

1934 (*J. Inst. Elec. Eng.*, Feb. 1935) is of general interest. The great technical progress made in broadcasting during the last two years is reflected in its rapid development. At the beginning of 1932, the number of licensed listeners in Europe was nearly 14 millions, and two years later it was nearly 20 millions. In 1929 the total power used in broadcasting was 420 kilowatts, whilst five years later it was more than ten times greater. Now that an average high-power station consumes 2 million electric units a year, it is important to use only transmitters of high efficiency. The extended use of short-wave telegraph working in ships has enabled the British P.O. stations to communicate regularly with whaling boats in the antarctic and in eastern waters. Directive aerials have been erected at these stations covering all the main shipping routes of the world, and this has greatly improved the services. Additional radio-telephone services from Great Britain to South Africa, Egypt and India have been opened up, while services to Japan, Shanghai, Kenya and Iceland are projected. By extension to circuits already existing, radio communication is now possible with nearly all the South American States. The outstanding feature in radio research has been the intensive study with the help of the cathode ray oscillograph of the propagation of waves in the ionosphere. The methods now in use indicate that the reflected signal resulting from a single pulse incident on the ionosphere consists frequently of a doublet the components of which are separated by a small time-interval. The reflected components are apparently electrically polarised waves of opposite rotational sense.

Machine Mining and Labour Problems

ALTHOUGH machine mining has made comparatively rapid progress during recent years, there is still room for a great advance in mechanisation. In a paper by Mr. J. Dooley, printed in the *Mining Electrical Engineer* of February, it is stated that in Yorkshire, which is one of the most progressive coal fields of Great Britain, only about one third of the coal produced is cut by machines and only about a sixth is loaded on to conveyor belts. There are a few coal seams from which coal simply rolls over into the 'tub', and it would be quite unnecessary to 'machine-cut' the faces of these seams. But even in these cases mechanical loading could be economically applied by means of conveyors of suitable design. Another economic factor which has to be taken into account is the possibility of a shortage of suitable labour in the near future. This question may rapidly become acute as newer and more attractive industries and interests arise to attract the boys and young men who would otherwise automatically enter the pits. It is true that to some extent machines displace labour temporarily, yet the position may be reversed, and collieries be compelled to put in machines because sufficient labour is not available. It is essential for colliery managers to get to work with new ideas, and arrange and organise systems of work so that full advantage be taken of the existing types of machinery. There are machines already in use

designed to carry enormous loads in supporting the roof and protecting other machines employed for cutting, loading and conveying coal simultaneously. American collieries have very large outputs per 'man shift', far in advance of anything ever attempted in Great Britain.

Pacific Science Association

THE Fifth Pacific Science Congress of the Pacific Science Association was held in Canada in 1933 under the presidency of Dr. H. M. Tory, president of the National Research Council of Canada. The Congress, which was held under the auspices of the National Research Council of Canada and through the generosity of the Government of Canada, was a notable achievement in the history of the Association. Representatives of no less than thirty-two countries attended the Congress, while the total number taking part in the meetings exceeded four hundred. The meetings were held in Victoria, B.C., on June 1-4 and in Vancouver, B.C., on June 5-14. The success of the Congress has now been crowned by the publication of the *Proceedings* in five large volumes amounting to more than four thousand pages (Toronto: University of Toronto Press; London: Oxford University Press, 1934. 5 vols. 84s. net). These volumes form a noteworthy summary of scientific knowledge from many aspects contributed by research workers of those countries bordering the Pacific Ocean. It is clearly not possible to review the contents of these volumes, but mention should be made of the lavish hospitality extended to the members and participants by the Canadian authorities. The many social functions and the interesting excursions arranged for the entertainment of the visitors must have largely fulfilled one of the main objects of the Pacific Science Association, which is "to strengthen the bonds of peace among Pacific peoples by promoting a feeling of brotherhood among the scientists of all the Pacific countries". This alone should be sufficient tribute to the devoted care and energy given by those responsible for the organisation of the Congress.

German Science

A NEW quarterly review in English of German science has appeared under the title "Research and Progress" (Terramare Office, Berlin W.8), the editor being Dr. Karl Kerkhof. In the second number, which appeared in April, the articles are mostly geographical or cultural and historical in character. Prof. Erich von Drygalski discusses the effect of the polar regions on the history of the earth, dealing with the influence of currents of air from the pole from the physical, biological and human points of view, while Prof. Rudolf Spitaler considers the influence of shifts in the earth's axis on the production of earthquakes. Prof. Diedrich Westermann deals with a subject on which he has already made his views familiar to English readers—the changing African. The introduction of syphilis from the New World in 1493 is characterised by Prof. K. Sudhoff as a legend; it is suggested, however, that it may have spread by earlier contacts between the Old

World and the New through eastern Asia. No reference is made to recent research, which seems to point to its existence in Europe in early pre-historic times. The cults and ritual of myth are discussed in two articles, one by Prof. K. Th. Preuss on the significance of birth and death and their relation to initiation and other forms of ceremonial in which sex is an element, and the second by Prof. Gustav Hübener, who regards the position of the hero in early epics as based upon his power as an exorcist. Although this does not exhaust the list of contents, mention can be made here of one other paper only—Prof. Erich Haenisch's interesting suggestion that the vertical arrangement in Chinese writing is due to the form of the ancestral tablet. The papers are brief, running to two or three pages only, and the treatment summary and popular. As a counter to English comment on Germany's 'purge', it does not make a really impressive showing.

Studies of the Rarer Elements

In his address as retiring president to the Chemical Society given on March 28 and entitled "Recent Researches on Certain of the Rarer Elements" (*J. Chem. Soc.*, p. 554, April 1935), Prof. G. T. Morgan outlined some of the most important advances which have been made in recent years in the study of the rarer elements. The British Empire is endowed with mineral resources to an extent unsurpassed by those of any other nation. It is obviously the duty of British chemists to undertake the systematic investigation of the rarer elements of the Empire, for it is certain that results of inestimable value will be forthcoming. Prof. Morgan is himself an outstanding leader in this kind of work and the results which he and his colleagues have accumulated form the main topic of the address. The extraction of germanium and gallium from Northumberland coal-ash has been started by Dr. G. R. Davies. Certain seams of Northumbrian coal give an ash containing up to 1 per cent of germanium and 0.05 per cent of gallium. The germanium is distilled out with acid as tetrachloride, whilst gallium trichloride remains in the still. A diagram of the apparatus is given. Rhenium has been extracted from Australian molybdenite by a lengthy process involving fractional volatilisation and ultimate separation with organic reagents such as 8-hydroxyquinoline and dipyrindyl. The address concludes with some notes on the co-ordination compounds of ruthenium, amongst which is an ammine which dyes natural silk in red shades but is extremely difficult to isolate in a state of purity.

A Central Statistical Institute

DESPITE the immense increase in the amount of statistical material which has become available during recent years, investigators still lack the data for even approximate measurement of many of the most important economic forces. In an article in *World Survey* of May 1935 entitled "The Case for Economic Measurement", Mr. G. D. H. Cole pleads for the establishment of a Central Statistical Institute in

Great Britain which would undertake the regular and prompt compilation and issue of this type of information, including regular surveys of production, prices, wholesale and retail trade, population movements and the like. He also advocates the publication of an annual "Progress of Britain Report" like that issued by the Government of India. The annual "Statistical Abstracts of the United Kingdom", it is true, go back nearly to the middle of the nineteenth century, and though greatly improved since the early issues, they have by no means been expanded in proportion to the development of the official *corpus* of statistics taken as a whole, and anyone who wants to collect the bare essentials of the current statistics in Great Britain has to work through much scattered material in numerous official publications. Mr. Cole also states that the publications of the Stationery Office on the subject are often expensive; while in most towns it is impossible to find any place where even the most important public documents can be consulted, and for private students or even small institutions, the cost of buying the bare minimum of requisite reports is excessive.

Prices of Biological Books in 1934

THE analysis of the cost of biological books in 1934, by John R. Miner (*Quart. Rev. Biol.*, Dec. 1934, p. 496), illustrates the significance of the devaluation of the dollar in affecting relative prices of American and foreign books. The estimates of cost are worked out in cents per page, the price of a foreign book being converted at the current rate of exchange, and the total number of pages upon which the calculations are based is 123,876. The only country in which prices have fallen is U.S.A. where (at 0.93 cents a page) there has been a drop of almost 9 per cent compared with 1933 prices. British Government publications have dropped from 1.39 to 0.89 cents a page and are now the cheapest of the lot apart from U.S. Government publications, which are issued at the amazingly low price of 0.18 cents a page; but the British Government sample was too small to be reliable. British books, on the other hand, have risen in terms of dollars by 45.5 per cent, French by 35 and German by 32. As to relative prices, British books now slightly exceed in price American books (0.96 against 0.93), France stands at 1.00 and Germany at 1.89 cents a page. As was noted in the report for 1933, the high prices of German scientific books and periodicals have proved a hardship to libraries and individual workers, and although as the result of a conference with German publishers some reductions in the prices of scientific periodicals have been made, evidently these reductions do not extend to scientific books.

Books on Horticulture

MESSRS. WHELDON AND WESLEY, LTD., of 2, 3 and 4 Arthur Street, New Oxford Street, London, W.C.2, have rendered a valuable service to gardeners by compiling a "Comprehensive List of Books on all Branches of Modern Horticulture, and a Selection of the Early Literature" (New Series, No. 39, 1935).