had come to the conclusion that the best interests of the industry would be served by the establishment of a separate council, especially designed to meet the exigencies of an electrical contracting industry. With that end in view, the association was making representation to the Minister of Works.

During the past year, membership of the association had increased from 1 653 to 1 731. At the commencement of the war membership was 1 897; it reached its lowest ebb in 1943 when it dropped to 1 597. The war had brought many changes, and no fewer than 14 members of the Council in 1939/40, were no longer serving on the body; 33 new members had, however, been welcomed to the Council.

Islington (London). — The Electricity Committee is to repair a boiler economiser at an estimated cost of £3 390.

Electricity Supply

Darlington.—The T.C. is to spend £917 laying electric mains in Burnside Road.

Southwark.—The Electricity Committee reports a net deficit of £7 948 for the year.

Bradford.—The Electricity Committee recommends an increase in charges of 5 per cent.

Rawtenstall.—The Electricity Committee is seeking sanction to borrow £10 000 for extensions.

Rotherham.—The Electricity Committee is to provide supply to temporary houses at Herringthorpe Valley Road at a cost of £1 410.

Scarborough. — Sanction to borrow £4 600 for mains and services and substations, has been obtained by the Electricity Committee.

Lichfield.—The Electricity Committee has obtained sanction to borrow £1 000 for mains and services and £3 500 for extensions to Dovehouse Fields.

Fulham (London). — The Electricity Committee has obtained sanction to borrow £200 000 for the purchase of two colliers for the power station.

Portland.—The Electricity Committee has obtained sanction to borrow £1 463 for supply improvements in the Underhill and Tophill districts and is seeking sanction to borrow £550 for supply to the Weston housing site.

London. — The Metropolitan Water Board is to instal a diesel-driven alternator at a cost of £3 500 at Ferry Lane pumping station, and electrical plant for the remodelled Dartford pumping station at a cost of £7 850.

Bradford.—At a meeting of the Reconstruction Committee the chairman stated that he was in consultation with the Electrical Engineer regarding a suggestion that a hydro-electric station be constructed at Apperley Bridge.

Blackburn.—A scheme has been prepared to provide electricity for farms on the Woodfold Park Estate, costing £4 322. This was approved by the Committee and application is being made for sanction to borrow the money.

Stoke Newington (London).—The Highways Committee recommends improved street lighting by electricity at a cost of £7 550 in part of the borough. It is pointed out that a complete scheme will involve an outlay of £37 000.

Fulham (London). — The Electricity Committee is to provide additional supply to Weldandgrind, Ltd., at a cost of £4 685, the company agreeing to contribute £900, and guarantee an account of £250 per annum for three years.

Chesterfield.—The Electricity Committee is to provide supply to Arnold Laver and Co. Ltd., at West Bars at a cost of £377, improve supply to Joseph Clayton and Sons Ltd., at a cost of £1 604, and improve supply in the Highfield area at £3 242.

Brighton.—The Public Utilities Committee is to extend the 33 kV system from the power station to a sub-station to be erected at Withdeen at a cost of £72 814. It is essential to put the scheme in hand at once with a view to completion in the autumn of 1946.

Leicester.—The Electricity Committee announces a surplus on the year's working of £112 000. Coal costs have gone up by £88 000 and wages have also risen. The whole surplus is to be devoted to the redemption of debt, a policy which the Committee has carried out for a number of years.

Stoke Newington.—The Highways Committee is to purchase 140 time switches at an estimated cost of £450 for installation in houses from which a supply is taken for the temporary conversion to electricity of street lamps formerly supplied by gas. The switches will be used later in the major scheme for improved street lighting.

Blackburn.—Returns of the electricity undertaking for the year to March 31 last show a net profit of £29 980, against £11 261 for the previous year. Units sold totalled 97 411 112, an increase of 1.6 per cent. During the year the ordinary tariffs were increased by 7½ per cent. against an increase of 180 per cent. in the full costs.

Portland.—At a meeting of the Electricity Committee it was reported that engineers from the General Electric Co. Ltd. had made a survey of the main road from Victoria Square to Pennsylvania Castle in order to prepare their estimate of the cost of installing fluorescent street lighting, it being estimated that the capital cost would be approximately £3 500.

Rotherham.—During the year ended March 31, the Town Council's tramcar service earned a surplus of £10 755 and the trolley buses £19 848. Passengers carried on the services (including motor buses) numbered 50 768 312, an increase of about two millions. The total profit increased by more than £2 500 to £61 844. The annual report states that the total capital expenditure was £486 907 and the undertaking was debt free.

Hull.—The annual report of the electricity undertaking shows a net profit on the year of £27 997. Units generated exceeded 343 000 000 and coal consumed amounted to 224 851 tons. In addition to

a 32.4 increase in the price of coal over 1939 the average calorific value and suitability were considerably lower. The increase on general tariffs above the pre-war level was only 5 per cent. and the 5 per cent. discount for prompt payment remained. Considerable extensions are in contemplation and it is stated that contracts already let amount to over £800 000.

Rothesay-Dunoon Cable.—It is reported that negotiations are at present in progress between the North of Scotland Hydro-Electric Board and local authorities in Bute and Cowal for the building of a transmission cable carrying 22 000 V between Rothesay and Dunoon. The Board recently purchased Rothesay Corporation's power plant and distribution system, the change-over taking place next May, and are now financing the installation of additional generators. From Rothesay the line would run to the north end of Bute, crossing the Kyles by submarine cable at Colintraive, and thence by the head of Loch Striven to Dunoon. Ultimately it will be fed from the hydro-electric plant which it is proposed to construct at the head of Loch Striven, and which would supply current to Bute, South Cowal, and Cumbrae.

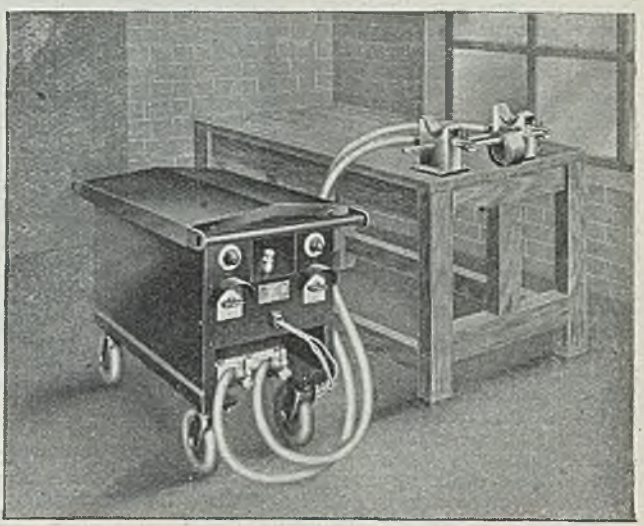
Birmingham.—The report of the electricity undertaking for the year ended March 31 last states that the quantity of electrical energy sold within the undertaking was approximately 1 261 million units. In addition, 357 million units were supplied to the Central Electricity Board for use in other parts of the country. The revenue for the year was £4 703 820, and the trading expenditure amounted to £3 803 279, which includes the provision of £60 000 in respect of any contribution which may be required under the special War Damage Act for public utility undertakings. The balance carried forward to net revenue account is £900 541 and miscellaneous credits have increased this to £950 863. After meeting capital charges, income tax, etc., (including a special payment of £100 974 to accelerate the redemption of loans in respect of Nechells Princes generating station) the surplus on the year's working is £33 130. During the six years from April 1, 1939, to March 31, 1945, 4 983 million units were supplied to war factories out of a total of 7 143 million units supplied for all purposes. The annual sales of electricity rose from 815 million units in the year ended March 31, 1939, to 1 353 million units during the year 1943-44 and fell to 1 261 million units in the year 1944-45. The maximum supply demand has increased from 325 500 kW in 1938-39 to 457 500 kW in 1944-45, and the number of consumers has risen from 283 479 at March 31, 1939, to 307 318 at March 31, 1945.

Electrification at Caistor.—A letter from Mr. W. R. T. Skinner, general manager of the North Lincolnshire and Howdenshire Electricity Co., was read at a meeting of the Caistor Rural District Council on July 21, relative to complaints of delay and discrimination in the electrification of rural areas in Lincolnshire. Mr. Skinner stated in his letter that the criticisms made by the Council at its last meeting must convey to the public an impression that the company had been dilatory in developing the supply of electricity in its area. This charge was denied. Construction work had been going ahead, it was stated, at a rate which could only be regarded as high. The letter recalled the fact that supply powers were granted towards the end of 1932 and active development started in 1933. In six years, 300 miles of h.t. lines and 200 miles of distribution lines were erected and at the beginning of the war the company had 9 500 consumers. Out of 44 villages with a population of over 500, 43 had been supplied; out of 58 between 250 and 500, 40 had been supplied, and out of 134 villages with populations of less than 250, 51 had been supplied. Two days previously, it was added, the prohibition of development except in special circumstances was removed but, even so, regard had to be paid to the shortage of labour and materials and the supply of current to new consumers must continue to be governed for a time by priority considerations. Councillor Nickerson maintained that previous criticism had been fully justified. The company was quite right in saying what they have done for the large villages, but the wider responsibilities in the whole rural district had to be remembered. Councillor H. F. Riggall (Limber): It does not seem from this letter as though there is much hope yet for villages which have been trying to get electricity for 20 years. Councillor A. H. Lingard, spokesman for a group of villages round Waddingham, said they had made every effort to have current supplied but without avail. Waddingham, he pointed out, was a village with a population of about 600. Councillor J. P. Cartledge (Cabourne) made the point that farms should in these days be given some measure of priority. Councillor J. Sandham complained that in supplying country towns like Caistor, a guarantee of £20 a year had been demanded. Councillor Cartledge said that seven years ago Cabourne people were promised electricity in three months. It was still not available.

New Equipment and Appliances

Direct Current Plant for Crack Detection

The **Equipment and Engineering Co., Ltd.**, have developed a d.c. impulse magnetiser, type WA, for crack detection as an alternative to their Cirflux a.c. impulse models (type L. series). In advising us of this development, the company point out that it is well-known that a.c. tends to travel in the outer surfaces of the conductors carrying it, giving place to "skin" effect. As a result the corresponding magnetising effect is also confined to the surfaces of the parts being tested, with the result that d.c. magnetisation is to be preferred where sub-surface defects are sought, or where the depths of cracks require to be known by the build-up of the magnetic particles in the detecting ink. This feature has already been recognised by many users of magnetic crack detection, and inspection authorities have in some cases stipulated that d.c. impulses should be employed in the testing of certain parts.



The Type WA d.c. impulse magnetising equipment

To meet this requirement much research work has been involved. The production of low voltage d.c. of high value is not an easy matter. In some cases accumulators of the car starter type have been used, but here the complication due to recharging and maintenance has been a disadvantage.

Another difficulty pointed out by the company as being associated with the a.c. impulse magnetiser, is that of inductive effects. These may offer a serious impedance to the high amperage currents, especially where large loops in the connecting cables are unavoidable. For instance where impulse tests have to be applied to long metal bars, it is generally necessary to increase the output voltage of the a.c. generating unit to overcome the inductance involved. Again, when testing parts by passing a magnetising a.c. cable round them, it is easy to produce a choking effect which reduces the impulse current to a very small value. These difficulties, it is claimed, do not arise with d.c. impulses and thus the tests produced are more reliable.

The development of the high capacity selenium metal rectifier has facilitated the production of a suitable magnetising unit for the generation of high value low voltage d.c. impulse currents, and this is illustrated herewith. The unit is operated from a three-phase supply and gives a d.c. impulse output up to 1 000 A at a low pressure. It is fitted with a main three-phase transformer, operated from a regulating auto-transformer which gives four values of current adjustment by means of a four-way step switch. The unit is arranged to operate upon three-phase supply of 50 cycle periodicity between 346 to 440 V. The impulse is controlled by a pneumatic timing relay which confines the period to approximately 1 sec. duration and the duty cycle is rated at one impulse every thirty secs. Two pilot lights are incorporated on the plant. One (red) which becomes illuminated directly the main three-pole switch is turned to the "on" position. The other (green) lights up during the passage of the impulse current, and proves sound contact of the connections to the parts under test. A three-pole contactor is also incorporated to close the main circuit to the transformers and is controlled by an operating push on the front panel. Three main fuses are also fitted. The rectifier units are arranged in multiple banks and are easily accessible and well ventilated.

Industrial Information

Distribution-Gear Window Display.—A. Reyrolle and Co. Ltd. have two display-windows at their works, where from time to time they exhibit items of interest to their employees. The illustration shows one of these, containing HH unit - type distribution - gear, which was selected for display because the extent to which its use has increased, and the consequent expansion of production-facilities to meet the growing demand, suggested that it would be advantageous to show all the employees, particularly those engaged in making its various components, not only how the components are assembled, but also how its world-wide use takes it into many greatly varying climates.

Window display featuring Reyrolle type HH distribution gear

Price Adjustment Formulæ.—The B.E.A.M.A. announce that for purposes of calculating variations in (a) "Rates of Pay"—the rate of pay for adult male labour at July 14 shall be deemed to be 95s.; (b) "Costs of Material"—the Index figure for Intermediate Products last published by the Board of Trade on July 14 is 181.9 and is the figure for the month of June, 1945.

Electricity in Mines.—The Minister of Fuel and Power has issued a list of electrical apparatus for which certificates of flameproof enclosure have been granted during the three months ended June 30 last. At the request of the British Electrical and Allied Manufacturers' Association, a few copies of these quarterly lists are on sale, 1s. 2½d. (post free), at The Library, Ministry of Fuel and Power, King's Buildings, Dean Stanley Street, S.W.1.

Gauge and Tool Makers.—The Gauge and Tool Makers' Association have prepared a members' handbook for 1945, copies of which are available on application to the association. An exhibition of inspection equipment is being arranged by the Sheffield Trades Technical Societies during the week August 20 to 25. The co-operation of the association was invited, and several member-firms will be exhibiting. In addition, the association will have its own stand. The exhibition, which is to be of an educational character and will cover equipment, machines, appliances and instruments, used in the work of inspection, will be held in the Cutler's Hall, Sheffield.

Aluminium Alloy Extruded Sections.—The value of the extrusion process as a method of producing aluminium-alloy sections in a variety of shapes is now so well-known as hardly to need emphasis. But whether light alloy extrusions have always been used in the past in the most efficient way is another matter, and the aim of a recently published brochure, which has been compiled by the Technical Committee of the Wrought Light Alloys Association and issued for that body by the Aluminium Development Association from which copies are obtainable, is to provide design staffs with the necessary information on the design of extruded sections to make for maximum efficiency. Comprehensive data on manufacturing tolerances are given in tables covering round bars, hexagonal bars, overall widths for regular sections, thickness for regular sections, open ends for right-angled channels, I beams, H sections, etc. Also included is a brief summary of the mechanical properties of typical aluminium alloys quoted, by permission, from B.S. 1161: 1944, "Aluminium Alloy Sections."

Hotwater Jacket Patent Extended.—In the Chancery Division of the High Courts on July 18, Mr. Justice Uthwatt had before him an application by T. J. McCullock and Co., for an extension of patent No. 328 472 relating to coverings for domestic hot water pipes and cisterns, known as hot water jackets.

Mr. J. Mould, for the applicants, said the ground for the application was loss due to the war. The patent was dated May, 1929, and expired in May last. The product was in demand by electricity undertakings and local authorities having housing estates. Prior to the war the sales were

steadily rising, but during the war they had dropped. The average rate before the war was 10 042 a year.

His lordship made a re-grant of the patent of 3 years and 8 months.

New Renfrew Industry.—M'Ewan King Industries Ltd., has acquired ground for the erection of a new plant for the manufacture of a variety of products, including a range of industrial refrigerators. The company will also manufacture for the mechanical industries a version of their quickly detachable flexible pipe coupling.

Negative Rake Milling.—The Machine Tool Control have issued a booklet on some recent developments and practice of negative rake milling.

Association of Consulting Engineers.—The Association of Consulting Engineers, 26, Victoria Street, London, S.W.1, have issued a list of members for 1945, price 9d., or for non-members 1s.

Two-pole Neon Tester.—The Acru Electric Tool Manufacturing Co. Ltd., 123, Hyde Road, Ardwick, Manchester 12, have issued a leaflet describing their new universal neon tester. This is supplied in a moulded plastic case and is made for carrying in a vest pocket. It is operative with a.c. or d.c. on 100 to 400 V, and is useful for detection of supply systems, leakages, polarity, and continuity testing. The instrument is made in two types, each with

All-electric housing is proclaimed by the Brighton electricity department on the local buses

flexible leads, 4½ in. and 7 in. long respectively.

Advertisements on Public Transport Vehicles.—We reproduce above a photograph showing one of a number of advertisements which are now being displayed on buses and trolley-buses by Brighton electricity undertaking, indicating thereby the return of normal trading activities after a long period of repression.

A.E.I. News.—The current issue of this journal, published by Associated Electrical Industries, Ltd., contains a message from Sir George Bailey, on his assuming the duties of managing director. Some notes on the retirement of Mr. H. N. Sporberg, are included with further personal paragraphs respecting Mr. H. Warren's appointment as managing director of the B.T-H. Co., and the appointment of Mr. I. R. Cox to a similar position with the Metropolitan Vickers Electrical Co., Ltd. News of liberated prisoners of war who were formerly employed in the A.E.I. group is also given.

Change of Address.—The address of the Institute of Physics and of the Journal of Scientific Instruments, will, as from July 31, be changed to 19, Albemarle Street, London, W.1. Telephone: Regent 3541.

Modern Building Tools.—The Ministry of Works has announced the following dates and sites for the demonstrations of power-driven hand tools for the building industry: Glasgow—August 14-18—Glasgow Green, on site adjacent to People's Palace; Newcastle, August 28-September 1—Lovaine Place, Barras Bridge, Newcastle; Liverpool—September 11-15—site not yet determined; Manchester, September 25-29—site not yet finalised; Birmingham, October 9-13—Big Top site, New Street, Birmingham; Bristol, October 23-27—Black Boy's Hill, Bristol.

Unification of Engineering Standards.—The opening date of the Conference on the Unification of Engineering Standards has been fixed for September 24, 1945. In announcing the date, the Combined Production and Resources Board state that the conference will be held in Ottawa, Canada, and will be attended by delegations appointed by Canada, Great Britain and the United States. This will be the third in the series of conferences which have been held during the last two years under the auspices of C.P.R.B. Plans have been made to discuss limits and fits and drawing practice. Differences in Anglo-American practice in these fields have, during the war, caused considerable difficulty in the combined effort to secure interchangeable production and use of military and other essential equipment on a large scale. Steps have already been taken towards unifying these practices, and it is expected that the talks at Ottawa will clear the way for standardisation to the ultimate benefit of industry. The development and acceptance of such standards will inevitably take time. In view of this, it has been pointed out, so far as screw threads are concerned, that there is no question of an immediate and wholesale scrapping of plant, equipment and stores, involving widespread disruption in industry and considerable capital expenditure. Moreover, most of the production equipment affected would be tools and gauges—consumable items which are

continually being replaced and are, therefore, a normal expense in any circumstance.

Surface Finish. — Arthur Scrivener, Ltd., Tyburn Road, Birmingham, has issued circular No. 112 which describes a new method of helping to ensure good surface finish by electro-magnetic means.

Company Law Amendment Report.—The Report of the Committee on Company Law Amendment has been published as a White Paper (Cmd. 6659). Copies can be obtained from the Stationery Office. Price 2s. net.

Goods Made in Canada.—The Board of Trade have received a copy of a Memorandum, Series D, No. 51, M.C.R. 63, dated June 15, 1945, issued by the Canadian Department of National Revenue, which states that wire drawing machines, designed for drawing non-ferrous wire (other than tungsten, molybdenum and platinum) having a maximum entering size of No. 10 Imperial Standard Gauge (0.12849 in.) have now been ruled to be of a class or kind made in Canada, with effect three weeks from the date of the memorandum.

Trading with the Enemy.—The Board of Trade announce that, for the convenience of traders and others, the list of specified persons which is at present embodied in seven Orders has been published in a new consolidating Order. The title of the consolidating Order is the Trading with the Enemy (Specified Persons) (Amendment) (No. 8) Order, 1945 (S.R. & O. 1945 No. 830 price 3s.). Persons owing moneys to, or holding or managing the property of, specified persons are reminded that they are under statutory obligation to report particulars to the Custodians of Enemy Property.

Electrical Commodities.—A manufacturer's agent established in Dundas, Ontario, wishes to secure the representation of United Kingdom manufacturers of pressure pump system milking machines, paint sprayers, etc., emery grinders, grain grinders, drills, vacuum cleaners, irons, toasters, etc. Inquiries, quoting reference No. Z38873 (a), to the Department of Overseas Trade.

State Bursaries for Fuel Technology.—The current issue of Fuel Efficiency News, issued by the Ministry of Fuel and Power, gives details of the State Bursaries for Fuel Technology which the Ministry of Education, the Scottish Education Department, and the Ministry of Labour will award this year. The awards will be made to candidates of British nationality born between October 1, 1926, and June 30, 1928, inclusive, and who are resident in Great Britain on the date of application. The awards will date from the beginning of the Academic Year, 1945-6 (Autumn, 1945), and will be given in the first instance for a year, but ordinarily they will be renewed for such longer period as may be required. In England and Wales the necessary standards for the award are equivalent to a creditable performance in mathematics, physics and chemistry as principal subjects in the Higher Certificate Examination. In Scotland a standard equivalent to a creditable performance at the Senior Leaving Certificate Examination of the Scottish Education Department in higher mathematics and higher science (Physics and Chemistry). Bursaries will be allocated to Universities, University Colleges and Technical Colleges, and in general, will be assessed without regard to the parents' financial circumstances and will, in addition to fees, include payment of maintenance allowance. Further information can be obtained from the Ministry of Education (Awards Branch, 14-22, Lennox Gardens, London, S.W.1, or the Scottish Education Department (Room 8), 9-10, Abercromby Place, Edinburgh 3.

Contracts Open

WE give below the latest information regarding contracts for which tenders are invited. In the case of overseas contracts, particulars are to be had from the Department of Overseas Trade, Millbank, London, S.W.1 (corner Horseferry Road), unless otherwise stated.

Southampton T.C., August 1.—Supply and delivery during the period ended March 31, of (a) p.i. cables up to 11 kV, and (b) domestic electric apparatus, including cookers, kettles, thermal storage tanks, circulators and wash-boilers. Specification from Mr. W. G. Turner, Civic Centre, Southampton; deposit £1 1s. each.

Belfast Electricity Department, August 3.—Supply, delivery and erection of (a) carbon dioxide extinguishing equipments for electrical sub-stations (Spec. G. 49), and (b) replating regulating cells of storage battery (Spec. G. 51). Forms of tender from the City Electrical Engineer and General Manager, East Bridge Street, Belfast.

Whittingham Mental Hospital, August 3.—Supply and erection of a generating plant and other electrical gear. Form of tender from Mr. W. A. Higgs, Clerk and Steward.

Swansea B.C., August 4.—Construction of an electrically equipped pumping station at Morriston Park. Specification from Mr. T. Price, Guildhall, Swansea; deposit £5 5s.

Manchester City Council, August 11.—Supply and delivery of overhead equipment materials for trolley-bus operation. Specifications from the General Manager, Transport Department, 55, Piccadilly, Manchester, 1.

Company News

WAYGOOD-OTIS, LTD. — Intm. 10% (same).

DAVIES AND METCALFE LTD.—Intm. div. 3% (same).

MATHER AND PLATT, LTD.—Intm. 4% (same), less tax.

QUEBEC POWER.—Qtrly. div. 25 cts. per sh., payable Aug. 25.

YORKSHIRE ELECTRIC POWER CO., LTD. —Intm. div. 3% (same).

ALUMINIUM (U.S.).—Reg. qtrly. $2, payable from Canadian funds.

ELECTRICAL DISTRIBUTION OF YORKSHIRE, LTD.—Intm. div. 4½% (same).

W. G. ALLEN AND SONS (TIPTON).—Fin. div. 7½% less tax, mkg. 10% (both same).

GLOBE TELEGRAPH AND TRUST.—Fst. and fin. 3½% (3%). Net rev. 1944, £5 469 (£5 932).

METROPOLITAN ELECTRIC SUPPLY CO., LTD.—Intm. div. 3% on ord. (same), payable Aug. 8.

NICO LIGHT CO., LTD.—Pft. to Mar. 31 £3 085 (£2 401), div. 7½% £2 029 (same), fwd. £4 510 (£3 454).

E. AND H. P. SMITH LTD.—Net pft. to Mar. 31 (after tax) £6 778 (£9 395). Fin. 7½%, mkg. 12½% (same).

CROSSLEY-PREMIER ENGINES, LTD.—Fst. and fin. on ord. 10% (same). Net pft. to Apr. 30, £18 619 (£14 304).

SMETHWICK DROP FORGINGS LTD.—Sec. intm. yr. to Mar. 31, 20% less tax (same). Fst. intm. was 12½% (same).

EIRE ELECTRICITY SUPPLY BOARD.—Deficit on yr's. working is stated as £320 145; revenue for the period was £2 458 471.

ANGLO-AMERICAN TELEGRAPH CO. LTD.— Intm. qtr. to June 30 15s.% (same), on ord., and £1 10s.% (same) on prefd. ord.

MIRRLEES WATSON CO., LTD.—Net pft. to Mar. 31, £19 488 (£32 236), but fig. is not comparable on acct. of sale of part assets.

HARLAND ENGINEERING CO., LTD.—Dirs. propose to increase nom. cap. from £300 000 to £350 000 by creatn. of 200 000 5s. shs.

GREENWOOD AND BATLEY, LTD.—Fin. on ord. 10% (same), mkg. 15% (same). Tradg. pft. to May 31, £145 583 (£155 105).

WESTINGHOUSE ELECTRIC CORPORATION (U.S.).—Orders received in fst. six mos. of 1945 amounted to $505 243 144, a 13% increase over the like period of 1944.

RHEOSTATIC CO., LTD.—Nom. cap. has bn. increased by addition of £130 000 beyond the reg. cap. of £120 000, divided into 100 000 6% cum. pref. shs. of 10s. and 400 000 ord. shs. of 4s.

SHEFFIELD STEEL PRODUCTS LTD.— Tradg. pft. for yr. to Mar. 31, £81 054 (£92 996). Net pft. £22 365 (£32 959). Div. on ord. absorbs. £6 978 (same). Carry-fwd. £26 513, £1 898 increase.

BENN BROTHERS LTD. (Publishers of THE ELECTRICIAN).—Dirs. recommend paymt. of 3% on pref. shs., mkg. 6% (same) for yr.; 12½% (same) on ord. shares, which with intm. 5% makes 17½% (same) for yr. and 3s. 6d. (same) per sh. on defd.

KALGOORLIE ELECTRIC TRAMWAYS.— Operatg. receipts for 1944 £A.34 051 (£A.32 246) and net pft. on workg. before chargg. int. on "B" deb. stk. £3 685 (£2 426). In accordance with prov. of supplemental trust deed net pft. transf. to res. for redemptn. of "B" deb. stk.

NEWMAN AND WATSON LTD.—Income to Mar. 31, £9 462 (£7 134). To deprecn. £829 (£915), dirs.' fees £950 (same), bank int. nil (£40), war insurances £133 (£293), gen. res. £486 (£114), taxn. £3 831 (£2 681), leavg. net pft. £3 233 (£2 141). Brot. in £6 014 mkg. avail. blce. £9 247 (£8 264). To pref. div. £2 250, fwd. £6 997.

E. AND H. P. SMITH LTD.—Tradg. pft. etc. to Mar. 31 £24 132 (£25 105). Dirs.' fees £662 (£650), taxn. £16 692 (£15 060), leavg. net pft. £6 778 (£9 395). Intm. 5% £1 500 (same), to gen. conting. £2 500 (£5 000), fin. div. 7½% £2 250 (same), mkg. 12½% less tax (same), fwd. £6 293 (£5 765).

H. J. BALDWIN LTD.—Pft. to Mar. 31, before taxn., £21 517 (£22 136). Deduct taxn. £5 100 (£5 680) there remains £16 417 (£16 456), plus £16 695 (£13 239) brot. in and pft. on sale of assets nil (£56 374). To pref. div. £3 000 (same), ord. div. 10% (same) £10 000, fwd. £20 112.

WELLMAN SMITH OWEN ENGINEERING.— Tradg. pft. to Mar. 31 £92 697 (£93 357) incldg. £43 336 (nil) held in res. on contracts not required. Tax £51 000 (same), div. 12½% (£31 570 (same), to gen. res. £10 000 (same), fwd. £46 645 (£46 518).

CINEMA TELEVISION AND BUSH RADIO.— Proposals for the merger of Cinema Television and Bush Radio, and the increase of cap. to £1 198 250 by creatn. of 550 000 5% cum. pref. shs. of £1, and 12 000 000 "A" ord. shs. of 6d., have been approved.

GENERAL GAS AND ELECTRICITY CO.— Rev. to Mar. 31, £18 674 (£19 099). After exes. and prior charges, taxn. £4 240 (£4 789), net pft. £3 869 (£4 360), plus £4 000 (£3 640) brot. in. To pref. divs.

£1 650 (nil), invest. res. £2 700 (£4 000), fwd. £4 137.

CHRISTY BROTHERS AND CO. LTD.—Gross tradg. pft. to Mar. 31 £69 488 (£71 288). To exes. £26 265 (£25 221), deprecn. £633 (£750), lvg. pft. £42 590 (£45 317), plus divs. and int. £22 384 (£19 848). Tax and N.D.C. £22 145 (£21 497), loan int. £300 (£382), superannuatn. £2 000, to genl. res. £5 000, pref. div. £2 250, bonuses £18 750, ord. div. 17½% £13 125 (all same), fwd. £22 877 (£21 473).

EDGAR ALLEN AND CO. LTD.—Tradg. pft. to Mar. 31, £196 982 (£348 667), plus int. £13 150 (£13 742) and subsids.' net pfts. £2 404 (£6 198), mkg. £212 536 (£368 607). To deprecn. £37 553 (£37 408), dir.'s fee £300 (same), tax £125 000 (£274 000), war damage payment £1 900 (£2 600), net pft. £47 783 (£54 299). Brot. in £46 184 mkg. avail. blce. £93 967 (£91 640). To gen. res. £20 000 (same), pref. div. £7 500 (same), ord. div. 12½%, less tax (same) £17 956, fwd. £48 511.

WARD AND GOLDSTONE, LTD.—Pft. to Mar. 31 £130 104 (£47 190). To provident scheme £1 500 (same). dirs.' fees £300 (£600), defd. reprs. nil (£5 000), deprecn. £9 786 (£10 470), war dmge. £895 (£1 290), inc.-tax and E.P.T. £78 684 (nil), leavg. net pft. £38 939 (£28 330). Pref. div. £2 800 (same), intm. ord. 10% £4 719 (same), fin. ord. 10% (same) and bonus 5% (nil), mkg. 25% (20), £7 072 (£4 718), to tax res. £15 000 (£10 000), fwd. £55 542 (£46 194).

ELECTROLUX CORPN.—Pft. 1944 before deprecn.: cleaners, etc., $116 570 ($372 270), war orders $1 708 875 ($540 154), miscellaneous income $38 199 ($26 055), mkg. $1 863 644 ($938 479). Deduct deprecn. $241 312 ($245 545), int. $8 198 ($11 300), provn. for Federal inc.-tax (no E.P.T. prov. required) $675 000 ($275 000), contings. $250 000 (nil). Earned surplus $4 269 370 ($3 812 736), mkg. $5 118 332. Div. 25 cents per sh. (nil) $309 375, leavg. earned surplus $4 808 957.

HICK HARGREAVES AND CO. LTD.—Tradg. pft., after tax, to Mar. 31 £50 818 (£52 835), plus bank int.—less deb. int.—£220 (£159), and other int. £1 529 (£1 541), mkg. £52 557 (£54 536). To deprecn. £13 163 (£12 883), war damage ins. £832 (£1 483); net pft. £38 572 (£40 169). Brot. in £1 727, mkg. avail. blce. £40 299 (£43 077). To conting. res. £10 000 (same), employees' welfare fund £2 000 (£5 000 for foundatn. of fund), intm. div. 2% £4 800 (same), fin. div. 8% £19 200 (same); fwd. subject to dirs.' fees, £4 299 (£4 077).

ASSOCIATED BELTING COS.—Div. and int. to June 30 £8 925 (£8 791). To dirs.' fees £700 (same), exes. £394 (same), pref div. £5 437 (same), ord. div. and bonus 3½% (2½%) £2 275 (£1 625), fwd. £4 260 (£4 141). Tdg. pft. of subsid. cos. was £69 780 (£59 150), less inc. tax and E.P.T. £60 299 (£53 270), divs. to parent co. £8 102 (£7 865), fwd. £9 779 (£8 400).

DAWNAYS LTD.—Trdg. pft. to Mar. 31, £70 733 (£88 553). Dirs.' fees £1 350 (£618), deprecn. £11 008 (£11 011), A.R.P. and war damage £1 864 (£3 613) taxatn. incldg. inc. tax on curr. pfts. (£24 000 (£37 000), lvg. net pft. £32 511 (£36 311). Brot. in £185 866 (£174 945), mkg. £218 377 (£211 256). Intm. £9 521 (nil), fin. div. 12½% £15 869, mkg. 20%, less tax (fst. and fin. 20% £23 390), fwd. £192,987.

Company Meetings

JOHNSON, MATTHEY AND CO., LTD.—Presiding at the annual meeting in London, on June 27, Mr. H. W. P. Matthey, the chairman, said that £100 000 had been allocated to the staff superannuation fund in order to adjust the ratio of pension to salary. Although the carry-forward at the end of each of the last two years had exceeded £700 000, it had not been found possible to recommend a total distribution for the last year in excess of a 6 per cent. dividend, plus a 6 per cent. bonus by reason of the fact that the whole of the company's machinery and equipment had been used mercilessly throughout the war and was now in such a state as to call for replacement of a very large part and complete overhaul of the remainder. During the war the company had made some 15 000 pieces of platinum laboratory apparatus, including crucibles and electrodes. Throughout the electrical industry—from the generation and transmission of power to the design and manufacture of the most sensitive types of instruments and radio equipment—their materials were widely employed in a large variety of components.

MARCONI'S WIRELESS TELEGRAPH WORKS CO., LTD.—The ordinary general meeting was held recently when Admiral H. W. Grant, chairman and managing director, presided. In his statement circulated with the report for year ended December 31, 1944, he pointed out, in view of the work to be done on behalf of Government departments, particularly the Admiralty, he considered it inadvisable to make detailed reference to the company's war-time activities, except to say that during the year the company reached its highest peak of production. With regard to post-war business, it was a matter of constant concern to them. They were handicapped by the lack of young and talented technicians suited to their specialised work and the company was doing its utmost to prevail upon the authorities to return those

who left for war service. With the return of these men and the recruitment of other suitable personnel, he was confident that the company will be able to handle successfully the enormous post-war programme before it.

The Chairman, addressing the meeting, said: I wish to emphasise the pride which I have in being chairman of such a band of brothers whom we have working for this company. They have all worked magnificently and have earned the respect and commendation of all the Government Departments with whom we have had to deal. We are getting a tremendous amount of work, and I wish that details could be published. I hope that one of these days it may be permissible to publish an account of the splendid work that has been done, without any ostentation because of its secrecy.

COMPANY MEETING

TELEPHONE MANUFACTURING COMPANY

Important War Achievements

Mr. Fred T. Jackson's Speech

THE fifteenth annual general meeting of Telephone Manufacturing Company Ltd. was held on July 23 at The Institute of Chartered Accountants, Moorgate Place, London, E.C., Mr. Fred T. Jackson, O.B.E. (Chairman and Managing Director), presiding.

The Chairman, in the course of his speech, said: Net profit is £217 719 as compared with £274 083 for the year 1943, and shows a fall of £56 400, which is consequential on the fall of gross profit after taking into account the slight increase in costs this year and the adjustments made last year in respect of costed contracts.

We have set aside £14 376 to the reserve account and after payment of the interim dividend of 2½ per cent. we have made provision for the final dividend of 6½ per cent., which is the same rate as the previous year, leaving £10 010 to be carried forward to the ensuing year, which is approximately the same amount as was brought forward from last year.

War Activities

Since the outbreak of war in Europe this is the first annual general meeting at which I am able to give you an account of your company's activities during the war years in Europe and in greater detail than can be conveyed in a directors' report and accounts. Even now the whole story cannot be told, for a most important piece of apparatus developed and designed by our own research engineers is still on the secret list and likely to remain there for some time, but it will be of some interest and satisfaction to you that this apparatus was entirely the result of private enterprise.

Other special apparatus of our manufacture proved to be of great value on "D" Day and in the crossing of the Rhine. This apparatus was fundamentally the idea of research workers in one of the Ministry of Supply Research Stations, S.R.D.E.

Telecommunication and Transmission Equipment

The Government decided very early on in the war that our experience and technique could best be utilised in the design and production of Telecommunication and Transmission Equipment, therefore, we have not had to depart from the industry in which we have made our reputation, but during the war years we have confined all our energies to direct war work, and, as a result, up to the middle of this year we have not been able to get on with research and development work for post-war activities. At this point I should mention the great help we have received from the directors of the various Government Departments with whom we have had to deal. It has been a pleasure to work with them.

It probably would not interest you to give a complete catalogue of the enormous range of items which we have manufactured which come into the category of Telecommunication Equipment, but I think it will be of interest to put on record the approximate totals of some of the principal items we have manufactured:—1 300 000 microphones; 1 200 000 receivers; 920 000 telephone sets; 70 000 switchboards of all sizes up to 200 lines. In addition to this the large quantity of component parts produced is interesting:—11 500 000 condensers; 1 000 000 iron dust cores; 2 000 000 key switches; 2 500 000 plugs; 2 250 000 jacks; 15 000 000 coils of various sorts. The amount of wire used on the last item was approximately 12 500 000 miles.

Tribute to Staff and Workpeople

During the period 1940 to December 31, 1944, our output grew, expressed in terms of value, from just under a million in the first years to over two millions. This output was achieved with an increase in factory floor space of only 10 000 sq. ft. plus a small outworking unit as compared with the factory floor space we had available in 1939, and at this point in my address I feel it is only right to pay tribute to our General Works Manager, Mr. P. B. Healey; his assistant, Mr. H. Lovesey, and our Chief Engineer, Mr. J. G. Flint, for these results could not have been attained without their untiring energy and organising ability. At the same time I would also pay tribute to the rest of our staff and workpeople for the extraordinary effort they have made during the war years, in spite of the fact that all our works are situated in that part of London which during the blitz by V1 and V2 was known as "Southern England." The courage and devotion of the men, and particularly the women, has been most praiseworthy, for although we had incidents all round us they carried on their work during warnings with hardly a break. In order that you should appreciate their courage, in the short space of 24 hours our roof spotters recorded 167 flying bombs within sight and many dropping in close vicinity to our main works. It is due to this devotion to duty that our production costs invariably compared favourably with similar undertakings, and, what was even more important, our delivery promises were strictly maintained. In

spite of blitzes our total output expressed in sterling for the period 1940/1944 inclusive amounted to £7 878 000, therefore I think the tribute I have paid to our employees will in your opinion be well deserved.

Considerable Work in Hand

Now as to the future. I am sure you will not expect me to prophesy, for a great deal depends on the removal of the innumerable control orders to permit private enterprise to get busy once more. I can, however, see fairly well into next year, for we still have a considerable volume of work in hand. We are also able, at long last, to direct some of our research and development engineers on to work for post-war sales. Almost without exception the whole of the development and research work we carried out up to the end of 1939 has been very valuable to us in some form or other in the war work we have been doing. We have established a first-class reputation for the quality of our work and our ability to keep delivery promises.

Incidence of E.P.T.

You will have appreciated by the past several years' accounts that we have had to pay very considerable amounts in E.P.T. On the other hand this is providing us with a very useful cushion, though you must bear in mind that the cushion is still liable to income tax, but in spite of this the amount will be quite substantial. I express a very fervent hope that this tax will be abolished at a very early date, for in spite of the concessions made by the Chancellor of the Exchequer in his last Budget, we will have to find a considerable sum for what I might term the rehabilitation of our plant which has been working night and day during the war. The present high taxation is a great brake on private enterprise and it is imperative that there should be some alleviation of this burden at the earliest possible date. It must not be forgotten that enormous sums have been invested in War Loan and National Savings and that to meet the interest the national credit is at stake. This debt can only be met through the Government giving private enterprise every encouragement to develop trade at home and abroad and thus place our country in its former sound financial position, for income tax on earnings and profits is still the biggest source of Inland Revenue.

The report and accounts were unanimously adopted and the dividend recommended was declared.

Commercial Information

County Court Judgments

NOTE.—*The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be actions. But the Registry makes no distinction. Judgments are not returned to the Registry if satisfied in the Court books within 21 days.*

STANSONS ELECTRIC AND RADIO CO., 111, Wood Street, Walthamstow.

ARONSBERG, CHAS. AND CO., 20, Manchester Street, Liverpool, electrical dealers. £31 11s. 3d. June 7.

MCKENNA, Lucy (married), 81, Stratford Road, Heaton, Newcastle-on-Tyne, electric welder. £21 13s. 9d. June 7.

BAILEY, H. AND SON, 177, Church Road, Hove, radio dealers. £12 2s. May 30.

Mortgages and Charges

NOTE.—*The Companies Act of* 1908 *provides that every Mortgage or Charge shall be registered within* 21 *days after its creation, and that every company shall, in its annual summary, specify the total amount of debt due from it in respect of mortgages or charges. The following mortgages and charges have been registered. The total debt prior to the present creation, as shown in the annual summary, is given—marked with an *—followed by the date of the summary, but such total may have been reduced.*

DAVEY, PAXMAN AND CO. LTD. (formerly DAVEY, PAXMAN AND CO. (COLCHESTER) LTD.), Colchester, engineers.—June 25, £380 mortgage, to Colchester Permanent Benefit Building Society; charged on 32, 71 and 72, Hythe Hill, 1, 2 and 3, Foundry Yard, 15 to 23 (inclusive), St. Leonards Road, and 9, Stanwell Terrace, all Colchester. *£54 080. Aug. 17, 1944.

H. TINSLEY AND CO. LTD., London, S.E., instrument makers.—June 29, charge, to Temperance Permanent Building Society securing £2 000 and any other moneys, etc.; charged on Alton Lodge, Freshwater, I.o.W. *Nil. March 30, 1944.

MODERN TELEPHONE CO. LTD., London, W.—June 29, £5 000 debs.; general charge. *Nil. Dec. 28, 1944.

Metal Prices

		Monday, July 23. Price.	Inc.	Dec.
Copper—				
Best Selected (nom.)	per ton	£60 10 0	—	—
Electro Wirebars ...	„	£62 0 0	—	—
H.C. Wires, basis ...	per lb.	9 7/16d.	—	—
Sheet	„	11 1/16d.	—	—
Phosphor Bronze—				
Wire(Telephone)basis	„	1s. 0 1/16d.		—
Brass (60/40)—				
Rod, basis	„	—	—	—
Sheet „	„	—	—	—
Wire „	„	11¼d.	—	—
Iron and Steel—				
Pig Iron (E. Coast Hematite No. 1)...	per ton	£7 13 6	—	—
Galvanised Steel Wire (Cable Armouring) basis 0.104 in. ...	„	£28 5 0	—	—
Mild Steel Tape (Cable Armouring) basis 0.04 in. ...	„	£20 0 0	—	—
Galvanised Steel Wire No. 8 S.W.G. ...	„	£26 0 0	—	—
Lead Pig—				
English	„	£31 10 0	—	—
Foreign or Colonial	„	£30 0 0	—	—
Tin—				
Ingot (minimum of 99.9% purity) ...	„	£303 10 0	—	—
Wire, basis... ...	per lb.	3s. 10d.	—	—
Aluminium Ingots ...	per ton	£85 0 0	—	—
Spelter...	„	£31 5 0	—	—
Mercury (spot) Warehouse	per bott.	£69 15 0	—	—

Prices of galvanised steel wire and steel tape supplied by the C.M.A. Other metal prices by B.I. Cables Ltd.

TEST INFLATION OF AIRMEN'S DINGHIES BY HOOVER BLOWER

Inflation is the test for seaworthiness. But deflation is the test for airworthiness. That is because any air remaining after test would expand at high altitudes, and a dinghy inflating itself on the wing of his aircraft is no help at all to a bomber pilot.

However, the Hoover Blower both inflates and deflates — and deflates completely. It's one of the many jobs these versatile Hoover machines have been doing in the war.

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