

This was new work to Mr. Cudworth, but his love for ships and shipping made it congenial.

In 1883, shortly after the death of his wife, he retired from professional life, and devoted the prolonged remainder of his days to works of philanthropy and to literature. Possessing a cultivated literary taste, he occupied himself in making translations into English verse of several of the masterpieces of Greek and Latin literature. When over 80 years of age he learned Italian in order to read Dante in the original. He died on the 4th June, 1906, in his ninety-first year. Mr. Cudworth was ever calm in demeanour and careful and exact in his use of language; and he was eminently just and upright in all the affairs of life.

He was elected a Member of the Institution on the 1st May, 1860.

JAMES DREDGE, C.M.G.,¹ born at Bath on the 29th July, 1840, was the son of Mr. James Dredge, of that city, an engineer well known as the designer of a form of suspension bridge with inclined suspension-rods carrying the roadway; a type of which a number of examples were erected in different parts of the country. The subject of this notice commenced his professional training at an early age under his elder brother, the late Mr. William Dredge, who was established in London as a civil engineer. In 1858 he entered the office of the late Mr. D. K. Clark, remaining with him until the year 1861, and during this period he made the acquaintance of the late Mr. Zerah Colburn, at that time editor of *The Engineer*. In 1862 Mr. Dredge entered the office of Mr. (afterwards Sir John) Fowler, by whom he was employed for some years on work connected with the construction of the Metropolitan District Railway.

In 1865 Mr. Colburn, having resigned the editorship of *The Engineer*, decided to establish a journal of his own, with the result that the first number of *Engineering* was published in January, 1866. Mr. W. H. Maw became sub-editor of the new paper, while Mr. Dredge took charge of matters connected with illustrations and also occasionally contributed editorial matter. Early in 1870, upon the death of Mr. Colburn, Mr. Dredge joined Mr. Maw as co-editor, and he continued to take a very active part in the management of the affairs of the paper until he was stricken with an attack of paralysis in May, 1903.

¹ This notice is based on the memoir which appeared in *Engineering*,

Contemporaneously with his editorial work, Mr. Dredge for more than 30 years took an exceedingly keen interest in international exhibitions. In addition to his work for *Engineering* in connection with the Vienna Exhibition of 1873, the Centennial Exhibition at Philadelphia of 1876, and the Paris Exhibitions of 1878 and of 1889, he was a member of the Royal British Commission for the Chicago Exhibition of 1893, was officially connected with the Antwerp Exhibition of 1894, served as Commissioner-General for Great Britain for the Brussels Exhibition of 1897, and was one of the Vice-Presidents of the British Commission for the Milan Exhibition of 1906. For his work in connection with the Paris Exhibition of 1889 he was appointed an Officer of the Legion of Honour, and for his services with respect to the Brussels Exhibition he was made a Companion of the Order of St. Michael and St. George.

Mr. Dredge made several visits to the United States, where he was well known and had numerous valued friends. The first of these visits took place early in 1868, when he wrote accounts of several American works for his journal. The next was in 1876, in connection with the Centennial Exhibition of that year, when he also collected materials for a series of articles on the Pennsylvania Railroad, subsequently published in book form. In 1890 he visited New York to deliver an address on the unveiling of a statue erected to the memory of his old friend Alexander Holley. At the special request of the American Society of Mechanical Engineers, he also contributed a memoir of the late Sir Henry Bessemer, which was presented at the Niagara Falls meeting of June, 1898.

Mr. Dredge was a Member of the Institution of Mechanical Engineers and for some time served on the Council of the Society of Arts. He was also, in May, 1886, elected an honorary member of the American Society of Mechanical Engineers.

Mr. Dredge never fully recovered from the paralytic attack of 3 years ago, to which reference has been already made, but he continued to devote considerable time to the editing of *Traction and Transmission*, a publication of which he was the originator and in which he took the keenest interest, until its discontinuance in 1904. During the past 3 years he spent the greater part of his time in the south of Europe or at his home at Titchfield, in Hampshire. A few weeks before his death he returned from San Remo, where he had resided during the winter, and went to Pinner, where he died on the 15th August, 1906, aged 66. His long connection with the technical press and the prominent position which he occupied enabled him to render valuable aid in the advancement of mechanical science

during the last 40 years, and his death was widely and deeply regretted in engineering circles, where he was well known and esteemed for his ability and sterling personal qualities.

Mr. Dredge was elected a Member of this Institution on the 4th February, 1896.

JAMES RICHARD FLETCHER, born at Newcastle-on-Tyne on the 3rd October, 1849, obtained his practical training under the late Mr. Robert Morrison, at the Ouseburn Engine Works, and subsequently under the late Mr. John F. Tone. During 1871 he acted as Assistant Resident Engineer on the Newcastle and Gateshead waterworks, and in the following year he obtained the appointment of Chief Assistant in the Girder Department of the Thames Ironworks. He retained this position until 1874, when he joined the staff of the North Eastern Railway as Chief Assistant to the Resident Engineer of the Northern Division, in which capacity he designed and superintended the construction of viaducts, bridges, dock-gates and jetties; extensive doubling works; the strengthening of the high-level bridge over the Tyne, of Langley Moor viaduct, and of bridges at the Central Station, Newcastle; the erection of new superstructures at Durham, Ouseburn, and Willington viaducts, and other work. In 1899 he was appointed Engineer in charge of the Newcastle district, and held this position until his death, which occurred suddenly on the 15th April, 1906, in his fifty-seventh year. In 1901 Mr. Fletcher was elected President of the Association of Students of the Institution centred at Newcastle-on-Tyne, on which occasion he delivered an address on the development of the railway system in Northumberland and Durham. He also contributed in 1899 a Paper on "Standard Load-Gauges on Railways"¹ to the Proceedings of the Institution.

Mr. Fletcher was elected an Associate of the Institution on the 2nd February, 1875, was subsequently placed in the class of Associate Members, and was transferred to the class of Members on the 17th January, 1899.

WILLIAM HENRY GREENWOOD, born at Manchester on the 25th March, 1846, received his scientific training at the Owens College, Manchester, and at the Royal School of Mines and University College,

¹ Minutes of Proceedings Inst. C.E., vol. cxliv, p. 215.