

made in the amplifiers between the microphones and the transmitting stations, and the range of audio-frequencies faithfully reproduced now extends up to 11,000 cycles per second. This should ensure that the quality of the broadcasting programmes is limited principally by the capabilities of the receiving instruments and the conditions under which they are used by listeners.

Manufacture of Telephones in Sweden

THE trouble taken by large manufacturing firms abroad to acquaint foreigners with their products and the work they have done is worthy of imitation. During this year, the telephone factory of L. M. Ericsson of Stockholm has published two reviews written in excellent English and well illustrated, each giving about 70 pages of most readable matter mainly about automatic telephones and exchange stations. There is a description of a system which notifies electrically on panels in a bank the quotations from the stock exchange immediately they are fixed officially. These panels can be inspected by the public. The methods of protecting transmission lines from excess voltages due to atmospheric electricity by means of condensers are described and a full scientific description is given of their action. There being so many wooden buildings in Sweden, there is a great demand for automatic fire alarm systems. When a fire breaks out, the effects of the fire itself acting on the device at once summon the fire brigade. The new Ericsson bakelite telephones are described. A description is given of automatic exchanges in Iceland, Norway and Finland and there are many beautiful photographs. With the beginning of this year, the firm started publishing a series of highly technical papers on the theory of telephony and allied subjects. Of the four we have seen, one is in French and three are in English. They record much of the work carried out by the Research and Development Department of the Company.

Railway Electrification

IN the *Electrical Supervisor*, the journal of the Association of Supervising Electrical Engineers, of November, the presidential address of Mr. J. M. Kennedy to the Association is given. Mr. Kennedy makes useful suggestions on problems relating to the economic development and co-ordination of the electric supply industry. He points out that although railway electrification is a straight economic issue based on no increase of traffic, he considers it a much more productive line of capital development than road transport. As a comprehensive scheme for the whole of Great Britain, it is only a paying proposition at the expense of a reduction of personnel and of the total amount of coal used. He considers that both these disadvantages are certain to be outweighed by countervailing advantages. The electrification of railways will give traffic managers a new method of attracting traffic due to greater acceleration, speed, cleanliness and general comfort. In addition, the shorter trains run at more frequent intervals, the absence of smoke, and better time-keeping will help. Experience on the Southern Railway so far

indicates that a very great increase in traffic is likely to result. A regular half-hourly service between London, Manchester and Birmingham would lead to a considerable increase in regular passenger traffic. Increased traffic will help to make good the apparent reduction in the number of employees, and the increase in electric production will also help. The electrification would not be completed for 15-20 years and would therefore be assisting employment continuously during this period. The increase in the efficiency of transport will also add its share to reducing unemployment to its normal level.

Gases in Metals

IT is known that the presence of a minute trace of gas in a metal may greatly change its properties. For example, the magnetic permeability of commercially pure iron is greatly increased by eliminating the small amount of gas which it contains. In the *Bell Laboratories Record* of September, E. E. Schumacher gives an interesting account of the methods employed to free metals from gases, particularly those used in the telephone industries. When the high degree of purity required for research purposes is desired, the metal is usually heated in a vacuum at a temperature above the melting point for a considerable time. But even at low pressures, sufficient gas may be left in the metal to be troublesome. When this occurs, alternately melting and partially solidifying the metal is employed in a high vacuum. In this way, almost complete elimination of the gas can be obtained. The metal to be freed of gas is placed in a shallow boat of fused aluminium oxide. This gives a large surface exposure and reduces the head of metal through which the gas must pass to escape. The apparatus is sealed in a pyrex glass tube connected to the pumping system. The tube is placed in a nichrome resistance furnace and a temperature of 450° C. is maintained until gas is no longer liberated. A high frequency coil is then substituted for the nichrome furnace and the metal is melted by induced high-frequency current. It is possible to keep the metal at its melting temperature indefinitely without heating the pyrex glass tube to its melting point. The final pressure may be as low as one thousand millionth of an atmosphere. The comparison of the properties of the purified samples with those of samples of any given gas content is of great importance.

Noiseless Underground Trains

A SERIOUS drawback to underground trains is the noise in the carriages when the train is in motion. In many cases this makes conversation even between people sitting next to one another difficult, if not impossible. It is interesting therefore to hear that experiments are being carried out on one of the busiest of New York subways with the object of eliminating most of the noise nuisance. According to the *Electrician* of December 15, five cars equipped with special noise-control devices have been placed in service by the Inter-borough Rapid Transit Co. with the object of finding out how they attract the public. If the silent cars attract the passengers, the

new type of car is to be standardised. It is estimated that the new type of car eliminates about ninety per cent of the noise inflicted upon passengers by the usual equipment. The new cars are said to be so noiseless that passengers can converse across the aisles without raising their voices. Doors and windows are kept closely shut. This excludes dirt and dust as well as noise. The ventilation is provided by electrically driven blowers suspended from the ceiling. The cost of installing the new equipment in the old type of car is about sixty pounds.

Mining Research at Birmingham

THE report of the work of the Mining Research Laboratory in the University of Birmingham during 1932 has been published. This is mainly financed by the British Colliery Owners' Research Association, and the investigations are largely addressed to the subjects of silicosis and nystagmus, which are costing the industry annually a very large sum of money. A great deal of work appears to have been done upon the determination of free silica in rocks, and it may be suggested that if the work of Dr. W. R. Jones, published in a recent number of the *Journal of Hygiene*, is supported by other observers, very much of this work may prove to be useless. On the other hand, the physiological and physical investigations on illuminations promise to be of great help in the matter of nystagmus. Other matters which have been investigated are such important points as the extension of the use of coal, the investigation of spontaneous combustion, the production of dangerous atmospheres in the mine, suitable wetting agents, etc.; and are bound to be of service to the coal mining industry. The report gives the impression of a year's very energetic work.

Industrial Design Competition

THE Royal Society of Arts has recently issued its report on the competition for industrial designs in 1933. For the six sections into which the competition was divided—architectural decoration, textiles, furniture, book production, advertising and commercial art and miscellaneous—2,623 designs were submitted by 1,131 competitors, of whom 724 were students of schools of art, Canada, Australia, New Zealand and South Africa being all represented. The report gives full details of the awards and much information about the prizes. Altogether a sum of £1,614 15s. 0d. was offered by the Society, the City Companies and various industrial firms, and since the competitions were started about ten years ago, the Society has expended about £5,000 on them. Unfortunately, for financial reasons the Council now finds it impossible to carry on the competitions, so none will be held in 1934. This is much to be regretted, for the competitions have proved of great educational value, and have proved that there is no lack of creative talent among the younger generation.

Liver Preparations and Œstrin

WE have received from the British Drug Houses, Ltd., London, N.1, leaflets describing their preparations of liver for use in the treatment of anæmia

and their preparation of œstrin called "Œstroform". For the treatment of pernicious anæmia, there is available liver extract in the form of a powder or in solution for oral or parenteral administration: the former two are pharmacopœial preparations; the latter is issued in 1 c.c. ampoules, each equal in anti-anæmic activity to 50 gm. fresh liver. Œstroform is a standardised preparation of ketohydroxyœstrin and is issued in ampoules for intramuscular or subcutaneous injection and in tablets for oral use, each ampoule or tablet containing 1,000 (international) units. Œstroform is of value in certain disorders of menstruation, in the vomiting of pregnancy and in prematurity of infants.

New Whale Hall at the Natural History Museum

FROM January 1 the exhibit of whales at the Natural History Museum will be closed to the public, and the removal of the specimens to the Hall in the new building, which was completed two years ago, will be commenced. Owing to the difficult economic position which has existed since the completion of the new building, money has hitherto not been available either for the removal of the exhibited specimens or for their erection in the new Hall. Means have, however, now been found to enable a start to be made with the work. Moreover, the old iron building in which the whales and dolphins have been exhibited for thirty-five years past is shortly to be pulled down to make way for a permanent building which is intended to provide storage and study-space mainly for the Department of Entomology.

Museum of Practical Geology

IN consequence of the impending transfer of offices, library and collections of the Geological Survey of Great Britain from the Museum of Practical Geology, Jermyn Street, to the new Museum in South Kensington, London, the Museum of Practical Geology will be closed to the public on and after January 1. The Library of the Geological Survey will remain open to the public until the transfer of the books commences. Entrance will be through the door in Piccadilly.

The Sky in January

VENUS, which has been a brilliant object in the sky during the last months of 1933, is now passing towards inferior conjunction, which is reached on February 5. The casual observer will see little of the planet until its next eastern elongation, but it will be a brilliant object in the early morning sky later in the year. By the middle of January, Mars will set about two hours after the sun; Jupiter will be an early morning object, rising six hours before the sun, and Saturn will be close to Mars in the evening sky. There will be a partial eclipse of the moon, partly visible at Greenwich, on January 30. The circumstances of this eclipse are as follows: Moon enters penumbra, 14h. 07m., leaves, 19h. 17m.; enters umbra, 16h. 01m., leaves, 17h. 20m. Middle of eclipse, 16h. 43m., magnitude, 0.12 (moon's diameter = 1).