

of this equipment somewhat delayed the adoption of type-printing telegraphs in Great Britain, but the whole supplies of the telegraph system are now being manufactured at home. It is hoped that the establishment of the teleprinter exchange service which is being introduced by the Post Office as an adjunct to the public telephone switching system will produce a further extensive demand for these ingenious machines. Before the year 1912, when the telephone service of Great Britain was transferred to the Post Office, a large portion of the equipment was purchased from abroad. Now the proportion of foreign material purchased by the Post Office is less than one per cent of the whole. A great impetus was given to the mass production of apparatus on precision principles in 1922 by the general adoption of standardised types of automatic exchanges. This policy encouraged other nations to follow suit and export markets to several countries were opened up for automatic telephone equipment manufactured in Great Britain. The circuits and mechanisms developed for automatic exchanges opened up independent fields of application in other directions, such as the supervisory control of electrical power plant, centralised railway control and the electrical equipment of the totalisators now operating on race-courses. Telephone manufacturers were quick to take advantage of these applications.

#### Telephone Development

THE economic blizzard from which the world is now suffering has affected the rate of telephone development in Great Britain to a smaller extent than in any other of the principal nations. Sir Thomas Purves states that the net increase per annum in Great Britain in recent years has been about 125,000 stations. In the last complete year (1931-32) it fell to 84,000. Nevertheless, it is the largest increase recorded in any country of the world for the same period. For the whole of Europe, outside of Great Britain, the net increase was less than 200,000. In some countries the number of cessations of service exceeds the number of new subscribers and a net loss is registered. In North America, for example, the net loss is about 550,000 stations. For the current year, it is probable that there will be a net increase in Great Britain of about 80,000 and that many of the countries of Europe will show actual losses. In America there will be a large loss. If a revival of trade occurs, the telephone development of Great Britain will go forward by leaps and bounds. In the matter of underground, telegraph and telephone cables, Great Britain has been from the first a pioneer. For building open telegraph and telephone lines it is still necessary to depend on Norway and Sweden for slow-grown raw timber. English and Scottish mountain pine and Canadian and Australian timber have proved disappointing. The use of poles of metal and concrete has been investigated on numerous occasions, but so far the cost of these alternatives has proved prohibitive. The timber used for general construction purposes is obtained entirely from home and Empire

sources. The whole of the extensive radio plant and apparatus for long-distance communication used by the Post Office is of British manufacture.

#### Recent Developments in the Utilisation of Electricity

IN his inaugural address as chairman of the North-Western Centre of the Institution of Electrical Engineers, Mr. G. F. Sills discussed a very large number of recent developments in the utilisation of electricity. One of the most important and most promising of electric devices is the mercury arc rectifier. When supplied with direct current, it can be made to generate alternating current voltage at any frequency. It can also supply direct current when supplied with alternating current. It provides a link between a.c. and d.c. systems which works either way. Batteries can thus be used as a reserve on a.c. systems. One of the most important applications is to feed single-phase railways from a three-phase system at a different frequency. The standardisation of systems of supply for electric railways is thus not likely to lead to much trouble, as by the aid of the rectifier any kind of electric supply can be converted into any other. By its use it will soon be possible to transmit power by high-voltage direct current and this will lead to considerable economies in transmission. Obstruction lights are now being placed on power lines for marking obstacles along airways. They generally consist of neon tubes operated either at high or low voltages. They are used also to indicate high buildings and wireless masts. The light gives a large splash of red colour and is easily distinguished from other lights near the ground. Another interesting application is the reading of consumers' electric meters by means of telephone lines, the connexion being made through the power company's connexion with the telephone exchange. A device for indicating the presence of a dangerous amount of coal gas is also described. It works automatically, closing an alarm circuit, and it can be made to switch on an electric fan to clear the dangerous area.

#### Manufacture of Lenses

THE presidential address of Mr. W. Taylor to the Institution of Mechanical Engineers on October 28 was mainly devoted to the application of mechanical engineering to the production of lenses, particularly photographic lenses, which to-day are made by the tens of thousands. One of the characters of mechanical engineering, he said, is the extraordinary accuracy regularly attained in its best products. One thousandth of an inch is approximately the limit of accuracy which can be attained in the ordinary machining of metal with cutting tools, one ten thousandth the order of accuracy by grinding and lapping; but in making the best photographic lenses and other optical instruments of precision, the accuracy of the surfaces of the elements, such as lenses, prisms and mirrors, must be from one hundred thousandth to a few millionths of an inch, and this accuracy is attained in everyday working, not only by skilled artist craftsmen, but also by less skilled

persons doing repetition work by the aid of special appliances, the products of mechanical engineering. In the course of his address, Mr. Taylor referred at length to the functions and designing of lenses, the properties and the production of optical glass and the various workshop processes by which lenses are cut, ground, polished and tested. It was in connexion with work on photographic lenses that the need was felt for screw-threads much more accurate in form, more free from pitch and periodic error, and this in turn led to improved technique of screw-thread measurement, gauging and generation.

#### Andrew Laing Memorial Lecture

THE winter session of the North-East Coast Institution of Engineers and Shipbuilders was opened on October 21 by the delivery at Newcastle-upon-Tyne of the presidential address by Mr. R. J. Walker, who since 1899 has been associated with the Parsons Steam Turbine Co., Ltd., of which after the death of Sir Charles Parsons he became chairman and managing director. At the following meeting of the Institution, held on October 28, Engr. Vice-Admiral Sir R. W. Skelton, the Engineer-in-Chief of the Fleet, delivered the first Andrew Laing lecture. Laing, who was born in Edinburgh on January 31, 1856, and died in Newcastle on January 24, 1931, from 1877 until 1896 was connected with the Fairfield Shipbuilding and Engineering Co., Govan, and from 1896 until the time of his death was managing director of the Wallsend Slipway and Engineering Co. His life's work was mainly connected with the design and construction of the machinery of Atlantic liners, his most famous ship being the *Mauretania*, built in 1907, which for twenty-three years held the 'blue ribbon' of the Atlantic. The construction of this vessel and her ill-fated sister ship the *Lusitania* was due to circumstances somewhat akin to those existing to-day, when the fastest vessels in the mercantile marine are not registered as British vessels. The initial step was the formation of an Admiralty committee in 1902 which was directed to inquire into the principles on which subsidies were being given and to consider how and at what cost vessels could be secured which should combine great speed with a large radius of action. The outcome was an agreement between the Government and the Cunard Co. whereby the Government agreed to advance a sum of money at 2½ per cent interest for the construction of two ships and to increase the annual subsidy. The bold step of adopting steam turbines for the vessels was due to the report of a technical committee on which Laing served.

#### Memorial to Sir Gregory Foster, Bt.

A FUND has been raised for the establishment of a memorial to the late Sir Gregory Foster, at College Hall, London, a hall of residence for women students in the University with which he was connected for more than thirty years, during twenty-one of which he was chairman of the Council. The memorial has taken the form of the provision of teak doors throughout the public rooms of the new building

for the Hall recently erected in Malet Street and to be opened by H.M. the Queen on November 10. A memorial tablet designed by Mr. Brook Kitchin has also been placed in the entrance hall and bears a record of the services rendered by Sir Gregory Foster. A portrait painted by Mrs. Macleod has now been finished and has been hung in the council room of the Hall. It represents the sitter not as his friends knew him in the last years of his life, but as he will be remembered by those who knew him in the fullness of his strength and vigour, thus providing an interesting comparison with the portrait recently painted by Sir William Orpen which hangs in University College. The memorial tablet was unveiled on November 4 by Sir Alexander Gibb, who succeeded Sir Gregory Foster as chairman of the Council of College Hall. About a hundred or so of those who had subscribed to the memorial fund were present, and for the greater number of these the occasion presented the first opportunity of seeing the new building, which in itself is the greatest and most lasting memorial to Sir Gregory Foster's work in providing increased residential accommodation for the students of the University of London.

#### Huxley Memorial Medal and Lecture

THE presentation of the Huxley Memorial Medal of the Royal Anthropological Institute for 1932 to Prof. C. G. Seligman will take place on November 29, when Prof. Seligman is to deliver the Huxley Memorial Lecture at 8.30 p.m. Prof. Seligman is already a medallist of the Royal Anthropological Institute, having been awarded the Rivers Memorial Medal for 1926 in recognition of his work in the field in New Guinea, among the Veddas of Ceylon and in the Sudan. Prof. Seligman gained his first experience of field work as a member of the Cambridge University Expedition to the Torres Straits in 1898 under Dr. A. C. Haddon. He visited New Guinea again as joint leader of the Cooke-Daniels Ethnographical Expedition in 1904, publishing his results in "The Melanesians of British New Guinea" (1910). His studies of the Veddas in 1907, in which he was assisted by Mrs. Seligman, were published as "The Veddas" in 1911, while the results of his investigations among the Sudanese tribes on several occasions, on which he has again been accompanied and assisted by Mrs. Seligman, are announced for publication at an early date. The study in the University of London of the customs and races of man has made substantial advances during Prof. Seligman's occupation of the chair of ethnology at the London School of Economics, especially in the promotion and organisation of training for colonial officials.

#### Scientific Expedition to Tibet

IN February 1933 Capt. F. Kingdon-Ward is setting out to explore what is perhaps the least-known part of Tibet—the arc of mountainous country which lies between the bend of the Tsangpo-Brahmaputra and the bend of the Salween. The route to be followed is: the Assam valley, Sadiya, Lohit valley, Rima, up the Rong Thod Chu, over the Ata Gang Pass (16,000 ft.)