

of Bengal," 1879, p. 16, Pl. I; 1888, p. 404; and 1893, p. 289, Pl. XIII; and "On the Mode of Occurrence of Precious Stones in India," 1884, p. 516; "On Eroded Agate Pebbles," 1888, p. 231; "On the Transport of Granite found in the Carboniferous Limestone, Dublin," 1888, p. 232. He filled the office of President at the late meeting of the Museums Association in Dublin in 1894. With most of the scientific societies of Dublin Dr. V. Ball was in intimate association, especially with the Royal Geological Society, of which he was the arduous Secretary for so many years.

In 1869 Dr. Ball married the eldest daughter of the late John Stewart Moore, of Moyarget, county Antrim. He leaves a family of four children. For some years Dr. Ball's health had been failing. About ten days previous to his death serious symptoms were manifested, and he passed away on the afternoon of Saturday, June 15th, at his residence, 28, Waterloo Road, Dublin.

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PROFESSOR WILLIAM C. WILLIAMSON, LL.D., F.R.S.

BORN NOVEMBER 24TH, 1816.

DIED JUNE 23RD, 1895.

By the death of Professor W. C. Williamson, Palæobotany has lost one of its most earnest and energetic investigators and exponents, whose memoirs will long remain a record of persevering labour combined with remarkable genius and originality of thought.

William Crawford Williamson was born at Scarborough on November 24th, 1816. His father was for some time head gardener to the then Earl of Mulgrave, at Lyth Castle, near Whitby, where, having laboured indefatigably in exploring the geology and zoology of the coast of Yorkshire, and made a rich collection of its fossils and recent shells, he was, in 1828, appointed Curator of the well-known Museum of the Literary and Philosophical Society of Scarborough, amongst the collections of which much of his son's early youth was beneficially spent. Young Williamson was destined for the medical profession, but, in 1835, accepted the curatorship of the Museum of the Manchester Natural History Society. Whilst at Scarborough he contributed to the Geological Society of London the first of three memoirs on the "Vertical Distribution of the Organic Remains in the Strata of the Yorkshire Coast," and one to the Zoological Society of London on the "Birds of the Yorkshire Coast," as well as published a description of the well-known tumulus and its contents then recently opened on Gristhorpe Cliff. On reaching Manchester his attention was at once directed to the local geology, and soon resulted in the publication, in the Philosophical Magazine, of a memoir on the "Remarkable Limestones of Ardwick," which form the uppermost part of the Carboniferous strata in that neighbourhood.

In 1838 he resumed his medical studies, first in the Manchester Medical School, Pine Street, and afterwards in University College, London; and in January, 1841, he commenced as a medical practitioner in Manchester. Soon after that he began a series of investigations amongst the recent Foraminifera, the results of which were a succession of memoirs on their minute organization,

culminating, in 1848, in the publication, by the Ray Society, of his "Monograph on the Recent Foraminifera of Great Britain," and in a memoir on the minute organisms found in the marine mud of the Levant. This latter memoir contained the first announcement of the existence in some of the deeper seas of what is now known as the Foraminiferal Ooze. The study of some histological features of human bones and teeth led to an examination of the scales and bones of recent and fossil fishes. Two memoirs on these subjects were published in the Philosophical Transactions of the Royal Society, in which he announced his conclusion that the scales and dermal teeth of fishes were the homologues of the oral teeth of the mammalia, the latter being but the relics of the dermal system so extensively developed in fishes. The publication of these two memoirs led to his election as a F.R.S. in 1854. In 1851 the Owens College of Manchester began its career, when Mr. Williamson was elected its first Professor of Biology and Geology. As the institution expanded, this too-comprehensive chair was divided, and for many years past his academic labours had been confined to the Professorship of Botany. Circumstances then drew his attention to the Carboniferous plants of Lancashire and Yorkshire. The result of these later studies has been the publication, in the Philosophical Transactions, of seventeen memoirs "On the Organization of the Fossil Plants of the Coal-measures." On receiving the sixth of this series, the Royal Society recognized them by awarding him their Royal Medal. The Wollaston Gold Medal of the Geological Society was awarded to Dr. Williamson in 1890. Dr. Williamson was President, and subsequently senior Vice-President, of the Literary and Philosophical Society of Manchester. The University of Edinburgh conferred upon him the degree of LL.D. The Göttingen Academy of Sciences elected him one of its foreign members, and the Royal Society of Sweden elected him to the place left vacant by the death of Professor Asa Gray.

In the Royal Society's Catalogue of Scientific Papers from 1834 to 1873 is a list of 57 papers, principally upon microscopic organisms, Foraminifera, Radiolaria, etc.; on the microscopic structure of the scales, bones, and teeth of Fossil Fishes and Reptiles, and a most important series on the structure of coal-plants, *Calamites*, *Stigmaria*, *Sigillaria*, *Lepidodendron*, etc., with which his name will for ever remain honourably associated.

Prof. Williamson had retired from the Owens College, Manchester, for some time before his death, and had been residing at Clapham, where he had occupied himself with Dr. D. H. Scott, F.R.S., Hon. Keeper of the Jodrell Laboratory, Kew, in carrying on his researches in the microscopic structure of Fossil Plants, to illustrate which he had accumulated an immense and valuable series of microscopical sections and specimens.

Prof. Williamson having passed so many years of his life in Manchester had never become a Fellow of the Geological Society of London, although he was the recipient of its Wollaston Medal in 1890. He died at the age of 78 years, having been actively engaged up to a short time before his death.