Obituary

SIR ERNEST MOIR, BT.

WE regret to record the death, which occurred on June 14, at the age of seventy-one years, of Sir Ernest William Moir. Born on June 9, 1862, Moir in the early part of his career came into close contact with Fowler, Baker, Arrol, Wolfe-Barry and other eminent civil engineers and during his long and distinguished career as a partner in the firm of Messrs. S. Pearson and Son, Limited, worthily upheld the high traditions of those who, as contractors, are responsible for carrying out works of the greatest magnitude. Both in his presidential address on "Engineering Difficulties" to the Junior Institution of Engineers in December, 1929, and his address entitled "The Interdependence of Science and Engineering, with some Examples", given as president of Section G (Engineering) at the Bristol meeting of the British Association in 1930, he made many interesting references to some of the important undertakings with which he had been associated; and as "the first contracting civil engineer who has been honoured by the British Association", at Bristol he appropriately dealt at considerable length with the economics of engineering construction. Another section of his address was devoted to the bacteriological and entomological sciences and their influence on civil engineering.

Educated first at University College School, and then at University College, London, where he studied under Kennedy and Vernon Harcourt, Moir began his practical training in the yards and shops of Messrs. R. Napier and Sons, Glasgow, of which Dr. A. C. Kirk was the manager. His first important task was the building and launching of the large caissons for the foundations of the Forth Bridge. Joining the staff of Messrs. Tancred, Arrol and Co., he was employed on the construction of the south cantilevers of the bridge and then through Sir Benjamin Baker was sent in 1889 to New York to assist in the completion of the Hudson River (North) Tunnel which had been started in 1874, only to be abandoned in 1888. It was in connexion with the work on this tunnel that he introduced the use of recompression chambers for men working in compressed air. The use of this medical air lock reduced the death-rate among the staff, which in 1890 had been 25 per cent per annum, to 1½ per cent.

By this time, Moir had become a member of the firm of Messrs. S. Pearson and Son, of which the late Lord Cowdray (1856–1927) was long the head, and as such he was responsible for the construction of the Blackwall Tunnel beneath the Thames, a difficult piece of work successfully completed in 1897. Afterwards, Moir was connected with the construction of the four railway tunnels under the East River from New York to Long Island and with harbour work at Seaham, Dover and elsewhere. His latest important undertaking was the construction of the great breakwater at Valparaiso, founded in 187 ft. of water. The base of this breakwater consists of a huge bank of deposited sand, while the upper part of the structure is composed of 60-ton concrete blocks interlocked with each other. An account of this work was given to the Institution of Civil Engineers in December, 1931, by Mr. W. F. Stanton.

Appointed a member of the Admiralty Engineering Committee in 1912, from 1916 until 1919 Moir held important positions under the Ministry of Munitions and in 1924–25 was chairman of the Government Committee on New Methods of House Building. He was made a baronet in 1916 and is now succeeded in the title by his younger son, Capt. Arrol Moir.

News and Views

Prof. Manne Siegbahn

AT a meeting of the Physical Society held on June 16 the tenth Duddell medal was presented to Prof. Wolfgang Gaede (see NATURE of Feb. 11, p. 195). The presentation was followed by the delivery of the eighteenth Guthrie lecture by Prof. Manne Siegbahn, professor of general physics in the University of Uppsala, on "Studies in the Extreme Ultra-Violet and the Very Soft X-Ray Region". It is largely due to Prof. Siegbahn's technical and experimental skill, backed by a wide knowledge of physical science, that our present acquaintance with atomic structure has made such remarkable progress. In 1912, von Laue first gave experimental proof that the X-rays resembled light in all respects except that the lengths of their ether waves were many thousands of times shorter. His method was based upon the supposition that the ordered array of the atoms in a crystal would act upon X-rays just as, in familiar ways, a grosser array of particles or lines or obstructions of any kind act upon the longer waves of light, so causing such phenomena as the halo round the moon, or the colours of mother of pearl, or the iridescence of wings and wing cases of certain insects. The successful experiment at once opened the way to two separate lines of research, both of which have been rich in results. The first has led to our rapidly growing knowledge of the crystalline state of matter, including the bodies which are crystals *par excellence*. The other was first followed by Moseley and Darwin, who employed the new methods in the investigation of the X-rays themselves.

IT was then that Siegbahn, following the same line of research, began his investigations. He effected improvements in the design and construction of apparatus for measuring the wave-lengths of X-rays

which have endowed them with an accuracy comparable with the corresponding optical instruments. It is amazing to look back over the last twenty years to the experiments with which this work began, and to compare their crudity, which nevertheless could not hide their obvious importance or the magnificence of their promise, with the finish of to-day. It is largely to Prof. Siegbahn that we owe the modern precision, and the fulfilment of that promise. His extremely accurate measurements of the lengths of the waves which the various atoms emit, serve as definite indications of their internal structure, and every improvement has brought new and valuable information. Not often has refinement of instrumental design and use brought such a plentiful and immediate harvest. It is interesting to note that it was Ångstrom, also a Swede, who first realised the accuracy in optical measurements which necessitated the choice of a special unit of length for their description. Ångstrom himself measured the lengths of waves of light and found them to be a few thousand of his units : the wave-lengths of X-rays are of the order of a single unit.

Dr. Michael Polanyi

DR. MICHAEL POLANYI has accepted a chair of physical chemistry in the University of Manchester, and will take up the post at the beginning of the next session. Dr. Polanyi, who is a Hungarian by birth, studied medicine in the University of Budapest and chemistry in the Technical High School of Karlsruhe. After service as surgeon with the Austrian forces during the War, he became assistant to Prof. Hevessy, professor of theoretical chemistry at the University of Budapest. In 1919 he returned to Karlsruhe, since when he has held posts in the Kaiser-Wilhelm Institute for Textile Chemistry, the Technical High School in Berlin, and the Kaiser-Wilhelm Institute for Physical and Electro-chemistry. Dr. Polanyi is a well-known physical chemist. His first notable research was a theory of adsorption, published in 1917 ; he has also made discoveries in connexion with the structure of cellulose and the mechanical properties of metals and other solids. His present investigations relate to the theoretical and experimental study of reaction kinetics and the mechanism of chemical reactions. It is this line of research which, it is anticipated, he will pursue in Manchester.

Johann Jacob Scheuchzer, 1672–1733

THOUGH as a science, the birth of geology dates only from the latter part of the eighteenth century, prior to that many men had been interested in the study of rocks and fossils and had recorded valuable observations. Among these men was the Swiss doctor, Johann Jacob Scheuchzer, the bicentenary of whose death occurs on June 25. Born at Zurich on August 4, 1672, Scheuchzer qualified as a doctor at Utrecht and paid some attention to mathematics. For many years he held a professorship in his native city. His main interest, however, was in natural history and especially in fossils and minerals. He translated Woodward's "Natural History of the Earth" into Latin and published several works of his own. Included in these was his "Itinera per Helvetiæ Alpinas Regiones" (1702–11), in which for the first time glaciers are mentioned as a subject for scientific investigation. He gave careful descriptions of several glaciers he had visited and explained their movement as a result of the infiltration and freezing of water in cracks and other spaces. He was thus the founder of the theory of dilatation, afterwards advocated by Charpentier and Agassiz. His natural history of Switzerland contains a special chapter dealing with what Scheuchzer thought were fossils left by the Great Deluge, and towards the close of his life he thought he had discovered in the beds at Oeningen, between Constance and Schaffhausen, the skeleton of one of the "infamous men whose sins brought upon the world the dire misfortune". But the supposed *Homo diluvii* was afterwards shown by Cuvier to be a reptile and it was called *Andrias Scheuchzeri* in honour of its discoverer. The specimen was presented to the Teyler Museum at Haarlem.

Vivisection of Criminals

THE BISHOP OF DURHAM set the ball of controversy rolling when he delivered the eighth Fison memorial lecture on June 15 at Guy's Hospital on "Ethical Conditions of Scientific Method". After discussing the case for and against vivisection of animals, he submitted the question whether in no case might man be subjected to vivisection in the interest of science. Dr. Henson asked if there was any objection to the vivisection of criminals who, by the law of their country, had been condemned to death. In their case, the issue of inherent rights could not be raised, for these had already been cancelled, and they were dealt with penally on this hypothesis. Why should not the punishment of a criminal take a form which was serviceable to the community ? Why should he not at least be given the opportunity of making in this way some atonement for his sins against society ? At present, deductions drawn from the responses of the anthropoid apes or even dogs have to suffice, where direct experiment on man would present a speedier route to knowledge. This applies to human physiology, especially of the nervous and digestive systems and in a lesser degree to pathology as regards infectivity and immunity. There is, of course, the possible difficulty to be encountered in finding an experimenter, at any rate in England, who would impose conditions which might not meet with the penal requirements. In any event, the subject bristles with difficulties the discussion of which would take up more space than is available in these columns.

International Ornithological Congress

THE eighth International Ornithological Congress is to be held at the University of Oxford in July 1934, under the presidency of Dr. E. Stresemann, of Berlin. The International Ornithological Congress was originally held every five years, but at the last Congress, at Amsterdam in 1930, when the president was Dr. E. Lönnberg of Sweden, it was decided to hold it