the Marconi–E.M.I. system, which is in use in the recently re-opened service from Alexandra Palace.

During all these years and until a few months before he died, Baird continued to work steadily towards the improvement of the scope and possibilities of television and its presentation. The system which bears his name had early taken advantage of the cathode ray tube for reception of the transmitted picture; and in December 1937 he demonstrated in London the optical projection of television pictures on to a cinema screen. The possibilities of introducing colour and stereoscopic effects had for many years also aroused his interest, and in 1944 he gave a demonstration of his recent achievements in the reception of television in colour by a method which avoided the need for revolving disks and lenses.

Altogether Baird played a notable part in stimulating the development of many aspects of television technique, and undoubtedly contributed materially towards the success attained by radio engineers and physicists, resulting in Britain being in the forefront of the world in this fascinating application of electromagnetic waves. R. L. SMITH-ROSE

Prof. Amadeus W. Grabau

AMADEUS W. GRABAU was born of German stock at Cedarburgh, Wisconsin, on January 9, 1870, his father and paternal grandfather being Lutheran Church pastors. His grandparents had left Germany in the middle of last century to seek refuge in the United States from persecution for refusal to conform to the practices of the reformed Lutheran Church. Perhaps it was this ancestry which bred in Grabau that stubbornness and refusal to accept current geological dogma without challenge which characterized his career. His radical opinions, expressed with a forthrightness not always to the liking of more conservative minds, touched not only American and Asian geology, but also impinged forcibly on the fundamentals of world geology.

At the age of fifteen, Grabau was apprenticed to a bookbinder in Buffalo, N.Y., but he continued his education at evening classes, discovering the delights of botany and geology. His ability in a correspondence course in mineralogy led Prof. W. O. Crosby, of the Massachusetts Institute of Technology, to offer him in 1890 a post at the Boston Society of Natural History and a special studentship at the Institute. The young man now came into contact with a brilliant gathering of teachers and he responded readily to their influence. His interest in physiography was sharpened, but to it was added a lively knowledge of marine bionomics and, through Alpheus Hyatt and R. T. Jackson, of palæontology. He graduated in 1896, and entered Harvard University in 1897, where he took his master's (1898) and doctor's (1900) degrees. By way of Tuft's College, the Rensselaer Polytechnic Institute and the Geological Survey of Michigan, Grabau passed to a lectureship in palæontology at Columbia University in 1901, becoming full professor in 1905.

Grabau had already published a number of studies on Pleistocene geology, such as "The Pre-Glacial Channel of the Genesee River" (his first paper) and on glacial phenomena of Cape Cod and of Glacial Lake Bouvé. But the richly fossiliferous Lower Palæozoic and Devonian rocks of New York State were an equal attraction, and he published papers on their faunas. In addition, he speculated (sometimes from unsound premises, as with the Fusidæ) on the phylogeny and bionomics of the fossil groups—Devonian fishes, Palæozoic corals and coral reefs, graptolites, gastropods, etc., all passed beneath his scrutiny. These essays were related to numerous others on the classification, nature and formation of sedimentary rocks and of salt deposits; for example, his book "Geology of the Non-Metallic Mineral Deposits other than Silicates. Vol. I. Principles of Salt Deposition" (1920). Grabau's widely ranging interests in stratigraphy, palæogeography, palæontology and sedimentation were, however, inter-related in his mind, and were synthesized into a whole in his "Principles of Stratigraphy" (1913). He stoutly advocated his views at meetings of the Geological Society of America, where his clashes with E. O. Ulrich and A. E. Foerste, who held other opinions equally strongly, became legendary. But the storms of the meeting-room were always followed by peace-making discussions afterwards.

The War of 1914–18 brought a crisis in Grabau's affairs. In an America where the teaching of German at public schools was banned and where streets and places with German names were re-christened, any defence of German literature, arts and science could not be tolerated. But Grabau commended these contributions to world culture, stubbornly refused to explain his views more fully, and ultimately left Columbia. China seized the opportunity and offered him the post of chief palæontologist to the National Geological Survey of China and professor of palæontology at the National University of Peking, which he accepted in 1920.

Grabau plunged with vigour into his new tasks, and quickly built up a flourishing school at the University of Peking. The mass of palæontological material in the collections of the Survey was a mine he explored eagerly. The faunas of China were revealed, with adequate descriptions and figures, in a flood of monographs and papers by Grabau and by students he had trained. His own palæontological contributions were more particularly on the Palæozoic corals and brachiopods, though they embraced other groups from almost every age, and inevitably included discussions of their bionomics. The implications of this work on Chinese stratigraphy were quickly grasped by Grabau, and within four years of his arrival in that vast country he issued the first volume of his "Stratigraphy of China" (volume 2 came out in 1928), wherein he put forth new hypotheses to solve the difficult questions, while he later published a series of papers on "Problems in Chinese Stratigraphy". His "Permian of Mongolia", volume 4 of "Natural History of Central Asia", was the vehicle for a discussion of the Permian of the world, where his original ideas once more coloured a long-drawn-out debate. He held strong views on the migration of geosynclines, and in a number of papers on the pulsation theory strenuously advocated universal transgression and regression for a given geological period. His "Rhythm of the Ages", published in 1940, is characteristically stimulating and full of ideas.

The Geological Society of China honoured Grabau by founding the Grabau Gold Medal, of which he was the first recipient in 1925, while later it celebrated his sixtieth birthday by dedicating volume 10 of its *Bulletin* to him. Its preface, signed by the eight leading Chinese geologists, is a moving testimony to the regard which he had won in his adopted country by the same inspiring enthusiasm, kindly under-

standing and homely hospitality that are not forgotten by his old American students.

In 1933 Grabau re-visited America and was pleased at his welcome and at renewing personal contact with his old friends and antagonists, Foerste and Ulrich. Though some of the old narrow prejudices persisted even later in some quarters, this visit did much to relieve the mental suffering he had so long endured. By then he was already painfully crippled by rheumatism which progressively worsened. He kept bravely on, however, and it is remarkable that such a mass of research work and of ideas could have been produced by one who suffered so severely. The Japanese invasion of China brought increasing difficulties to Grabau. When the Geological Survey and the National University of Peking moved to Kunming, Yunnan, in 1937, his illness forced him to be left behind; but he struggled on, formulating and publishing his ideas, while his Chinese friends got food and money to him whenever possible. After the Pearl Harbour incident, he was housed by the Japanese in the old British Embassy in Peking, but the lack of food and attention and his utter hatred of the Japanese aggression told heavily on the old man. He was very ill bodily and mentally when he was liberated in September, 1945, and despite the care of the authorities of the Geological Survey, he died on March 20, 1946, after internal hæmorrhage. He was a widower with one daughter.

H. Dighton Thomas

NEWS and VIEWS

Newton Tercentenary Celebrations

The three hundredth anniversary of the birth of Isaac Newton fell on December 25, 1942. At that time an international celebration to mark the occasion was out of the question, but the Royal Society devoted the greater part of its anniversary meeting on November 30 of that year to lectures on Newton and his work. Sir Henry Dale, who was president of the Royal Society at that time, spoke in general terms of the significance of Newton as an outstanding figure in the progress of Western science and philosophy. Lectures were given by Prof. E. N. da C. Andrade, Lord Rayleigh and Sir James Jeans, which we were able to print in *Nature* of December 19, with an article by Prof. S. Brodetsky on Newton as scientist and man. The Physical Society and other learned bodies also had special lectures.

As announced by Sir Robert Robinson in opening the Royal Society Empire Scientific Conference, the Society arranged to hold a celebration of wider scope which began on July 15. Delegates from many foreign academies were present and also representatives attending the recent Empire Scientific Conference. The delegates were welcomed by Sir Robert Robinson, who stated in the course of his address that the Royal Society has recently proposed to the British Government a scheme for an Isaac Newton observatory as a national memorial. The scheme provides for a 100-in. reflector and other modern astronomical equipment. The observatory would be the property of the Government, but it would be available for the use of investigators from other observatories. Among the addresses and gifts presented to the Royal Society on this occasion was a copy of a Russian translation of the "Principia" presented by the delegation from the U.S.S.R.

Other items from the programme of the week's celebrations were lectures by Prof. E. N. da C. Andrade on "Isaac Newton"; by the late Lord Keynes (read by Mr. Geoffrey Keynes) on "Newton, the Man"; by Prof. J. Hadamard on "Newton and the Infinitesimal Calculus"; by Academician S. Vavilov (read on his behalf) on "Newton's Atomism"; by Prof. Niels Bohr on "Newton's Principles and Modern Atomic Mechanics"; by Prof. H. W. Turnbull on "Newton: The Algebraist and Geometer"; by Dr. Walter Adams on "Newton's Contributions to Observational Astronomy"; by Dr. Jerome C. Hunsaker on "Newton and Fluid Mechanics". The King and Queen invited delegates to a garden party, and there were visits to the Covent Garden Opera House for a performance by the Ballet Theatre of New York, to Cambridge and the Royal Mint, and a reception by the Lord Mayor and Corporation of the City of London.

British Commonwealth Scientific Official Conference

Mr. Herbert Morrison, Lord President of the Council, opened the British Commonwealth Scientific Conference on July 9. He said that the Royal Society Conference which had just closed was an admirable preparation for the official Conference, in that it provided many opportunities for both formal and informal discussions. Mr. Morrison suggested that a guiding principle in dealing with any problem before the official Conference should be, first, what it is desired to achieve, and then how the desired results can be best brought about and what additional machinery, if any, is necessary for the purpose. It is possible, he warned, to pay too much attention to organisation. If there is the will to co-operate (and there is abundant evidence that this exists throughout the Commonwealth), then very frequently the means follow naturally. It is important to remember, he said, that throughout the British Commonwealth we shall be faced for some years to come with an acute shortage of scientific man-power; and there is a risk that too elaborate organisation may result in absorbing into the administrative machine many scientifically trained men who are badly needed in research laboratories. Careful distinction must also be made between subjects on which work can be safely left to develop along its own lines in the individual countries of the Commonwealth and Empire, and subjects in which successful collaboration demands closely similar methods being employed by all engaged in the work. In the former case, full collaboration can be achieved by ensuring that individual investigators, wherever they may be working, know what others are doing and are able to meet at intervals for discussion of results. The other type of work requires the adoption of concerted plans of action. Mr. Morrison pledged the Government to give most careful and sympathetic consideration to recommendations made by the Conference; and he declared that the Government is determined that science shall play its proper part in the formation