60 lakhs of rupees to the steel industry up to March 1927, after which date, when the Protection Act expires, the question will be reconsidered.

India assumed leadership in the production of manganese ore so early as 1907, and, after a relapse in the years 1912-15, regained it during the War period, in spite of much competition from Brazil. The report states, however, that discoveries of new and valuable deposits of manganese ore seem to have ceased, and that the period under review has been marked by stability in this section of the mining industry, accompanied by gradual development of some deposits and exhaustion of others. The average annual output of manganese ore for the period was 624,635 tons, compared with 577,457 tons in 1914-18, and 712,797 tons in 1909-13.

The output of chromite (chromium ore), which had increased substantially during the War period, continued to increase during the period under review, the average annual output being 35,000 tons as compared with an average of 23,000 tons for the previous quinquennium. The increase was due chiefly to greater activity in the chrome mines of Baluchistan.

The output of tungsten ore in Burma, which had increased greatly during the War period, having reached 4542 tons in 1917, dwindled during the period under review to an output of 872 tons in 1923. The tin output, on the contrary, showed an increase to an average annual of 138 tons (metal) compared with an average of 116 tons for the preceding quinquennium.

The gold-mining industry of India suffered during the War period, during which the average production was a little less than 587,000 ounces annually. The decline in output has continued steadily through the period under review, during which the average was 459,875 ounces.

Further marked progress is reported in the output of the lead-silver-zinc mines at Bawdwin and Namtu in Burma. The output of lead extracted from the ore at these mines rose steadily from 19,000 tons in 1919 to 46,000 in 1923, while that of silver increased from more than two million ounces in 1919 to about five million ounces in 1923.

India is the leading producer of mica of good quality. We learn, moreover, from this report that the art of producing fine splittings of mica by hand is practised more efficiently in India than in other countries, so much so that during recent years India has imported

mica for conversion into fine splittings for export. India also holds a monopoly in shellac production, which gives her power to control the production of micanite if necessary.

The average annual output of magnesite, chiefly from the deposits at Salem in Madras, increased by 77 per cent. in the period under review.

There was no progress in the jadeite industry during the period dealt with. The average annual exports amounted to 4628 cwt. as compared with 4651 cwt. during the previous quinquennium, but the value was much higher.

The output of monazite declined substantially during the period 1919-23, having fallen from 2000 tons in 1919 to only 125 tons in 1922.

The output of bauxite during the period continued low, averaging 5220 tons annually. The returns for 1924, however, show an increase to 23,228 tons of bauxite, from 6547 tons in 1923. By far the larger part of the 1924 production was from the Kaira district, in the Bombay Presidency.

Among new and interesting features in the mineral production of India, mention may be made of ilmenite, zircon, sillimanite, and kyanite. Ilmenite and zircon occur with monazite in the beach sands of Travancore, and are obtained as by-products in the magnetic concentration of the monazite. The outputs of ilmenite for 1922, 1923, and 1924 were 400, 700, and 641 tons respectively, while those of zircon were 160, 145, and 365 tons respectively.

Sillimanite has in recent years come into prominence as a refractory, and much interest has been taken in the deposit of the Khāsi Hills, Assam, which was formerly thought to be one of corundum. Four outcrops of sillimanite have been found, but the extent of the deposit is not known. The quantity of boulders, etc., at the surface is stated to amount to about 3000 tons. No sillimanite appears in the production statistics of 1923 and 1924.

A discovery of kyanite was made in the Lopso Hill area, Kharsawan State, Singhbhum, in 1921. Analyses show the rock to consist of practically pure aluminium silicate, and experiments show that it is suitable for use as a refractory. Several hundred tons have been sent to England, and it is thought that a demand for it as a refractory may arise. An output of 224 tons of kyanite is reported in the production statistics of the Geological Survey for 1924.

T. C.

Obituary.

MR. J. H. MAIDEN, I.S.O., F.R.S.

ON November 16, at his residence, Turramurra, Sydney, the death occurred of Joseph Henry Maiden, who in 1924 retired from the position of Director of the Sydney Botanic Gardens and Officer-in-Charge of the Centennial Park. Mr. Maiden was born at St. John's Wood, London, on April 25, 1859, and received his early education at the City of London Middle Class School. He soon showed a taste for science, and for some time was assistant to the late Prof. F. Barff. He came to Australia in 1880, for health reasons, having provided himself with a return ticket, but the climate proved so beneficial that he decided to remain, and became associated with the

formation of the Technological Museum, Sydney, of which he was Curator from 1881 until 1896, and he soon began to study the native plants. Some of his early botanical lessons were learnt from the late Rev. Dr. William Woolls, of whom he always retained the most affectionate memories. He was also a colleague in botanical work of the late Baron von Mueller in his latter days, another of the great pioneers of Australian botany. Mr. Maiden was Superintendent of Technical Education from 1894 until 1896; Consulting Botanist to the Departments of Agriculture and Forests from 1890; Director of the Botanic Gardens, Sydney; and Government Botanist from 1896 until his retirement in 1924.

The particular genus which Mr. Maiden studied most intensively was that almost exclusively Australian one—*Eucalyptus*—and he added very many new species to the list previously known, his field of investigation extending all over Australia. By his enthusiasm and energy he formed the present Herbarium at the Sydney Botanic Gardens, one of the finest in the southern hemisphere, and made many personal journeys in the various States for material to enrich his collections. He also, at considerable trouble, obtained type specimens which were collected in Australia in the early days, but had been housed in herbaria in other parts of the world, including some collected by Sir Joseph Banks in 1770.

Perhaps Mr. Maiden's greatest work in the field of botanical research is his "Critical Revision of the Genus *Eucalyptus*," of which sixty-four parts have already appeared and others are going through the press. Another valuable publication is the "Forest Flora of New South Wales," of which seventy-seven parts have been issued. Other publications included "Illustrated Flowering Plants and Ferns of New South Wales" and "Useful Native Plants of Australia." He made numerous contributions on various subjects to the *Agricultural Gazette of New South Wales*, and the service he has rendered in the interest of forestry in this State has been very great.

Mr. Maiden was honorary secretary of the Royal Society of New South Wales for twenty-two years, and president in 1896 and 1911; president of the New South Wales Horticultural Society for twenty years and of the Horticultural Association for eighteen years, as well as president of the Linnean Society of New South Wales and the Royal Australian Historical Society, in each case for two years. He was a man full of energy, and one of the most outstanding features of his activities was his industry. He never seemed to tire of writing up and placing on record any scientific facts which made for the advancement of knowledge, his contribution to the Royal Society of New South Wales being forty-five papers, the last having been presented in 1925, while his papers to the Linnean Society of New South Wales amounted to ninety-five. He entertained a very high regard for Sir Joseph Banks, whom he styled "The Father of Australia," and his biography of Sir Joseph, written chiefly for the purpose of raising funds for a memorial to that great botanist, is considered to be a classic. Mr. Maiden was one of the chief originators of the National Wattle Day Celebration in the Commonwealth, which has for its object the cultivation of an Australian national sentiment, while keeping in view that this country forms part of the British Empire.

In 1915 Mr. Maiden was awarded the Linnean Medal by the Linnean Society of London, this being the first occasion upon which this medal had been won by an Australian. He was elected a fellow of the Linnean Society in 1888, and in 1916 was honoured by having the Imperial Service Order conferred upon him, and also by being elected a fellow of the Royal Society. In 1921 he was offered the presidency of the Australasian Association for the Advancement of Science, but declined it for health reasons, and in 1922 was awarded the Mueller Medal by that body, of which he was honorary secretary for fourteen years; in 1924 he

gained the Clarke Memorial Medal awarded by the Royal Society of New South Wales.

Mr. Maiden ranks among the half-dozen leading pioneering botanists who have contributed so much to our knowledge of the unique Australian flora, and for many years was regarded as the doyen of Australian botanists. He served as an inspiration to very many science students, probably more than ever will be known, and as some evidence of the affection and esteem in which he was held by his colleagues in science he was, in 1916, presented with his portrait in oils. In addition to the amount of scientific work which he carried out as the result of his own investigations, he was an outstanding benefactor to scientific progress generally, and being a born organiser added great strength to those societies which were reached by his influence. Truly it may be said of him that he left the world richer for his labours, and his life was filled with greatness, nobility and sincerity.

R. H. CAMBAGE.

WE regret to learn from the *Chemiker-Zeitung* of the death of Dr. Erich Krause, director of the laboratories of the Wood Carbonisation Co. of Constance. Krause was born at Weissenfels and educated at Leipzig and Vienna. At Vienna he became assistant to Prof. Skraup, in conjunction with whom much of his original work was published. The researches were partly in organic chemistry and partly in physical chemistry and were concerned mainly with the investigation of proteins. In 1911 he entered the service of the Holzverarbeitungs-Industrie, when he devoted his energies to the perfection of analytical methods, his main results being published in the new edition of the well-known work of J. König, "Die Untersuchung landwirtschaftlich und gewerblich wichtiger Stoffe." In collaboration with his colleagues he worked out a process for obtaining methyl alcohol from natural gas. During the War, Krause devoted much time and attention to the problem of finding food-substitutes.

WE regret to announce the following deaths:

Dame Louisa Aldrich-Blake, D.B.E., Dean of the London (Royal Free Hospital) School of Medicine for Women, one of the first among medical women to practise general surgery, on December 28, aged sixty years.

Prof. Matthew Curry, formerly professor of engineering at King's College, London, on December 29, aged seventy-four years.

Dr. C. Gessard, of the Institut Pasteur, Paris, who isolated a pyocyanic bacillus from pus in 1882, and was also known for his work on oxydases and on bacteria generally.

Dr. J. G. M'Kendrick, F.R.S., emeritus professor of physiology in the University of Glasgow, on January 2, aged eighty-four years.

Prof. Alfred Perot, professor of physics in the École Polytechnique, Paris, and president of the Commission de Métrologie, on November 27, aged sixty-two years.

Sir R. Douglas Powell, Bart., K.C.V.O., physician in ordinary to the King, president of the Royal College of Physicians in 1905-10, and formerly president of the Royal Medical and Chirurgical, the Clinical and Medical Societies, on December 15, aged eighty-three years.