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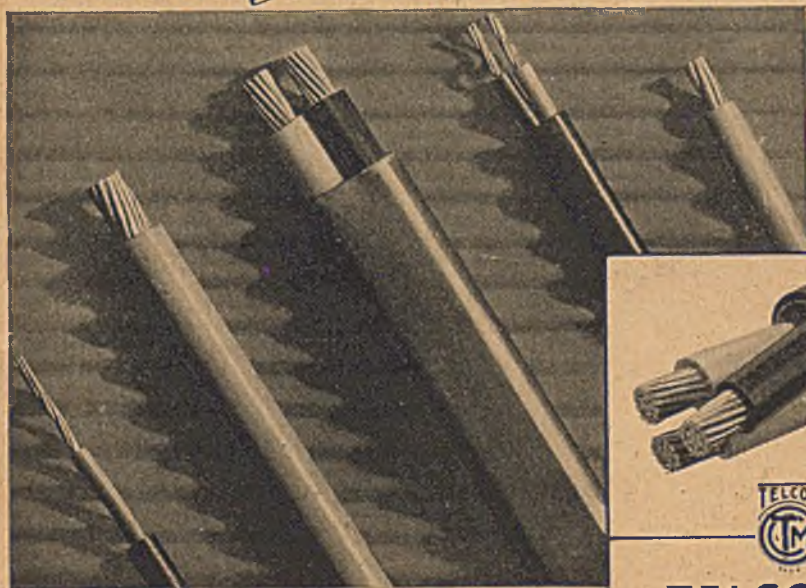
Vol. GXXXIV. No. 3491.

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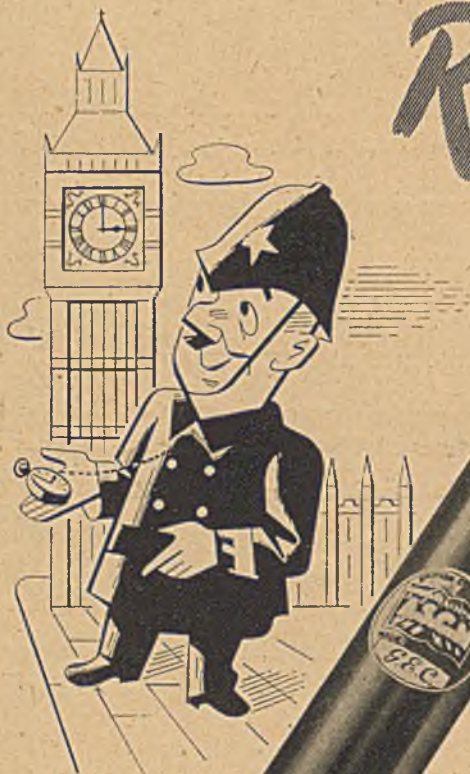
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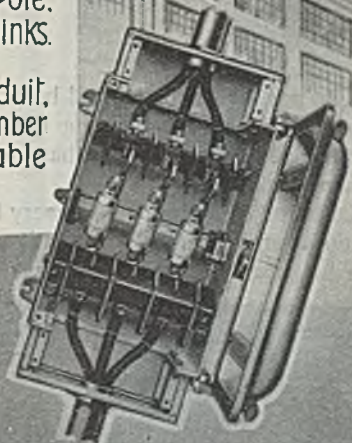
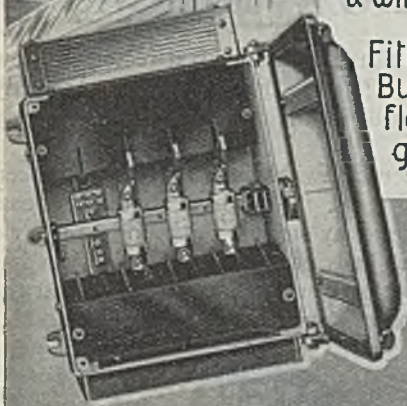
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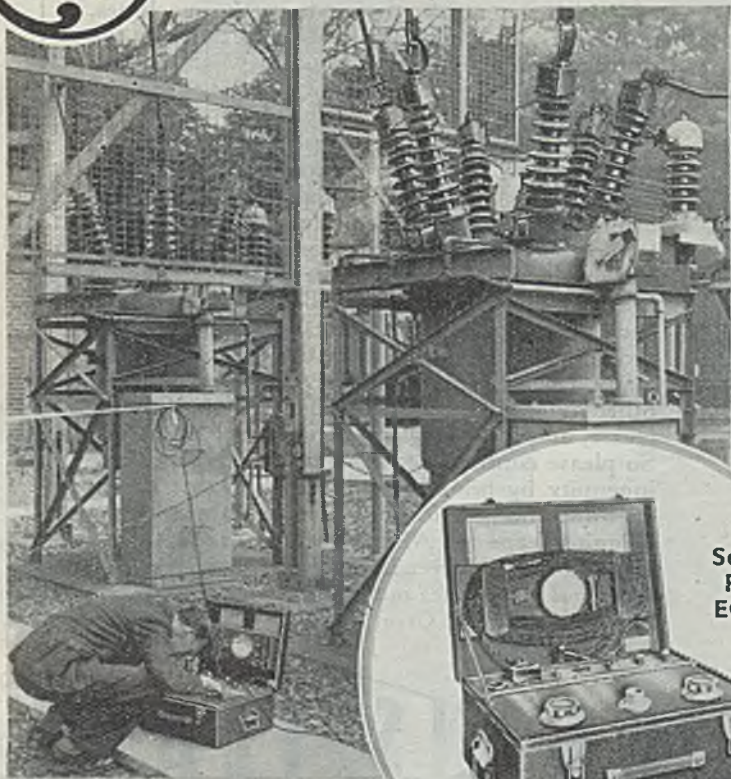
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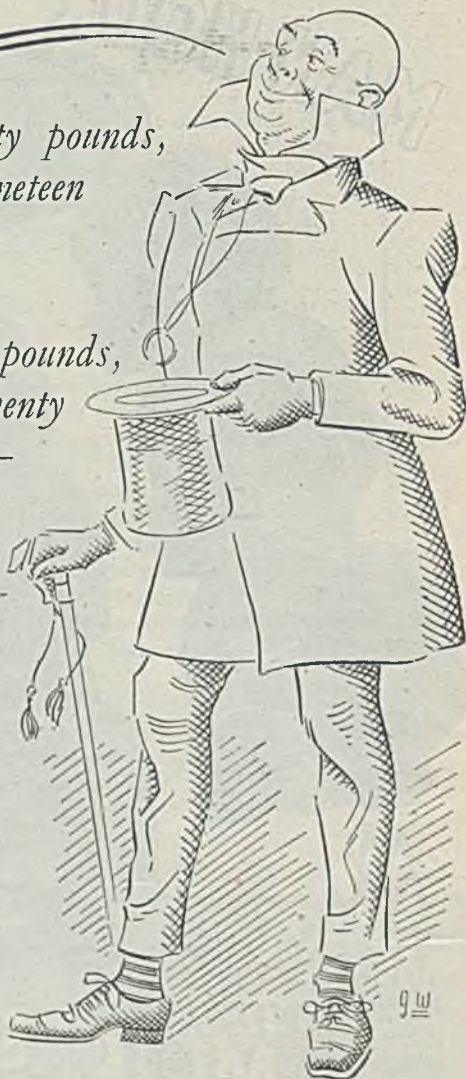
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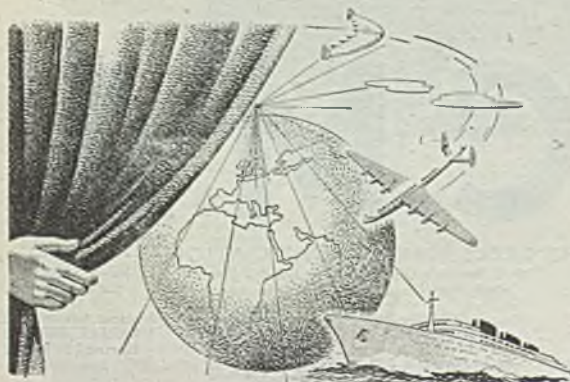
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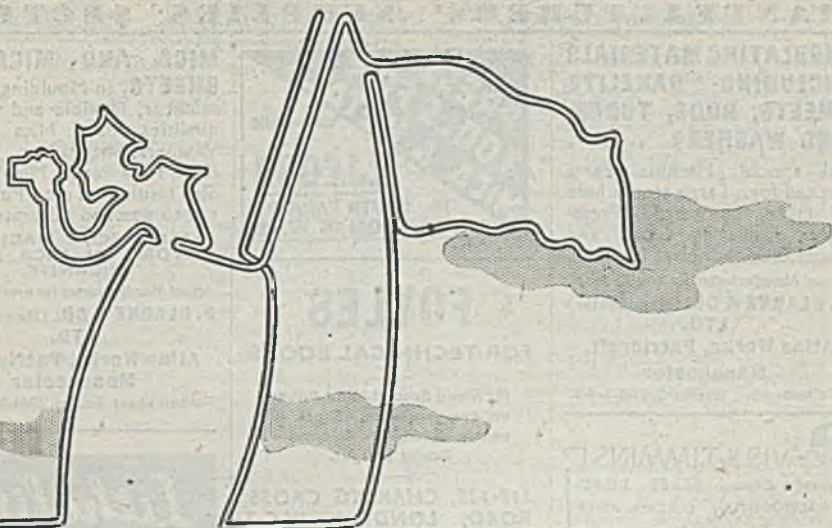
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The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and to determination by the giving of three months' notice in writing on either side. The successful candidate will be required to pass a medical examination.

Applications, on the forms provided, enclosed in an envelope endorsed "Engineer and Manager, Electricity Undertaking," must reach the undersigned not later than 10 a.m. on Tuesday, the 22nd day of May, 1945.

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Department "C."
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and should be returned duly completed, endorsed "Technical Editor," Dept. "C," not later than FRIDAY, MAY 18th, 1945.

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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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April 27, 1945

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Overseas 30s.

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More Light, Less Danger

THE most cheering event of the week on the home front has been the complete removal on Monday of all restrictions requiring the limitation of light from houses, business premises and industrial buildings, except for a five-mile deep coastal belt that must remain blacked-out for the safety of our shipping. The black-out was one of the most depressing and irksome features of the war, and even when it was modified last September, it did not dispel a murky gloominess outside, or the feeling that danger still lurked somewhere over the horizon. Now that danger, although not completely obliterated, has become so remote as to be almost negligible; and the restoration to the householder of the right to switch on the lights and open the windows if he so desires, has done much to lift up the hearts of the public. It is an unmistakable sign that victory in Europe cannot be long delayed and the dark clouds that have obscured the future are being dispersed.

Another comforting prospect in view is the resumption at the expiration of

Double-Summer Time of full street lighting. As a measure of fuel economy lighting authorities are being asked again to put out their street lamps from May 1 to July 15, and they are being advised to use this period for the completion of their preparation for the big switch-on. Whether they will be able to restore public lighting to pre-war standards so soon depends largely upon the availability of labour and materials, but some authorities are already in a position to do so at short notice. The urgent necessity to use every means to reduce the appalling toll on the roads should spur everyone concerned with public lighting to do everything possible to achieve a high standard of effective illumination. Alternate patches of light and shade are more dangerous than total darkness and must be avoided. Before the war, where modern standards of lighting had been adopted and main roads were well lit, there was a falling night accident rate. Since then illuminating engineers have added to their technical knowledge and experience, and, no doubt, this will be reflected in post-war schemes.

Another aspect of lighting is in connection with the statement made by Sir WILFRID GARRETT, on Monday, at a conference on industrial accident prevention, when he pointed out that in the five years, 1939-43, there were in factories alone 6 705 fatal, and 1 250 000 other accidents causing absence from work for more than three days, and many more in which there was loss of time; costing in loss of production, damage to plant, etc., something approaching £70 000 000 a year. Such a record is due in large measure to the employment of many operatives unused to factory conditions, long hours of work and high speed of production, but its volume would, we feel, have been less had better lighting been



used in many of our workshops. The dangers of bad or inadequate lighting have been accentuated by the conditions imposed by war-time production, and the publicity given by the national Press this week to the whole subject of lighting will, it is hoped, do at least something to convince the die-hards that good lighting is not an electrical stunt kept alive by industry to sell lamps, fittings and current, but is something conditional to good workmanship, essential to high economic output and, above all, a sound insurance against a rising accident rate.

An Interim Budget

THE Chancellor of the Exchequer made it clear on Tuesday that the stage had not yet been reached when major reductions in taxation were permissible, first because it would be dangerous to increase the pressure of purchasing power before a corresponding increase in the supplies of consumption goods; secondly, because justice could not be done until the system of taxation as a whole could be reviewed in relation to the probable course of expenditure after the war. He stressed, however, that this must be regarded as an interim Budget, and while he did not indicate precisely when a further budgetary review would be possible, he thought that it might "well arise after less than the normal interval." Such tax concessions as he was able to make are of chief interest to the small trader, and so far as E.P.T. relief is concerned, will have the effect of raising the exemption limit by a further £1 000 to £3 000 and the personal standard for the single worker proprietor from £2 500 to £3 450. Industry, of course, would have been glad of more all-round encouraging treatment now, but the promised early review of the position is at least hopeful of better things to come.

The I.E.E.

THE Institution of Electrical Engineers is in the forefront of the news this week, in that amendments of the bye-laws have now been made public, the Kelvin Lecture was delivered yesterday, and, as a sign of the times, the portraits which used to hang in the Lecture Theatre have been taken out of their war-time hide-out and have returned to their rightful places. One regrettable feature, however, is that for reasons of national security, details of Sir EDWARD APPLETON'S address may not be published, and

since the subject matter deals with radio-location this may be understandable. The popularity of the address was a foregone conclusion, and though the I.E.E. anticipated an outside attendance by providing accommodation in addition to the theatre, the capacity of the building was taxed to the full. It is obvious that those who were unable to attend at the I.E.E. yesterday, will have hoped to have read an abstract of the Kelvin Lecture in our next issue, but in view of the heavy hand of censorship, their hopes can be satisfied in no other way than by a second reading of the lecture. At the time of writing it is understood that arrangements for such second reading are being made, but details at the moment are not available.

Cheshire Farmers and Electricity

THE Cheshire County Branch of the N.F.U. at a meeting on April 5, considered replies to a questionnaire sent to farmers in the district, and with the consent of the Chairman of the Technical Committee of the branch, Mr. S. E. BRITTON, engineer and manager, at Chester, has sent us a copy of the replies. As might be expected, and as the industry already knows, the general opinion of farmers is that electricity service in rural areas is inadequate. On the question of installation charges opinion is fairly divided between what is considered excessive and what is considered reasonable, while unit charges are in the main regarded as high. All branches reported satisfaction with the maintenance service offered, showing that farmers in the area are at least appreciative of what electricity can do. As we have said before, there is much hard work to be done in the rural electrification field before either the industry or the farmer is convinced that a real state of development has been established, but the type of questionnaire which is the subject of this note is useful in arriving at some sort of opinion on how ready the farmer is willing to accept electrical service without further education in the uses and advantage it offers.

War-time Record of the Telephone

AMONG the many remarkable records of maintenance of service during the war, has been that of the public telephone, and though we have already referred to the matter, it has, until now, not been possible to do more than hint at what has been done. Among the most

affected areas was London, the early bombing of which was anticipated by the Post Office engineers before the war, and some brief details of the measures adopted have now been released. To safeguard the trunk service, for instance, a large centralised exchange was provided in a building protected by concrete so thick that it was considered to be bomb-proof. Six centres were established on the outskirts of London so that circuits could be cut at these points if necessary. Some 1 200-trunk circuits were connected to the centralised exchange, and about 500 to the outer exchanges. Many of the vital defence lines were run through the tube railway tunnels, and Post Office engineers drove several miles of tunnels in Central London at a very deep level to secure immunity for certain important services.

Sir Ambrose Fleming

IN the death on April 18 of Sir AMBROSE FLEMING, F.R.S., the industry has lost yet another link with the pioneering days, for much of his work was concerned with the development in this country of the telephone and the incandescent electric lamp, together with the invention of the thermionic valve. At the time when the electric lamp and later certain radio devices became subject to long legal debate, his expert evidence often played a decisive part in bringing the actions to a conclusion, and in a museum which the Edison Swan Electric Co., established before the war, many examples of his early work, both with respect to lamps and valves were to be seen. His name will also be remembered in connection with the transmission of high tension a.c. from Deptford to London, developed by the late Dr. FERRANTI, while the generation of power from the waters of Niagara also attracted his attention. In the years immediately before the war he displayed a considerable interest in television and his lectures before the Television Society in those days were among the most informative we have attended.

Cable Makers' Merger

THE proposals put forward for a fusion of B.I. Cables, Ltd., and Calender's Cable and Construction Co., Ltd., are based on the conviction of the directors of both companies that such amalgamation will not only assist in maintaining their trade in future years, but will strengthen their export position, as

well as ensure stability of employment. The two companies, whose names are household words in the industry, have been trading competitors in the best sense, and for many years have, as is generally well known, co-operated in the scientific improvement of their products and methods of manufacture. On the score of equity the treatment in the proposals of the various classes of shareholders of the two companies, outlined by the broad terms at present available, appears to be fair and should meet with the approval of those concerned. It is proposed to form a new company to acquire the existing undertakings, which later will be wound-up voluntarily, and though some details of the proposals will be found elsewhere in this issue, the acceptance of them is to be determined at a meeting, the date of which is not yet announced, but the proceedings of which will be followed with special interest.

Electricity in Northern Ireland

THE future of electricity generation in Northern Ireland has again been the subject of discussion between the Ministry of Commerce and the Belfast Corporation, with the result that certain points in the original heads of agreement have been clarified, and a memorandum issued. Details of the statement will be found elsewhere in this issue, and it is generally conceded by both parties that the formation of a new authority responsible for generation and transmission only, would result in a saving of possibly of 30 000 kW of stand-by plant, representing a saving in capital expenditure of upwards of £1 000 000. It is understood that the new authority would give full consideration in producing any future scheme for Northern Ireland, to the possibilities of hydro-electric development and the results of any such investigation—which are outside the province of, for example, the Belfast undertaking—might possibly be of assistance, not only as stand-by plant available at a moment's notice, but as a source of cheaply generated energy supplementing the existing steam-operated stations. The suggested creation of a Northern Ireland authority to assume duties generally corresponding to those exercised by the Central Electricity Board, is, apparently, being received with mixed feelings and constructive criticism.

I.E.E. Bye-Laws

Some Notes on Amendments—Election and Transfer of Members

IT is not generally known that the Institution of Electrical Engineers is the largest learned institution in the world. Its total membership of all classes on April 1 was 26 665, and within two months the 27 000 mark will be passed. There are 2 587 full members and 9 978 associate members, so that the corporate membership is well over 12 500. The institution leads its American counterpart by 5 000 members, and one thing the British I.E.E. has that the American body has not is a rigid standard of professional qualifications, though the Americans have their standards that are strictly observed. This interesting information was given by Mr. W. K. Brasher, the secretary of the I.E.E., at a Press conference on April 19, when amendments to the institution's bye-laws were discussed.

Corporate Members' Responsibility

The revisions now brought into force mark another stage in the development and history of the institution. A group of amendments to that part of the bye-laws relating to the election and transfer of members, modify that procedure by placing full responsibility upon the Council, and bring about changes that will ensure that corporate members throughout the country will have an opportunity of considering the Council's recommendations for elections and transfers before the final decisions are made, and the sequence of elections and transfers is no longer rigidly tied to the sequence of ordinary meetings. The previous procedure had been criticised on three grounds, namely: (1) that by limiting participation to those members who might happen to be present at the institution at the time the ballot was conducted, it had not afforded a representative mechanism; (2) that knowledge of proposed elections and transfers was confined to those visiting the institution; and (3) that, since the procedure for election and transfer had been tied to the programme of ordinary meetings, the smooth progress of elections and transfers throughout the year had been hampered by the periods during which no ordinary meetings were held. There was also the danger of an election being affected by personal prejudice. The number voting might be extremely small, and with a secret ballot there was a risk that a man might be refused professional recognition for no reason that could be ascertained. As few as a couple of votes could have prevented an election.

Another group of amendments affects

the constitution of the Council. The number of vice-presidents is increased from four to five and the period of office may be extended from three to six years. This will have the effect of keeping a vice-president in close and continuous touch with the work of the institution to the date on which he might become president. Another change makes the council really representative of all sections of the profession in the institution and gives the local centres and specialised sections a bigger voice on the council. It provides that in the list of persons nominated by the Council for vacancies in the office of ordinary members of the Council not less than half of the names shall be those of persons who have not previously served on the Council in any capacity, but a person who has only served in one or more of the offices of chairman and past chairman of a local centre of a specialised section for a total period of not more than two years shall for the purposes of the bye-law be deemed to be a person who has not previously served on the Council. The voting power of past presidents is strictly defined to prevent any possibility of the Council being swamped by the somewhat long list of past presidents.

In bye-law 42, which governs the professional conduct of consultant members, has been incorporated a statement establishing an ethical code or standard of conduct for every member of all classes. It is not enforceable, but is rather a statement of the behaviour expected of every member of the I.E.E. It is felt it is preferable to have a general statement of that kind in the bye-laws.

Because the rigidity of the wording of the bye-law under which subjects of enemy countries cease to be members of the institution led to a number of decisions which had proved harsh and might have inflicted hardship, an amendment has conferred upon the Council the right of discrimination.

Dover's Jubilee.—At the Dover undertaking's jubilee celebration luncheon on Monday, Major Gwilym Lloyd George said that throughout all the shelling and bombing of the town electricity was supplied to every house in the area. The department also gave essential supplies to all three fighting services for radiolocation, prediction equipment, ships supplies, and for the operation of the coastal defence batteries and Channel guns. Tribute was paid to all those employed in gas and electricity undertakings.

Electricity in France

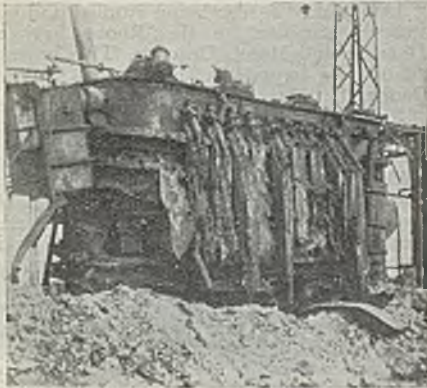
Rehabilitation and Development—Water Power Prospects

THE Ministry of Reconstruction has a wide plan for the complete electrification of France in which even the most humble cottage will not only be wired for

regions of France, and using any provisional means possible. An improvement in production, due to the spring rains, has enabled engineers to pay more attention to Alsace, till now neglected and without electricity.

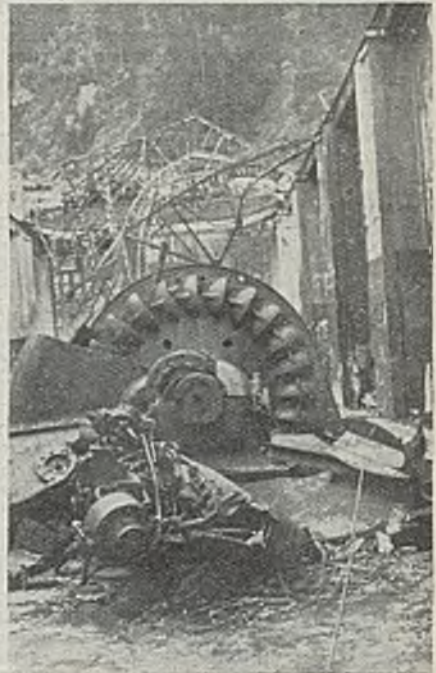
Production at the moment is between five and six million kWh per day. This shows a slight falling off due, partly, to the repair and reconstruction work being carried out at Mareges.

The vision of the Ministry of Reconstruction is very wide and foresees eventual



Transformer at Distre destroyed by the Germans in August, 1944

lighting but also for cooking and heating and cheap rates. The Syndicate of Power Producers is in complete agreement with the plan, but is making certain objections about the way in which it is to be carried out. It says, for example, that the power projected for domestic use is excessive. At the moment talks are still going on. Also proceeding is the work of reconstruction,



German destruction of No. 3 turbine of the Bisson plant

power production by hydraulic plant, at 30 milliard kWh per year. Great attention is being paid to current production by water power because of the present coal situation, which may or may not improve with time. It is doubtful whether France will be able to import coal for her needs in the same quantities as before the war. Because of this, every possible water source will be tapped.

New transport methods from the Alpes and the Pyrénées are to be installed and when completed, these will increase produc-



Provisional overhead line erected in the Godin Rueyres network, after the liberation by the Allies

although most of this is of a temporary nature at the moment. It is simply a question of getting power to the destroyed

tion by about 10 milliard kWh per year. Coal economy is also to be studied and further changes (many were made before the war) and modifications of thermic plants are to be included in the programme.

Damage to the Kembes plant, inflicted by the Germans before they retreated, is serious. On the south side of the barrage



Work of the resistance movement in France. The line illustrated on the previous page was erected to overcome the damage

two sluice gates were blown up and there has been a serious drop in the water level. Work at Kembes will last from six months to one year.

The present programme of reconstruction and new construction is known as the 1933 plan and includes work on the Aigle plant (400 million kWh) and Genissiat (1 500 kWh). This work will not be completed before 1946, and the Genissiat plant will

probably not be ready for service before 1947.

A new programme, known as the "1941 plan" will soon come under consideration. It is expected to add some 4 500 millions kWh to French production and will include barrages at Saint-Pierre-Champs on the Isere, at Bort, and at Chastang on the Dordogne.

Another programme, known as the "1945 plan," is also being studied and will include barrages on the Rhone between Donzere and Month-Dragon. This barrage should be equal in power to that of Genissiat.

Finally a barrage will be built in Granville bay. It will be 150 kilometres long and will use the tides to produce 60 milliards of kWh. Work on all these plans will last about 20 years and is expected to cost between 200 and 300 milliards of francs. Granville bay is said to be the only bay in Europe where the sea is powerful enough to be used for energy production.

A few small plants were completed during the occupation, and the one at Saint-Etienne-Cantales is now in use. This barrage is on the Cere, is 71 metres high and 270 metres long. It has three groups of generators capable of producing 25 000 kW, two groups have been installed already and one is about to be installed. Its production will be 90 000 kVA and 225 millions kWh.

The Fannich Hydro-Electric Scheme

UNDER the Fannich project, which is the third construction scheme of the North of Scotland Hydro-Electric Board, it is proposed to convey the waters of Loch Fannich in the county of Ross and Cromarty by means of a tunnel and pipeline to a power station at Grudie Bridge in Strath Bran. The railway line from Dingwall to Kyle of Lochalsh runs along Strath Bran and the power station will be on the opposite side of the valley from it and about a mile west of Loch Luichart railway station. The approximate capacity of the generating plant to be installed is 24 000 kW, and the system of generation will be three-phase a.c. at a frequency of 50 cycles per second. The estimated cost of the project is £1 000 000. This is the first scheme to be published for the northern part of the Board's area and it is designed to attract industries to the north.

The Grampian E.S.C. are already the authorised undertakers for the distribution of electricity in the eastern parts of Ross-shire. It was recognised by the Cooper Committee that the general growth of load there must be met by additional power, and the Board had discussions on the matter with the Grampian Company when the scheme was first surveyed.

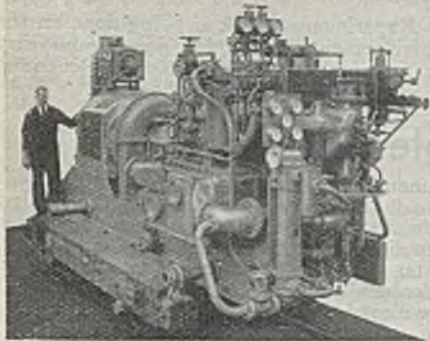
The Hydro Board's policy is not only to meet the immediate domestic and industrial needs of Ross-shire and Inverness but also to provide for major developments in the future. Great water power resources have still to be harnessed in the northern counties and the Board are well ahead with their plans to keep in advance of the demands of new and growing industrial developments.

It is also the Board's duty, under the Hydro-Electric Act, to construct a grid for the North of Scotland. The intention is to interlink the Fannich station and others in the north with the proposed Tummel-Garry scheme and with Aberdeen, so as to form a backbone from which the development of the area can be built up. The Great Glen from Fort William to Inverness and beyond into Ross and Cromarty and Sutherlandshire comprises an area which has great potentialities for development. The Board look forward to a time when large power schemes on both sides of the Great Glen will feed trunk lines carrying electricity to industries situated near the railways and deep-water harbours of Corpach, Inverness and the Cromarty Firth. They are giving preference to Scottish manufacturers and labour.

What Manufacturers are Doing—VIII

Meeting War-Time Demands—Allies and Services Supplied

THE war-time demands made upon the resources of the General Electric Co., Ltd., has necessitated greatly expanded production facilities and many new premises have been erected during the last



One of a number of 500 kW transportable turbo-alternators supplied to the U.S.S.R.

few years while the company has, too, been entrusted with the management of specialised Government factories.

Among large turbo-generating units built by the company recently were a number for Russia, several 37 500 kVA, 3 000 r.p.m. sets for C.E.B. stations and two for South Africa. Of seven sets of this rating now in hand, four are for the Meaford station of the North-West Midland J.E.A., one for Kingston-upon-Hull, one for Woolwich and one for the Newport Corporation.

A notable addition to the turbine works equipment is an electric furnace for treating turbine shafts at high temperatures and for the rectification of faults.

To meet the big demand for portable generating sets for Service use many large contracts have been undertaken.

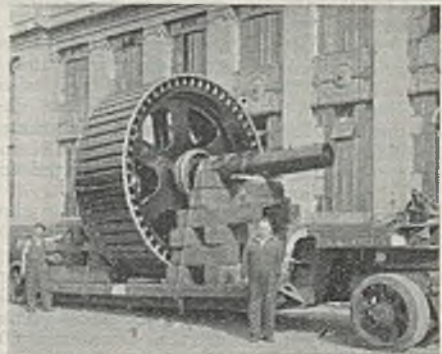
There have been numerous applications of the pumpless air-cooled steel tank mercury arc rectifiers in war industry and transport, and for the latter service three pumpless rectifiers, each of 1 500 kW capacity, have been successfully applied to main line railway electrification, and for fully automatic multi-unit sub-stations installed for trolley 'bus working.

Included in the considerable quantity of electrical machinery supplied by the company to Russia were three 31 000 kVA and three 15 000 kVA turbo-alternator sets, as well as a number of 500 kW transportable power units, each of the latter embodying a turbo-alternator, switchgear and transformers. The G.E.C. has been responsible for a complete power station

for the U.S.S.R. beginning with the coal handling plant and finishing at the h.t. switchgear, the generating unit at present consisting of one 15 000 kVA turbo-alternator. For electro-chemical use three motor generator sets comprising a synchronous motor driving two d.c. generators giving a total output of 10 000 A at 230/280 V were built; all the machines are forced ventilated through trunking in which air is circulated by a motor-driven fan. A number of motors supplied includes a range of flameproof squirrel cage machines rated at 125 h.p. at speeds from 1 460 r.p.m. to 730 r.p.m.

Many notable switchgear schemes have been undertaken; two of these are for British Dominions, one consisting of 36 units of 33 kV 1 000 MYA metal-clad units for the Pyrmont Station, Sydney, and the other of 150 "Subgear" units.

Of the vast amount of work undertaken for the Admiralty, mention may be made of contracts for cargo ships. The most outstanding was for the propelling and auxiliary equipment for four such vessels. The main items for each ship comprised a



Magnet wheel of a 6 800 S.H.P. synchronous ship propulsion motor in course of transport

6 800 s.h.p., 115 r.p.m. synchronous propelling motor, the complete propulsion control equipment, a 5 300 kW, 3 100 V turbo-alternator running at 3 000 r.p.m.; also a 400 kW, 220 V d.c. geared turbo-generator for supplying auxiliary services, and many auxiliary motors and starters.

Most of the electrical equipment for five other large cargo ships was also manufactured by the G.E.C.

The several larger dock electrification schemes undertaken included one for the graving dock at Sydney, for the Australian Commonwealth Government.

Of a variety of transformers manufactured, one with a B.S. rating of 37 500 kVA was for the State Electricity Commission of Victoria. Cooling is by means of forced oil circulation water cooled. Twin coolers are provided, each capable of dissipating the full load losses of the transformer.

Electrical machines possessing many interesting features have been made in large quantities for various purposes associated with aircraft service. One of these is the camera control motor, largely used for driving the mechanism which enables reconnaissance 'planes to take a series of accurately timed photographs; closely

allied is a camera motor for driving the miniature cinema camera which photographs the results of gunfire from a 'plane. A third type of motor provides the power for the Mark XIV bomb sight.

Other equipment supplied to the Services included anti-submarine devices, de-gaussing plant; land mine detectors; cathode-ray tubes; floodlight, beacon and light-house units for aerodrome service, and so on.

Experimental work is being done on the development of clear, low pressure mercury tubes capable of emitting ultra-violet radiation for killing airborne bacteria.

I.E.E. Benevolent Fund

THE report of the Committee of management of the I.E.E. Benevolent Fund for 1944 stated that the capital account at the end of the year stood at £35 983 as against £33 971 for the previous year. A transfer of £2 000 from income to capital was made. The income amounted to £9 138 10s. 11d. made up of £1 497 10s. 8d. from dividends and interest, £1 266 18s. 7d. from subscriptions and donations of £5 and over, £5 374 1s. 8d. from subscriptions and donations of under £5, and a legacy from the late Sir Horace Boot of £1 000. In 1943 the income amounted to £8 077.

Applications for assistance were made by or on behalf of 80 persons during 1944. In assisting these persons the fund also provided for the necessities of 63 dependants. The total amount of the grants was £4 700, compared with £4 773 in 1943, and the average amount granted to each beneficiary was £58 15s.

The number of contributors during the year was 9 662, representing nearly 40 per cent. of the total membership. The average amount of contributions per subscriber was 13s. 9d., but for the total membership it was only 5s. 2d. The Committee appeals to the remaining 60 per cent. of the membership, who do not subscribe, to support the fund and states that further donations are most urgently needed.

It is mentioned that the Council have agreed to a proposal of the Committee of Management that a special fund be opened for the development and building of a residential estate where some of the beneficiaries of the fund could live. Owing to the restrictions on the building of private property, the development of the estate must be delayed for a few years, but it is estimated that the cost of the land and buildings would amount to about £50 000. The amount of contributions received so far is £114.

Grants made from the Wilde Fund,

amounted to £121. A grant of £78 was made during 1944 from the Lord Hirst Fund, the object of which is to assist those applicants for help (or their dependants) who have rendered important services to electrical science, the electrical industry or electrical engineering, whether members of the institution or not.

Northern Ireland

THE future of the generation of electricity in Northern Ireland has again been discussed by representatives of the Ministry of Commerce and the Belfast Corporation as a result of which certain points mentioned in the original heads of agreement have been clarified.

The original agreement provides for the creation of a Northern Ireland authority to assume duties generally corresponding to those now exercised by the Central Electricity Board in Great Britain and also by the Electricity Commissioners, subject in the latter case to the general directions of the Ministry; the authority to be responsible for the adequate and efficient production of electricity to meet the needs of Northern Ireland. The authority is to purchase at cost of production all electricity generated in Northern Ireland and to resell to undertakers at equitable tariffs. The authority will have power to direct the operation of generating stations as to quantity and rate of output and times of operation, and power to acquire generating stations by agreement or by compulsion in cases where stations are considered to be not operated according to their requirements.

The assurance is now given that Belfast can never be charged more per unit than it would have cost Belfast to generate for its own requirements, and in the event of the authority requiring the generating station, Belfast would continue, as at present, to develop and control the distribution and sale of electricity.

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.

Mr. S. F. Philpott has joined R. B. Pullin and Co., Ltd., as fractional H.P. motor development engineer.

E. K. Cole, Ltd., announce that **Mr. W. W. Syrett** has joined the company as export manager.

Mr. J. H. Mahler has been appointed a director of Alfred Herbert, Ltd., in place of **Mr. Ralph Jackson**.

Mr. A. C. Holmes has been nominated as next chairman, with **Mr. R. Oliver** as vice-chairman by the I.E.E. North Midlands Students' Section.

Mr. G. E. Taylor has been appointed a managing director of the Electric Furnace Co., Ltd., jointly with the present managing directors, **Mr. D. F. Campbell** and **Mr. W. S. Gifford**.

Major C. M. Carington, director and general manager of K.L.G. Sparking Plugs, Ltd., has joined the board of S. Smith and Sons (England), Ltd.

Mr. R. J. F. Boyer has been appointed chairman of the Australian Broadcasting Commission in succession to **Mr. W. J. Cleary**, who resigned recently.

The Electrical Apparatus Co., Ltd., announces that **Mr. J. R. Walton** has been appointed managing director in order to relieve the chairman, **Mr. R. H. Barbour**, of some of his executive duties.

Mr. Adam Oliver, of Arbroath, director Arbroath Electric Light and Power Co., left personal estate in Britain valued at £31 733.

The Minister of Supply has appointed **Mr. H. N. Butler** to be Director of Supplies (Special) in place of the late **Mr. R. R. Wilkins**.

Mr. W. J. Turner has resigned from the board of Franco Signs, Ltd., but will continue to act as sales manager of the company's sign business. **Mr. G. S. Campbell** (secretary), has been appointed a director.

Mr. E. C. Holroyde, joint managing director of Crompton Parkinson Ltd., has been elected chairman of the British Electrical and Allied Manufacturers' Association.

Mr. A. Brooks, as chairman, and **Mr. W. Wilson**, as past-chairman, have been nominated to fill vacancies that will occur in those offices of the Radio Group of the I.E.E. South Midland Centre in September.

Mr. F. J. Elliott, as chairman, **Mr. C. F. Partridge**, as senior vice-chairman, and **Mr. W. S. Burge**, as junior vice-chairman, been nominated by the I.E.E. South Midland Centre Committee for election in September.

Mr. G. F. Mansbridge, has relinquished

the chairmanship of Dubilier Condenser Co. (1925), Ltd., as he desires to be relieved of some of his responsibilities. He will remain a director. The deputy-chairman, **Mr. W. H. Goodman**, has been appointed chairman.

Mr. T. R. Thomas (Cardiff) as branch president, **Mr. T. G. Dash** (Aberargoed) as first vice-branch president, and **Mr. R. H. Morgan** (Tredegar), as second vice-branch president, have been nominated for election by the South Wales branch of the A.M.E.M.E.

The marriage has been solemnised at St. Nicholas Church Winchcombe, of **Dr. Herbert Vickers**, formerly Professor and Head of the Departments of Electrical and mechanical engineering, Vancouver, and **Miss Katharine Mary McDevitt**, daughter of Mr. and Mrs. William McDevitt, of Londonderry.

Representative French industrialists visiting this country on Wednesday, May 2, at the invitation of the Federation of British Industries will include: **MM. Ernest Mercier**, president of the Electrical Union; **Boutteville**, president of the General Syndicate for Electricity; **Lambert**, president of the General Syndicate for Engineering; and **Lente**, president of the Industrial Union of Metallurgy and Mining.

The resignation of **Mr. Arthur Hughes** as managing director of Henry Hughes and Son, Ltd., is announced as he completes fifty years of service. He will continue to serve both the Kelvin and Hughes companies as an advisory and consultative director. **Mr. F. A. King** and **Mr. G. B. G. Potter** have been appointed joint managing directors of Kelvin Bottomley and Baird, Ltd., and Henry Hughes and Son, Ltd.

On his retirement, after nearly 50 years' service with W. T. Henley's Telegraph Works Co., Ltd., **Mr. T. W. Middlemiss** received a presentation from his colleagues. In handing him this gift, **Sir Montague Hughman**, chairman of Henley's referred to the long and interesting career of Mr. Middlemiss, who began work in Henley's North Woolwich Works, and then went to the outdoor contract department. He was engaged as assistant engineer on many contracts at home and abroad.

The Committee of the I.E.E. Western Centre make the following nominations for the vacancies which will occur on September 30:—Chairman, **Mr. J. B. J. Higham**, lecturer in electrical and mechanical engineering, the School of Mines, Treforest, Glam.; first vice-chairman, **Mr. R. W. Biles**, operation engineer,

C.E.B., South-West England and South Wales; second vice-chairman, **Mr. J. B. Gwynn Lewis**, district manager, George Ellison, Ltd.

The following elections have been made by the board of the Institute of Physics:—

Fellows: A. E. W. Austen, R. Beesching, F. Bray, C. S. Bull, C. B. Childs, W. Deutsch, P. P. Ewald, H. G. Howell, L. Jacob, A. C. B. Lovell, K. A. MacLaden, W. Nethercot, S. Rowlands, A. Stratton, G. B. B. M. Sutherland, J. Tankard, V. Vand, J. R. Whitehead. Associates: G. F. Adams, H. I. S. Allwood, N. C. Barford, R. K. Barnes, P. R. W. Blewett, J. E. Caffyn, G. Cowper, A. G. I. Cressell, A. D. Denton, P. J. Doyle, P. J. Duncton, H. J. Dunster, J. T. Edmond, V. P. Gellay, W. F. Gibbons, R. M. Goody, B. Hall, R. W. G. Haslett, C. Henderson, J. C. Hickman, H. Hirsch, A. F. Howatson, H. G. Jerrard, J. E. Jones, K. Kellner, W. T. D. Lewis, M. P. Lord, P. Mason, K. Mayne, G. W. A. Morris, J. C. North, R. R. Osborne, W. Palmer, A. V. Parker, T. S. Popham, A. Quinton, F. B. Rider, I. A. Robertson, C. A. Schoute-Venneck, R. C. Seymour, F. Stanger, A. E. H. Ward, G. M. Wells, F. Wood, J. Walker.

Seventeen subscribers and twenty-four students were also admitted.

Mr. W. Bowen has presented to the Scientific Instrument Manufacturers' Association a substantial capital sum, the income of which is to be devoted towards the encouragement and development of invention, design, research, processes and

manufacturing technique in the scientific instrument manufacturing industry. The Council of the S.I.M.A. have drawn up a deed of trust under which the income from the trust fund will be devoted each year to prizes to be awarded to the employees of members submitting papers fulfilling the objects of the trust. For the current year five prizes to the value of £25 each will be awarded for a new invention; an improvement of design; an improvement in manufacturing technique; and a new development or new process arising from research. **Mr. Bowen**, who is governing director of the Bowen Instrument Co., Ltd., Cables and Plastics, Ltd., and Bowen Research, is shortly leaving on a twelve months' world tour on behalf of a number of concerns in the association, to establish contacts in export trade for post-war.

Obituary

Mr. William Wyld, electrical engineer, on April 18, aged 72 years.

Sir Gerald F. Talbot, aged 63 years. He was a director of the English Electric Co., Ltd., John Brown and Co., Kings Lynn Dock and Railway Company, London and North Eastern Railway Co., and of Whitehall Electric Investments.

Sir John Ambrose Fleming

Sir (John) Ambrose Fleming, F.R.S., on April 18, aged 95 years. He will be

remembered mainly as the inventor of the thermionic valve, but he was also associated personally with the introduction into this country of the telephone and the incandescent electric lamp. Sir Ambrose was Professor of Electrical Engineering at the London University for 41 years, and it was during that period that he carried out his investigations which revolutionised

the practice of wireless telegraphy and made wireless telephony possible. He retired from his professorship in 1926, and was knighted in 1929. It was in 1883 that Edison noted that negative particles of electricity escaped from the glowing filament of an electric lamp and could be captured by another electrode sealed within the vacuum and made in some way positive. This so-called "Edison effect" was investigated by a number of scientists, among them Fleming himself, who was then

scientific adviser to the Edison Electric Company of London. He made several improvements on the apparatus, though the inspiration of applying the discovery to the detection of high-frequency currents in wireless work did not suggest itself to him until 1904. His invention was patented in November of that year. Further inventions and investigations of Fleming have had a far-reaching influence on many other branches of electrical engineering and science.

His work won such coveted marks of recognition as the Albert Medal of the Royal Society of Arts in 1921, the Faraday Medal of the Institution of Electrical Engineers in 1928, and the Duddell Medal of the Physical Society in 1930, among many others. He played a great part in the early installations of electric light in London. He was lecturer on applied mechanics at Cambridge University before he became, in 1885, a Professor at University College, London. While at London University he founded the first really great electrical laboratory in this country. A paper of his, read before the Institution of Electrical Engineers in 1885, initiated the movement that brought about the establishment of the National Physical Laboratory. He was the author of numerous scientific works and some 90 scientific papers in the last 42 years.



Sir J. Ambrose Fleming

Electrical Affairs in South Africa

The Effect of the War on Extensions

THE consumption of current for all purposes in the area supplied by the Durban Municipality in the year ended July 31, 1944, showed an increase of 10 per cent. over the figures for the previous year. The increase in units actually sold was 8.6 per cent., the remainder being made up of units needed for street lighting, which cost about £40 000 and is at the expense of the electricity department. In the previous year, owing to the black-out restrictions, the consumption of current for street lighting was negligible. The total number of units consumed was 266 784 632, of which 148 320 808 was for domestic lighting, heating, etc., and this was followed by the 84 512 181 units needed for private power consumption. Municipal lighting and power took 14 883 656 units; tramways and trolley buses 7 034 115 units, and Government departments 8 659 053. For street lighting 3 374 818 units were needed. All these items represented an increase on the previous year's figures. There are now 37 253 consumers for lighting and heating and 3 660 of power, the first a 1.3 per cent. increase and the second a 4.6 per cent. increase. The total revenue of £885 577 was 11.1 per cent. higher than for the previous year.

Meeting Future Demands

A year of increasing difficulties was reported at the annual meeting of the East African P. and L. Co., held recently in Nairobi. Increased demand for electricity from plant which the company has been unable to extend has imposed a heavy strain on the staff. The increase in electrical consumption in 1943 compared with 1939 was. Kenya, 72 per cent., Uganda, 211 per cent., Tanganyika generally 72 per cent., Dar-es-Salaam and district 34 per cent. The gross profit for the year amounted to £141 543, allowing a total dividend of 7 per cent. to be paid on the ordinary shares and leaving a carry forward to 1944 of £36,903. The Chairman states that in view of projected extensions it will be necessary to raise the capital of the company to £1 500 000 by the creation of 250 000 additional 20s. shares, which, following the usual procedure, would be offered to present shareholders.

According to reports, the policy followed by the Bulawayo City Council since 1924 has established an electrical concern which, while fostering development, has constructed foundations which will assure that no matter what economic blizzards may rage, lower tariffs for all classes of consumption will be maintained. The undertaking is now

about three years behind with plant extensions and in order to ensure security of supply in the future it has been necessary to draw up new plans for the power station, which had been designed with a total capacity of 120 000 kW, and of which 15 000 kW had been ordered. Work on the first section, which will cost about £500 000, will begin this year and when completed the station will have cost about £3 000 000. It is regarded as almost certain that the new power station will be the last to be built in Bulawayo, for by the time the new and the old power stations are loaded to their safe limits it will be economically practicable to transmit power from the Zambesi.

Electrostatic Precipitation

In a paper presented to the Natal branch of the South African Institution of Certificated Engineers on electrostatic precipitators it is stated that these have cost some 25 per cent. of the amount spent on the boiler, instruments and draught plant which they serve, and a considerable improvement is expected from the unit-fired boilers being installed at Congella, Durban. The precipitators require d.c. at up to 80 000 V, and probably more space than the other types, but they are highly efficient. If the percentage of ash in the coal used at Congella were reduced at the pit mouth from the present 15 or 16 to 5 or 6 per cent., the number of railway trucks saved for haulage purposes per annum would be about 500, and the railage saved £12 000.

COVENTRY ELECTRIC CLUB

The monthly meeting of the Coventry Electric Club was held at the electricity showrooms on April 10 when Mr. A. M. Craig read a paper on "Automatic Control Devices." Mr. F. Godden, the city electrical engineer and manager, presided.

The paper reviewed the application of automatic controls in machine tools as viewed by the machine tool maker, the maintenance engineer and the control gear manufacturers. The responsibility of the machine maker in providing sufficient space and proper wiring accommodation, and in submitting full technical information was stressed.

An interesting point was raised during the discussion, when it was generally agreed that no suitable protection had been put on the market on an economical basis for use with fractional h.p. motors which passed current of less than half an ampere to guard against burn-out, upon the development of a fault in such a motor.

Town and Country Planning

How the Order Affects Electricity Undertakers

IN a letter issued by the Electricity Commissioners the attention of all electricity undertakers in England and Wales is drawn to the Town and Country Planning (General Interim Development Order, 1945), which was made on March 27, and comes into force on May 1; and to the explanatory memorandum issued by the Ministry of Town and Country Planning.

In effect the Order will apply to all land in England and Wales which is subject to a planning resolution, i.e., in respect of which an approved planning scheme is not already in operation. The point with which electricity undertakers will be particularly concerned is what development proposed to be undertaken for the purposes of their electricity undertaking is (a) "permitted development" (i.e., development which can be carried out without first obtaining interim development permission) for the purposes of the Order; (b) development in respect of which interim development permission must be obtained.

Overhead Lines

Although electricity undertakers may be carrying out development under Classes I, III or IV, they will be more particularly concerned with Class II which relates to development sanctioned before the commencement of the Order by any Government department, including the Electricity Commissioners, and Class V which relates to certain types of permitted development by electricity and other undertakers as specified in paragraph 4 of Part I of the Schedule. While it will not normally be necessary for electricity undertakers proposing to apply for the consent of the Minister of Fuel and Power to erect overhead lines in any area to which the Order relates to make any separate application for interim development consent, the Minister of Fuel and Power has agreed that he will, before giving his consent under the Electricity (Supply) Acts, refer to the Ministry of Town and Country Planning certain types of cases, including: (a) any case in which the Minister of Fuel and Power receives an objection from a local authority on amenity grounds; (b) any proposal which involves the use of certain specified types of structure which might conflict with amenity; (c) other types of application which present special features.

So far as new construction is concerned, the main types of development in respect of which it will still be necessary for electricity undertakers to apply for interim development permission will be any new buildings or extensions of existing build-

ings and such structures and erections as are not covered by paragraph 4 of Part I of the Schedule, e.g., chimneys, external coal conveyors or cooling towers not coming within the category of sub-paragraphs 3 or 4 of paragraph 4, or sub-stations, feeder pillars or transformer kiosks of stone, concrete or brickwork.

It should also be noted that in certain cases and subject to certain qualifications, the automatic permission may be excluded either as respects a particular area, or in any particular case. Where such a direction becomes operative under Article 5, permitted development under Class V of Article 4 will be limited to that specified in Part II of the Schedule to the Order.

With regard to the procedure to be followed in respect of those limited classes of development for which electricity undertakers are required to obtain interim development permission under the Order, the normal procedure is set out in Articles 10 and 11 (1) of the Order, but special procedure is provided in Article 11 (2) of the Order for certain types of application by statutory undertakers. In this connection the Commissioners draw the special attention of electricity undertakers to the comments on Article 11 in the explanatory memorandum.

Sites and Buildings

It is hoped that in a substantial proportion of cases the undertakers will, as a result of contact so established, feel able to avail themselves of the normal procedure contemplated in Articles 10 or 11 (1) of the Order and will not find it necessary to proceed under Article 11 (2) of the Order. Where, however, undertakers avail themselves of Article 11 (2), while the service of an appropriate notice will itself constitute an application for interim development permission, it will be necessary for the notice to be accompanied by sufficient material to enable the Ministry to reach a decision.

It is important that when electricity undertakers make application to an interim development authority in the first instance, they should make it clear whether such application is intended to be made under Article 10 or Article 11 (1) or (2).

In the case of development proposed to be carried out by electricity undertakers in an area for which they are themselves the interim development authority, or the responsible authority under a planning scheme, the provisions of Section 32 of the Planning Act, 1944, will apply.

E.A.W. Annual Conference

Presentation of Report—Address by Lord Brabazon

THE annual general meeting of the Electrical Association for Women was held on April 19, at the I.E.E. when a large and representative gathering of members from all parts of the country attended. The Dowager Lady Swaythling was in the chair.

Miss C. Haslett, the Director, gave a résumé of the annual report in which she said the year 1944 saw a development of that spirit of optimistic determination so clearly evident during 1943; the war was still to be won, but the end was within sight, and the minds of all were turned longingly and confidently to that end. This optimism and determination expressed themselves throughout the E.A.W. in the maintenance of all war-time efforts still required. The publication in 1943 of the interim report was regarded as a milestone in the association's planning, and a final report was now in course of preparation. The planning impetus had been accelerated by the displays of new housing and new kitchens.

Work of the Branches

A notable feature of branch work had been the increasing attention again given to matters electrical. Branches had had many talks on the care and maintenance of electrical equipment, and had been glad to provide such talks and demonstrations to a wider public. The passing of the Education Act coincided with many talks on education generally, given to branches. One of these dealt with electrical education in secondary schools, and concern had been expressed that girls were excluded from some careers by lack of training facilities in physics, chemistry and mathematics. The setting up of a Royal Commission on Population was reflected in talks on "A Positive Population Policy and Population Trends," for the E.A.W. believed that an all-electric home was a substantial contributing factor to the achievement of keeping a home and caring for children without domestic help.

One new branch was formed during the year, the South-West Essex branch, with headquarters at the South-West Essex Technical College.

The Home Workers' syllabus had proved extremely useful and adaptable. The results of examinations held during the year showed that in all, 284 certificates were gained, 82 with credit, and five with distinction, and 1 116 since the scheme was inaugurated. In the examinations for the Electrical Housecraft Certificate, 25 certificates (three with distinctions) were awarded to demonstrators, and 93 (11 with distinctions) to teachers. Over 100 demonstrators

attended the conference for senior demonstrators arranged jointly by the E.D.A. and the E.A.W. in December, 1944. Last year a short section of the annual report was devoted to Scottish affairs, and although they were incorporated in the general account of work done, it should be noted that electrical development now going on was accomplished by much planning on the part of the E.A.W. Scottish Council, of which the secretary and treasurer is Mrs. Falconer. The work of the Women's Advisory Housing Council was developing, and in every new branch the E.A.W. was asked to participate. The E.A.W. was represented on many committees associated with electrical development.

As a result of her many contacts with the three Services the Director became aware of the desire on the part of Service women for information regarding post-war careers and prospects. She therefore convened at headquarters a conference of representatives of the Services and of the electrical industry. The subject had been further considered at many informal conferences since, and it was hoped to secure for Service women, openings that would provide useful employment and to secure for the electrical industry many of the trained personnel who had already contributed so much to the community.

The latest additions to the association's aids to electrical education were the two charts in the How it Works series—the Electric Refrigerator and the Electric Refrigerator Mechanical Unit. There had also been new leaflets illustrating these charts and they had been widely circulated. The success of the Cheerful Rationing cards had continued. During the year the Director broadcast to India in the series "Pioneers of Progress", to the West Indies on "Women in Engineering," and in the Pacific Service in the "As I See It" series.

American Mission

The Director undertook another war-time mission to America, and she was able to give to American women a first-hand account of how British women were dealing with their war-time problems. Before the year ended the Director had accepted an invitation from the British Council to pay an official visit to Sweden.

In concluding, Miss Haslett said it was hoped to stage an exhibition at Dorland Hall about the middle of October, as part of the E.A.W. 21st birthday celebrations, in which would be portrayed developments in electricity during the 21 years the E.A.W. had been in existence, especially as it

affected the objects for which they stood; to show something of the amazing work that women had done from an electrical standpoint, during the war; and finally it was hoped to give a glimpse into the future of what electricity might be hoped to do for the woman in the home, and for the community generally. It was also hoped to have a book which Mr. Wilfrid Randell was preparing on the life story of the E.A.W. ready for the anniversary.

In presenting the accounts, the hon. treasurer, Mrs. F. E. Jones, said that in spite of increased expenses, they still had a small balance on the right side.

During the meeting it was announced that the following officers had been elected: President, The Dowager Lady Swaythling; vice-president, Lady Hurcomb; chairman, Mrs. F. N. Rendell-Baker; vice-chairman, Mrs. A. B. Lewis; hon. treasurer, Ald. Mrs. Gregory. Other members elected to the Executive Committee were Mrs. C. Deave, Mrs. H. L. Dover, Mrs. M. B. Jackson, Miss E. M. Parker, and Mrs. W. Scott. Lady Railing and Miss E. Denby, the architect, were elected to the Advisory Council.

Women's Work in Electrical Field

Lord Brabazon then addressed the members on the subject of electricity, commencing with its birth in the laboratory, and describing some of the discoveries of Prof. Crookes, J. J. Thomson, Faraday and Clerk-Maxwell, among others.

He could not pretend, he said, that we had not still a lot to do. Amongst other things our voltages were not yet standardised. On the question of prices Mr. Dale, of the E.D.A., had stated that apart from the quarterly charge, which, of course, might vary, no less than 83 per cent. of the consumers whose houses were connected for current were charged less than 3d. per unit; 14.8 per cent. were charged a price between 3d. and 1d. per unit; and only 1.7 per cent. were charged more than 1d. per unit.

During the war he thought women had shown themselves more adept in engineering and in connection with electricity than they ever thought possible before. Women who were formerly dress-makers had been running electrical repairs, winding armatures and doing many other skilled jobs; they had been repairing delicate scientific electrical instruments. They had also been engaged in aircraft work. The work of women in the electrical side of the ship-building industry had been remarkable. The way in which women had seized on to all the intricacies of Radar, which was a very advanced electrical field, their work as official repairers and maintenance staff, showed that there were no mysteries in electricity in which women could not in-

dulge. He, therefore, hoped that, having shown the world what they could do, women would not retire from the prominence into which they had come, but that they would assert themselves in the future.

In the past, the impression had been that cooking could be done only by the application of heat; but that was not so. We could bombard food by short rays and cook it in the cold.

On the whole the development of electric reaction had been very slow. We had not even yet electric cars with interchangeable batteries.

In the laboratory we had new thoughts, as, for instance, on the generation of electricity from atomic energy. If it eventuated, it would certainly give us electricity at much lower cost than at present. There was also, of course, the possibility of controlling atomic energy as a prime mover. That was not near; but it would be the solution of the coal problem for our children's children. Not enough work had been done on bio-chemistry in relation to electricity. There were discoveries to be made on the reaction of the molecules in human beings. On the question of the application of electricity to the soil he was perfectly certain that a lot had to be done along that line. In the therapeutic sphere there was the use of electrical appliances for the eradication of fatigue.

Electricity in Cheshire

A QUESTIONNAIRE submitted by the Technical Committee of the Cheshire County Branch of the National Farmers' Union to representatives of branches in that county revealed that the supply of electricity was inadequate in thirteen areas and adequate in three. At one place the landowner refused to allow lines to be carried over his estate. Two branches stated that the installation charges were reasonable and others complained that they were excessive, while some gave figures without expressing any opinion. The charge for current varied from one area to another, and the general opinion was that in the main it was high. For power use the system offered was mostly three-phase and partly single-phase. The percentage supplied with electricity in the branch areas were as follows: Wirral 50 per cent.; Middlewich, 40 per cent.; Northwich, 80 per cent.; Crewe and Sandbach, one sixth; Nantwich, 10 per cent.; Audlem, 35 per cent.; Hyde, 85 per cent.; Malpas, 15 per cent.; Winsford, 60 per cent.; Chester, 90 per cent.; Holmes Chapel, 25 per cent.; Wrenbury, 5 per cent.; Congleton, 25 per cent.; Frodsham, 70 per cent. All branches reported satisfactory service.

Electrical Measurement of Moisture

Industrial Applications of a New Type of Meter

THE I.E.E. Measurements Section on April 20 discussed a paper on "An Electrical Moisture Meter" by Dr. L. Hartshorn and Mr. W. Wilson.

After giving an outline of the purpose which moisture meters are intended to serve, and of the various types which have previously been considered, the paper described the development and construction of a new type of meter that had already been put to good use in several industries.

A constant alternating voltage is applied to a sample of the material contained in a small vessel, which may be regarded as a fixed air condenser, or in some instances as a conductivity cell. The current passing through the material is measured by means of a sensitive thermionic ammeter of special construction, which can be adjusted to read the capacitance current, proportional to the dielectric constant of the material; the conductance current, proportional to its a.c. conductivity; or some function of both these currents. The current selected is that which shows the most favourable variation with moisture content.

The use of the meter for testing seeds and grain, dried foods and flax straw was discussed, and typical results were given. Other applications were briefly outlined.

Mr. W. E. Doran (Cambridge Instrument Co., Ltd.) said his company had been troubled with the problem of producing a reliable moisture meter for many years and made its first instrument in 1923. Many difficulties had been encountered, and they were now making one on very similar lines to that described in the paper. However, they came to the decision that pure capacity and pure resistance was not sufficient and an impedance bridge was made use of. The supply to the circuit was by means of a radio frequency oscillator driven by batteries. This worked well and had proved very satisfactory, particularly with maize and tobacco, and it had also been used with malt, flax seed, butter and tea. There was a great demand for this instrument, and, although in many cases a high degree of accuracy was asked for, that was not essential and, indeed, it was difficult to get. In every case, however, they standardised against the oven drying process, but even so they did not always get close agreement in the case of tobacco, because not only was there the water in the tobacco, but other things came in, such as essences, which upset the measurement. Therefore, it was necessary to compromise and hope that an accuracy within $\frac{1}{2}$ per

cent. would be good enough. Experience had shown that this was sufficient. Experiments had also been carried out on wood with a special type of instrument, but that was only useful for comparative purposes and was not really reliable. There was no doubt of the demand for an instrument to measure moisture to a high degree of accuracy.

Mr. Ashley Jones (J. Bibby and Son, and a member of the Society of Chemical Industry) spoke from the analytical point of view and said the need for a moisture meter in his case was that not only was it necessary to measure hundreds of samples of cattle food in its original state, but also a large number of commodities which went into the cattle food as compounded. He gave figures of results obtained with moisture meters on different materials and spoke of discrepancies which had arisen as between the meter and the oven readings, and asked for assistance in explaining them.

Mr. S. Brightwell (Low Temperature Research Station) referred to the application of moisture meters to vegetables, and said the authors' instrument had been found to work very satisfactorily. It was being operated by relatively unskilled people under factory conditions and an accuracy of ± 0.5 per cent. could be relied upon. A very high percentage of results were within ± 0.2 per cent.

Mr. A. W. Russell (Philips Industrial) agreed with the authors that simplicity of operation was of the greatest importance, and said that due attention to this point would do much to ensure the success of the new electronic measuring instruments. Expressing his admiration of the ingenious arrangement of using a phase-selective meter to measure either the conductance or capacitance current, or some combination of both, he asked how the phase setting of the instruments was determined during manufacture to ensure that all instruments for a given job would have the same calibration. The authors' suggestion that the moisture value as measured electrically was of greater use from the practical standpoint than that measured by the oven method merited careful consideration from the milling fraternity. Mentioning that he also had been concerned with the development of a moisture meter, he said that for various reasons it was decided to base the design of the instrument upon the measurement of the capacity of the test condenser at a high frequency. A capacity bridge method was tried first, but

was discarded because it was found that any change of the residual capacities changed the shape of the calibration curve. In the final instrument, the test condenser formed part of a tuned circuit together with a parallel variable capacity for zero adjustment. The tuned circuit was energised by a 1 Mc/s oscillator and the voltage across the tuned circuit was rectified by an infinite impedance detector with a 0.1 milliammeter in its anode circuit. The circuit was tuned to a frequency slightly higher than that of the oscillator so that the increase of capacity in the test condenser brought the circuit more nearly into resonance with the oscillator. One advantage of this circuit was that the meter reading, and hence the sensitivity, was proportional to change of capacity and not directly to capacity, so that the moisture content of materials of higher dielectric constant could be measured with the same degree of sensitivity as materials of lower dielectric constant. So far experience with this instrument had been confined mainly to grain, but experiments with other materials indicated that it would have a wide field of application.

Mr. R. F. S. Hearman (Forest Products Research Association) said that whilst the application of moisture meters to timbers had given satisfactory results, there were certain limitations which must clearly be kept in mind, otherwise the results were likely to be misleading. There was the question of whether the electrical recording of moisture in timber related only to the moisture in the surface cells or whether it related to the moisture throughout the whole of the timber. He had carried out experiments with resistance type and capacity type moisture meters and had found that if there was a moisture gradient in the timber, the capacity type meter was probably less effective than the resistance type.

Mr. P. M. Bennett asked if the authors could give any indication of the behaviour of the instrument in relation to the pH value of the moisture, and also its behaviour in relation to the temperature coefficient of the moisture.

Mr. C. F. Brockelsby (Marconi Co.) said he and his colleagues had been working on a practically identical problem for some time and it was remarkable and satisfying to find how the work of the authors had confirmed his own work. The instrument now being made by his company was based on the same conclusions as those of the authors.

Mr. W. Schiek suggested that users of this type of instrument, when they desired to go into the refinements of moisture distribution in any substance, the amount of moisture and, perhaps, the chemical

changes caused by water, should revert to some such method as the two ammeter method by which it was possible to check for capacitance and power factor, and try to derive from the information so obtained some data which could be interpreted in everyday language.

Mr. F. E. J. Ockenden said the instrument had the merit of simplicity and apparently had filled a long felt want inasmuch as it had a good many satisfied users.

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.

Old Memories

[TO THE EDITOR]

Sir,—Now that things are going so well with our Forces on the Western Front in Germany—with the River Weser crossed in several places and Bremen being approached—I send



Cable-laying on the River Weser 38 years ago

you a photograph of cable-laying work in which I took part in 1907—38 years ago—in the Free State of Bremen. The district, as you know, is one of the old Hanseatic cities. A gang of men was taken from Birmingham and they laid the first submarine 10 000-V e.h.t. electric power main to the new power station, a few miles from the city on the River Weser for the supply of power and light to Bremen.

The writer is seen on the dredger with the engineer-in-charge of all construction on the Weser River for the Free State, both standing under the flying flag. The dredger made a trench in the sand bottom two metres deep.

We had a steam launch provided by the Free State and when we went on the job the authorities always hoisted the Free State flag.

Yours faithfully,
Birmingham. **GEO. BARNARD.**

News in Brief

Birmingham Electric Club.—A luncheon reunion is to be held at the Grand Hotel on May 26, at 12.30 for 1 p.m.

Sanatorium Installation.—The Bedford Electricity Committee is to provide supply to a sanatorium at the request and cost of the Bedfordshire C.C.

Rate Relief Contribution.—According to the annual financial statement the Bolton Electricity Committee is contributing £10 000 towards relief of rates.

New Telegraph Service.—Cable and Wireless, Ltd., announce that the telegraph service, for commercial and social telegrams, has now been restored between Great Britain, and Manila (Philippines) and Guam.

Library Appeal.—The Wessex Electricity Company's showrooms at Newbury have been loaned as a receiving depot for children's books during an appeal made by the local public library.

Progress in the Clyde Valley.—The Clyde Valley Regional Planning Advisory Committee reports progress which includes tentative conclusions on the electrification of certain railway lines.

Electrical Exhibitions.—The Wessex Electricity Co. are staging a post-war kitchen exhibition at their showrooms at 39, Northbrook Street, Newbury. The Blackburn Electricity Committee is spending £350 on the "Electricity Looks Forward" exhibition, to be held in August.

Ray-therapeutics in Britain.—Speaking at the Institute of Ray-Therapy Hospital for electro-physical treatment, recently, Lord Horder said that Britain had been slow to recognise physical medicine. Russia was very much in the van of exploiting the branches of sun-ray treatment but we were coming along at last.

Institute of Physics.—A meeting of the South Wales Branch of the Institute of Physics will be held on May 12, at 2.30 p.m. in the Physics Department of the University College, Cathays Park, Cardiff, when Prof. W. V. Mayneord, will lecture on "The Use of Infra-red Radiation in Medicine." Communications concerning this lecture should be addressed to the Honorary Secretary, Dr. T. V. I. Starkey, Technical College, Mount Pleasant, Swansea.

Improved Electric Vans.—Improvements in the range and performance of battery-

driven electric vehicles, usually used as tradesmen's delivery vans, are stated to have been accompanied by a reduction in cost. The range per charge has been doubled, the speed increased by about 33 per cent., and the cost cut by almost one-third.

Mill-lighting Exhibition.—The Oldham Electricity Committee is arranging an exhibition of up-to-date mill lighting to be held in the near future in the electricity showrooms.

Electricity in Mines.

—The Ministry of Fuel and Power has issued a list of electrical apparatus for which certificates of flameproof enclosures have been granted during the three months ended March

31, 1945. 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), and may be obtained from The Library, Ministry of Fuel and Power, King's Buildings, Dean Stanley Street, S.W.1.

Students' Continuation Scheme.—The Liverpool Electric Power and Lighting Committee has approved the continuation of a scheme for the training of university students. At the April meeting of the City Council, questions were asked as to the position of apprentices who had been called to the Forces, and what steps would be taken to ensure that they would receive adequate training on their return to civilian life. The Chairman of the Committee stated those now serving as electricians in the Forces would be given special consideration.

Bolton Resolution.—Following the controversy at Bolton, concerning grants to the Electrical Engineer and other officials, comes the intimation from the General Purposes Committee that this resolution has been tabled for the annual meeting of the Association of Municipal Corporations in London, on May 24: "That in connection with extensions to electricity generating stations owned by local authorities this Association strongly disapproves of the policy of the Central Electricity Board, which compels generating station owners either to engage consultants involving considerable expense, or to pay large fees by way of grants for professional services to officials in the employ of a local authority."

TWENTY-FIVE YEARS AGO

FROM THE ELECTRICIAN of April 23, 1920: It is stated that the preliminary estimates for the bridge and dam across the River Severn near Chepstow, by means of which it is proposed to utilise the 40-ft. tide in generating electric power, put the cost at between £6 000 000 and £8 000 000.

Electricity Supply

Guildford.—The Electricity Committee is seeking sanction to borrow £4 230 for electricity supply to the Stoke Hill estate and £8 804 to the Park Barn estate.

Portland.—The Electricity Committee has asked the Electrical Engineer and the Treasurer to report on the question of the hire-purchase of electrical apparatus.

Middlesbrough.—The Borough Electrical Engineer has been authorised to discuss the question of a bulk supply of electricity with the North-Eastern Electric Supply Co., Ltd.

Leeds.—Despite a protest by the local Federation of British Industries, the Electricity Committee has adhered to its decision to increase the tariff for power consumers by 5 per cent. and to suspend the 5 per cent. discount.

Douglas (I.O.M.).—The Electricity Committee has declined to accede to a request from the Boarding-house and Apartment Association for the removal of the 10 per cent. surcharge on rentals of meters and cookers installed before the outbreak of war.

Billingham-on-Tees.—Revised charges drawn up by the North-Eastern Electric Supply Co. Ltd. have been accepted by the U.C. for modified street lighting. The Council has stipulated that when full lighting is resumed, the charges agreement of August, 1936, shall operate.

Tynemouth.—The T.C. has fixed the following rate for electricity supplied for industrial purposes:—85s. per kW of m.d. per annum plus .5d. per unit, subject to the addition or reduction at the rate of .01d. per unit supplied for each 1s. by which the price of coal for the calendar year is above or below 12s. a ton.

Cardiff.—A feeder from Heath Estate to Fair oak kiosk is to be provided, at a cost of £2 550; an additional switch at Heath Estate at £520; a feeder from Gabalfra sub-station to St. Michaels Road sub-station at £2 610; and feeder from Gt. Western Lane sub-station to Gripoly Mills is to be increased, at £1 880.

Carlisle.—At a meeting of the City Council it was reported that the first extensions to the Willows Holme generating station had cost £501 036 for buildings and £670 474 for machinery. The previous loans sanctioned amounted to £1 075 000. and it was decided to apply for sanction to borrow the balance of expenditure amounting to £96 511. It was reported that the second scheme for extensions was well in hand.

Southampton.—In the report published recently by the electricity department the Electrical Engineer, Mr. W. G. Turner,

states that the growth in the sales of electricity has resulted in the most successful year's working since the commencement of the war. It is calculated that the total income from all sources for the year ending March 31, 1945, is £668 290, an increase of £88 475 over the figure for the preceding year. The total working expenses, including a provisional sum of £437 420 for the purchase of electricity from the Central Electricity Board, is estimated at £554 620, £71 745 more than for the preceding year. The gross profit is estimated at £113 670. The estimated surplus amounts to £27 410, as compared with an estimated deficiency of £13 010 when the estimates were prepared a year ago, and a net surplus of £6 905 for the preceding year. For the coming financial year it is estimated that the total income will be £703 280, and the working expenses, including the purchase of electricity from the Board, £586 140, leaving a gross profit of £117 140. Of the last-named sum, it is estimated that £79 100 will be required for distribution interest and redemption charges, £10 000 for income tax, and £15 000 is earmarked for special expenditure. Independently of the above accounts, the expenditure for generation of electricity on behalf of and payable by the Central Electricity Board is now estimated at £451 670 for the year ending March 31, 1945, and £423 890 for the coming financial year.

In Parliament

Hydro-electric Schemes.—Replying to Capt. W. T. Shaw, Mr. Johnston said that terms arranged with the Dumbartonshire County Council in connection with the Loch Sloy Hydro-Electric Scheme were still under discussion. There would, he said, be no change whatever in the constructional scheme.

Electricity, Telephone and Radio Services.—In reply to Sir I. Fraser who asked the Postmaster-General if, in co-operation with electricity undertakings, the telephone service and radio manufacturers, he would organise research to ensure that electricity, telephone and a number of radio programmes could be taken to villages and remote farms on the same poles or even the same wires, so as to reduce the cost of these services and make them universally available. Capt. Cruikshank said use was already made of the same poles for electricity and telephone wires to a limited extent, and it had been arranged to examine the possibility of extending this practice.

Industrial Information

Ekco Publicity Scheme.—Prominent solus sites are being used in the Ekco lamps publicity scheme in London and the provinces. The illustration shows a typical display poster.

Aluminium Exhibition.—The Aluminium Development Association is sponsoring an aluminium exhibition which opens at Selfridges on May 30. Something will be shown of how the industry has met the demands of war, but the main purpose of the exhibition is to show what aluminium can do in peace-time.

" Making Work Lighter."—Under this title, the sixth of the series of lighting reconstruction pamphlets issued by the Illuminating Engineering Society, has for its subject the lighting of factories. Emphasis is given to the main points with illustrations by Fougasse. It is intended for the guidance of those concerned with industrial lighting, and the price is 6d.

Fuel Efficiency News.—The publication of the Ministry of Fuel and Power (Fuel Efficiency Committee) for April emphasises the need for continued economy in the use of gas and electricity. The saving of power and light is the subject of this month's poster.

Ballylumford Power Station.—The makers of the variable speed a.c. motors at the Ballylumford power station, described in our issue of April 13, were Laurence Scott and Electromotors, Ltd., and the makers of the 3.3 kV two-speed motors were Lancashire Dynamo and Crypto, Ltd.

British Industry and Commerce.—A select bibliography dealing comprehensively with the history and reconstruction of British industry has been published by the Sheffield City Libraries, price 6d. post free. It forms a reliable guide to the study of this important subject. All the publications listed in the bibliography are available in the Sheffield city libraries.

Callender Publications.—Publication No. 143, issued by Callender's Cable and Construction Co., Ltd., this month, gives details of their 132 V three-core impregnated pressure cable, which is claimed to represent the most economical method of underground electrical transmission at 132 kV. Publication No. 139 deals with the company's pressed steel mining type straight

joint box suitable for compound, bitumen, or lead sheathed and wire armoured cables.



One of the new Ekco display posters

B.E.A.M.A. Contract Price Adjustment Formulæ.—For purposes of calculating variations in (a) rates of pay, the rate of pay for adult male labour at April 14, shall be deemed to be 90s. 6d.; (b) costs of material, the index figure for intermediate products last published by the Board of Trade on April 14, is 179.6 and is the figure for the month of March, 1945.

A.E.I. News.—This month's issue contains an article dealing with the output of electricity in the United Kingdom, accompanied by a chart covering the period from 1900 to the end of 1943 and showing that the output tends to double itself every seven years. The war years proved no exception to this rule. The rest of the contents is devoted to social, recreational and personal affairs of the employees of the A.E.I. companies.

Insulating Materials.—The dielectric qualities and various applications of the mica and Micanite products of H. Clarke and Co. (Manchester) Ltd., are fully described and illustrated in an excellently produced booklet, No. M/44, published by the company. Another equally attractive booklet, No. P/44, deals with the manifold uses of Pirtoid, a Bakelite laminated material, manufactured by the company, with high dielectric and mechanical strength combined with lightness and ease of machining, resistance to moisture and heat and inertness to chemicals.

Standards Review.—The current number of the quarterly publication of the British Standards Institution contains a message from Lord Woolton, Minister of Recon-

struction, who is this year's president, and a number of articles dealing with the science of better buying, standardisation of colour, automobiles, and the electric fence, standards for copper and copper alloys, zinc, building, and concrete railway sleepers, British standard concert pitch, screw thread unification, the basis of standardisation of measurements, and boiler water treatment.

Hand-forming of Light Alloys.—Bulletin No. 9, Spinning and Panel Beating of Aluminium Alloys, issued by the Wrought Light Alloys Development Association, begins with a general survey of the forming properties of the aluminium alloys in which the phenomena of work-hardening, softening, and grain growth are discussed as far as possible in non-technical language. The heat-treatable alloys and the effects of heat treatment, are similarly dealt with. The crafts of spinning and

panel beating are described in some detail as are also the tools used. The booklet is profusely illustrated.

Fine Wires Exhibition.—The part played by the employees of Fine Wires, Ltd., in furthering the war effort was demonstrated at an exhibition which was opened at Nottingham recently by Sir Stafford Cripps, who said that he had been most interested in the firm's processes, particularly the covering of fine wires because, both as Minister of Aircraft Production and chairman of the Electrical Board, he had been closely concerned with the vitally important electrical devices which depended for their construction upon large quantities of high quality insulated wire. The purpose of the exhibition being to show to the employees of the firm how their work had helped, practical demonstrations by R.A.F. and Army personnel formed a principal feature.

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.

Liverpool Electricity Department, April 27.—Supply of h.t. and l.t. switchgear for sub-stations. Particulars from the City Electrical Engineer, 24, Hatton Garden, Liverpool, 3.

Manchester Electricity Department, April 30.—Extensions to 33 000 V switchgear at the Barton generating station and Benchill sub-station (Spec. No. B.145). Particulars from Mr. R. A. S. Thwaites, Electricity Department, Town Hall, Manchester; deposit, £1 1s.

Batley T.C., April 30.—Supply and delivery of p.i. lead sheathed steel tape armoured cables. Particulars from the Borough Electrical Engineer, Electricity Works, George Street, Batley.

Glasgow City Council, April 30.—Supply and erection of three electrically-driven centrifugal pumps, one exhauster for priming same and one portable electrically-driven centrifugal pump. Specification from the Manager, Sewage Department, 50, John Street, Glasgow, C.1.

Grimsby Electricity Department, May 1.—Supply of two e.h.p. switchgear (Spec. 425), two l.p. switchgear (Spec. 428), three transformers (Spec. 429) and 5 000 yds. e.h.p. and l.p. cable (Spec. 430), for sub-stations. Specifications from Mr. G. W.

Parker, Electricity Works, Moss Road, Grimsby.

Manchester Public Health Committee, May 2.—Supply of light, mobile X-ray apparatus required for the Withington Hospital, Nell Lane, West Didsbury, Manchester, 20 (a.c., 230 V). Particulars from the Medical Superintendent at the hospital.

Formby U.D.C., May 3.—Supply and delivery of 1 400 kVA outdoor type transformer. Specification from Mr. D. L. Leonard, Council Offices, Formby.

Plymouth City Council, May 5.—Supply and delivery of l.t. underground network disconnecting boxes. Specification from the City Electrical Engineer, Armada Street, Plymouth.

Bury Electricity Department, May 7.—Supply and delivery, for 12 months, of (a) meters, (b) p.i. cables. Particulars from the Engineer and Manager, Electricity Department, Market Street, Bury.

Louth Electricity Department, May 11.—Supply of (a) e.h.p. cables, (b) l.p. cables, (c) e.h.p. truck type switchgear and (d) transformers. Particulars from the Borough Electrical Engineer, Electricity Department, Cannon Street, Louth.

South African Electrical Convention.—The Association of Municipal Electricity Undertakings of South Africa and Rhodesia, which is shortly holding a convention in Salisbury, Southern Rhodesia, is to include an inspection of the Cable and Wireless Ltd. wireless station in its programme of visits of technical interest.

Company News

WOKING ELECTRIC SUPPLY CO., LTD.—Fin. div. on ord. 4½%, tax free, (same).

HERBERT MORRIS LTD.—Intm. on ord. 5%, tax free (same).

HEATRAME LTD.—Fst. and fin. 12½% on ord. (same). Net pft. to Feb. 28, £15 192 (£11 312).

URBAN ELECTRIC SUPPLY.—Net pft. 1944 £19 612 (£16 233), brot. in £54 505, fin. div. 4%, mkg. 8% (same), fwd. £57 517.

ATLAS ELECTRIC AND GENERAL TRUST.—Fin. div. 3½% on 7% cum. pref., mkg. 7%, payable June 1 to holders reg. May 1.

B.C. AND H. POWER STATION CO. LTD.—Receipts for 1944 £199 267. To fees £1 030, deb. int. £96 576, deb. redemptn. £101 661.

EVER READY TRUST.—Fin. on ord. and defd. 7% (same), mkg. 10% in each case (same). Revenue to Mar. 31, £31 834 (£31 762).

SANGAMO WESTON.—Fst. and fin. 15% (same), payable May 10. Pft. 1944 £28 379, after taxn. £31 944 (pft. £30 560, taxn. £54 121).

MOUNTAIN STATES TELEPHONE AND TELEGRAPH.—Total oper. rev. 1944 \$43 326 603 (\$40 061 197), net inc. \$3 353 697 (\$3 382 974).

INTERNATIONAL TELEPHONE AND TELEGRAPH (U.S.).—Net income 1944 (excl. of certain important subsids.) \$7 808 745 (\$5 664 396).

WEST DEVON ELECTRIC SUPPLY CO. LTD.—Fst. and fin. 5% (same). Net pft. 1944, inclgd. £2 500 divs. from subsids. (nil), £30 512 (£26 036).

ORIENTAL TELEPHONE AND ELECTRIC CO. LTD.—Net rev. 1944 £20 482 (£19 431). Brot. in £81 050. Ord. div. 4% £22 808 (same), fwd. £78 724.

SOUTH WALES ELECTRIC POWER CO.—Net pft. 1944 £192 325 (£168 413), brot. in £122 228, fin. div. 4%, mkg. 6% (5½%), fwd. £194 553.

WESSEX ELECTRICITY CO.—Net pft. 1944 £187 280 (£204 615), brot. in £77 507. Writtn. off disct. on deb. stk. £30 000, div. 3%, mkg. 5% (same), fwd. £84 787.

ISLE OF WIGHT ELECTRIC LIGHT AND POWER.—Pft. 1944 £58 334 (£51 067). Brot. in £7 057. Taxn. £19 000, fin. div. 5%, mkg. 8% (same), fwd. £11 891.

PRESSED STEEL CO. LTD.—Fin. div. on ord. 17½% less tax (same), mkg. 27½% (same). Net pft. provisionally announced as £195 000 (£180 000).

ELEKTROLUX (Stockholm).—Net pft. 1944 Kr.4 577 022 (after tax Kr.3 700 000 and pensions Kr.200 000). Div. Kr.7.50 per Kr.75 sh. (same), fwd. Kr. 17 903 601.

MANGANESE BRONZE AND BRASS CO., LTD.—Pft. 1944 £174 775 (£256 436). To de-

precn. £20 678 (£22 179), dirs.' rem. £2 936 (£3 852), leavg. £151 161 (£230 405). To taxn. £104 000 (£172 500), divs. £41 642 (same), fwd. £5 519 (£16 263).

A. REYROLLE AND CO., LTD.—To gen. res. £40 000 (same), devt. expend. £25 000, pref. div., fin. on ord. 7½%, mkg. 12½%, less tax (same), fst. and fin. on £189 330 new ord. 7½%, less tax (nil), fwd. £119 411 (£134 597).

LACRINOID PRODUCTS LTD.—Net tradg. pft. 1944 £53 855 (£57 058). To dirs.' fees £814 (£629), exes. £519 (£570), tax £47 000 (£50 300), leavg. net pft. £5 522 (£5 559). Div. 9% £4 500 (same), fwd. £2 633 (£1 611).

CABLE MERGER.—It is announced that British Insulated Cables Ltd. and Callender's Cable and Construction Co. Ltd. are to merge their main interests into a new co. which will have a total issued sh. cap. of £11 219 175, and will issue shs. as consideration for the undertakgs. acquired. It will also take over the trade investmts. of Callender's Trust. The issued sh. cap. of the new co. at its inception will be as follows:—933 334 6% first cum. pref. shs. of £1 each, fully paid; 1 045 455 5½% sec. cum. pref. shs. of £1 each, fully paid; and 9 240 386 ord. shs. of £1 each, fully paid.

Metal Prices

	Monday, April 23, Price.	Inc. Dec.
Copper—		
Best Selected (nom.) per ton	£80 10 0	—
Electro Wirebars	£62 0 0	—
H.C. Wires, basis ... per lb.	9½d.	—
Sheet	10¾d.	—
Phosphor Bronze—		
Wire(Telephone)basis ..	1s. 0½d.	—
Brass (60/40)—		
Rod, basis	—	—
Sheet "	—	—
Wire "	10¾d.	—
Iron and Steel—		
Pig Iron (B. 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	£26 10 0	—
Foreign or Colonial ..	£25 0 0	—
Tin—		
Ingot (minimum of 99.9% purity)	£303 10 0	—
Wire, basis... ..	3s. 10d.	—
Aluminium Ingots ... per ton	£85 0 0	—
Spelter... ..	£25 15 0	—
Mercury (spot) Warehouse	per bott. £89 15 0	—

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

Commercial Information

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.

PARTRIDGE TRANSFORMERS, LTD., London, S.W., elec. engrs.—Feb. 1, £4 000 deb.; general charge.

PROVINCIAL ELECTRICS AND REFRIGERATORS, LTD., Gosport.—Mar. 22, £10 000 deb.; general charge.

GARDNERS RADIO, LTD., Bournemouth.—Feb. 24, deb., to A. Gardner, Bournemouth, securing £2 000 (and further advances not ex. £2 000); general charge. *£2 500. Feb. 23, 1945.

PALACE ELECTRICAL CO., LTD., London, W.—Mar. 22, mort., to Midland Bank Ltd. securing all moneys due or to become due to the Bank; charged on moneys under contract.

SCHALL AND SON, LTD., London, W., elec. engrs.—Mar. 29, assignment and charge to Midland Bank Ltd. securing all moneys due or to become due to the Bank; charged on certain contracts. *£15 875. June 10, 1942.

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.

HANDS, Fred, 14, Rossall Avenue, Radstock Road, Stretford, electrician. £23 14s. Feb. 13.

BROTHERTON, R. and Son, 25, Albert Road, Colne, electricians. £21 17s. Feb. 17.

LEE, Geo., 42, Cranbury Road, Fulham, electrical engineer. £18 18s. 6d. Feb. 21.

MALDMENT, J., 17, High Street, Harrow-on-the-Hill, electrician. £31 4s. 3d. Feb. 23.

MIDDLETON, R., 21, Newport Court, Leicester Square, W.C.2, wireless dealer. £41 10s. 3d. Feb. 15.

HOCKEY, W., Allendale House, Wark, insulating engineer. £13 1s. Feb. 14.

Notice of Dividend

GILL, Herbert Jack, residing and carrying on business at 10, High Street, Keynsham, Somersetshire, electrical engineer and radio dealer. Supplemental dividend 1s. 9d. per £ payable April 27, 1945. Official Receiver's Office, 26, Baldwin Street, Bristol 1.

Notice to Creditors

CHIPPING NORTON ELECTRIC SUPPLY CO. LTD. (Members' Voluntary Winding-up.) The creditors of the above company are required, on or before May 25, 1945, to send their names and addresses and the particulars of their debts and claims to L. A. Pearl, 109, Jermyn Street, London, S.W.1, Liquidator.

Application for Discharge

WATKIN, Roy Heron, 3, Alexandra Road, Illogan, Cornwall (trading as Cornish Radio Exchange), carrying on business at 100, Trelowarren Street, Camborne, Cornwall, and lately carrying on business at Plain-an-Gwarry, Redruth, Cornwall, and at Commercial Road, Hayle, Cornwall, radio dealer. Date of hearing, June 8, 1945. 10.30 a.m., Town Hall, Truro.

Coming Events

Friday, April 27 (To-day).

I.E.E., N.E. STUDENTS' SECTION.—Newcastle-on-Tyne. Annual meeting. 6.30 p.m.—**SCOTTISH STUDENTS' SECTION.**—Edinburgh. "Oscillations in Mechanical and Electrical Systems." J. Willis. **GLASGOW.**—Joint meeting with the Students' Section of the Institution of Mechanical Engineers.

Saturday, April 28.

I.E.E., N. MIDLAND STUDENTS' SECTION.—Huddersfield. Problems Afternoon. 2.30 p.m.

Monday, April 30.

I.E.E., S. MID. CENTRE, RADIO GROUP.—"High Frequency Dielectric Materials," Prof. Willis Jackson. 6 p.m.

Tuesday, May 1.

I.E.E., LONDON STUDENTS' SECTION.—London. W.C.2. Discussion on the Reports, "Education and Training for Engineers" and "Part-Time Further Education." 7 p.m.—**N.W. STUDENTS' SECTION.**—Manchester. Problems Evening, preceded by the annual general meeting. 6.30 p.m.

COVENTRY ELECTRIC CLUB.—Electricity Showrooms. "Automatic On-load Tap Changing." G. A. P. Jewiss. 6.30 p.m.

Wednesday, May 2.

I.E.E., RADIO SECTION.—London, W.C.2. "Notes on the Stabilities of L. C. Oscillators," N. Lea. 5.30 p.m.

Thursday, May 3.

I.E.E., INSTALLATIONS SECTION.—London, W.C.2. "Excess-Current Protection by H.R.C. Fuses on Medium-Voltage Circuits," R. T. Lythall, and "Excess-Current Protection by Overcurrent Relays on Medium-Voltage Circuits," A. G. Shreeve and P. J. Shipton. 5.30 p.m.

Friday, May 4.

I.E.E., MEASUREMENTS SECTION.—London, W.C.2. "Meter and Instrument Jewels and Pivots," G. F. Shotter. 5.30 p.m.

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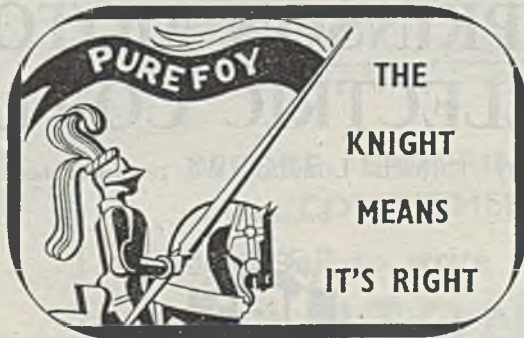
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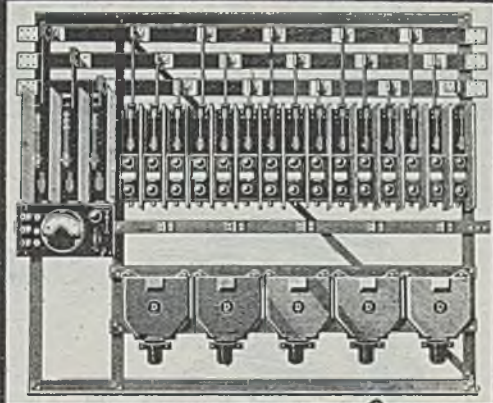
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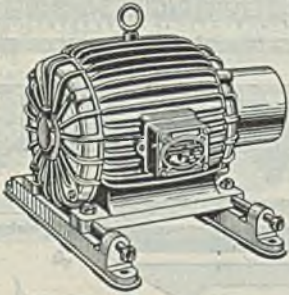
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