

OBITUARY.

JAMES MANSERGH, F.R.S., Past-President of the Institution of Civil Engineers, died at his residence in Fitzjohn's Avenue, Hampstead, on the 15th June, 1905, after an illness of many weeks' duration. The second son of Mr. John Burkit Mansergh, he was born at Lancaster on the 29th April, 1834, and was educated at Harmony Hall, Hampshire, where the late Henry Fawcett, afterwards Postmaster-General, entered on the same day. To one of the masters, John Tyndall, young Mansergh owed his first impetus towards engineering. In 1849 the subject of this notice was apprenticed to Messrs. H. McKie and Lawson, engineers and surveyors, of Lancaster, where he gained a varied experience which afterwards stood him in good stead; and on attaining his majority he went to Brazil as engineer to Mr. E. Price, contractor for the Dom Pedro II. railway from Rio de Janeiro to the interior. Returning to England in 1859, Mr. Mansergh joined his old master, Mr. McKie, at Carlisle, doing general engineering work and laying out the first sewage-farm in England. Subsequently Mr. Mansergh again turned his attention to railway-work, and from 1862 to 1865 he was contractor's agent for Messrs. John Watson and Company, being engaged first on the Mid-Wales, and then on the Llandilo and Carmarthen, railway, in the latter case undertaking practically all the usual work of a railway-engineer. At the beginning of 1866 he entered into partnership with his brother-in-law, Mr. John Lawson, at Westminster, his first work being the laying out of a gravitation scheme of water-supply for Carlisle. Before Mr. Lawson's death in 1873, the partners designed and carried out, wholly or in part, sewerage, waterworks and drainage systems for numerous places in the provinces and abroad. They were associated in 1870-1 with Mr. (afterwards Sir) Robert Rawlinson in reporting for the Corporation of Birmingham upon the water-supply for that town, when Mr. Mansergh suggested the scheme adopted more than 20 years later for utilizing the valleys of the

Elan and Claerwen, with which he had become acquainted while working on the Mid-Wales railway 8 years before.

After Mr. Lawson's death, Mr. Mansergh designed and constructed sewerage-works at Southport, St. Albans, Burton-on-Trent, Ramsay, Isle of Man, Waltham, Sherborne, and other places. He was in constant request in connection with Parliamentary work, and in 1876 was engaged on behalf of the Lancaster and the Stockton and Middlesbrough Water Bills, both of which were sanctioned, the latter after a struggle of 42 days in both Houses of Parliament. The Stockton and Middlesbrough—now Tees Valley—Water Board was the first to secure the passing of an Act for compulsory purchase. Mr. Mansergh afterwards carried out both schemes, the Stockton and Middlesbrough works being still under construction at the time of his death. In this case the rainfall on 30,000 acres of the higher watershed of the River Tees was utilized, there being 40 miles of gravitation conduit.

In 1878 Mr. Mansergh prepared by special request a scheme for the sewerage of the lower Thames Valley drainage-district, comprising twenty separate local authorities and an area of 28,215 acres. He was awarded one of three premiums, and, the accepted scheme being finally rejected, was engaged with Mr. J. C. Melliss in 1883 to devise another, which was approved by the Local Government Board but defeated in Parliament. In 1879 Mr. Mansergh acted for the Thames Conservators in their arbitration with the Metropolitan Board of Works on the question of the obstruction to navigation caused by mudbanks in the Thames near the two sewage-outfalls, and 4 years later was one of the chief witnesses before Lord Bramwell's Commission on metropolitan sewage-discharge. At the invitation of the Commission he suggested in principle, as a remedial measure, the mode of treatment since adopted.

One of the most important pieces of work undertaken by Mr. Mansergh was that of advising the Government of Victoria upon the sewerage of Melbourne and its environs, an area of 133 square miles. Mr. Mansergh went to the colony in 1889, and spent 8 weeks in investigation. The complete scheme which he finally drew up was the largest of its kind ever designed, the estimated cost being £5,816,500. While in Melbourne he advised the Premier very fully upon the draft Metropolitan Board Bill, which provided for the incorporation of the districts of twenty-three local authorities within the city of Melbourne—a measure which ultimately became law.

It is, however, in connection with the Birmingham water

scheme that Mr. Mansergh's name will be best remembered. In 1890 he was again consulted by the Corporation of Birmingham, and finally reported once more in favour of the Elan and Claerwen scheme, the value of which had been impressed upon him in early days. He utilized completely a watershed area of 71 square miles, and the rainfall upon it, by providing six storage reservoirs with stone dams, varying from 98 feet to 128 feet in height, and containing in all 17,614 million gallons. This area suffices to provide 27 million gallons per day as compensation to the River Elan, and 75 millions for the supply of Birmingham and the towns adjacent to the aqueduct. The water is conveyed by a conduit having $13\frac{1}{2}$ miles of tunnel, 23 miles of cut and cover, and 37 miles of iron or steel pipes crossing valleys, with service-reservoirs, filter-beds, and many important accessory works. His Parliamentary estimate for this scheme was £5,851,000. On the 21st July, 1904, the King and Queen went to Radnorshire and inaugurated the supply, Mr. Mansergh conducting their Majesties over the works in the Elan valley, and explaining the details and general features of the scheme.

In the last decade of his strenuous life Mr. Mansergh carried out twelve more schemes of sewerage and sewage-disposal, including those for Coventry, Derby, Exmouth and Plymouth, and twenty works of water-supply, including those for Carlisle, Stockport, and Tynemouth, also preparing reports on sewerage and water-supply projects for a large number of places in this country and abroad. His services were in demand all the world over. In 1895 he reported to the municipality of Toronto on a scheme for obtaining water from the drainage-area of Lake Simcoe, 50 miles from the city, and in the same year he investigated the sanitary conditions of Colombo, recommending a sewerage scheme costing £700,000. It is impossible to particularize all the works that Mr. Mansergh undertook, but it may be stated that he acted for no fewer than 360 municipalities, local bodies, etc.; that he prepared upwards of 250 reports on sewerage and waterworks alone, to say nothing of reports on a variety of subjects connected with sanitary engineering; and that he gave expert evidence at some 300 public inquiries. He found time, indeed, to attend between sixty and seventy parliamentary inquiries between 1892 and his last illness, and so brought up the sum total of his appearances before committees of both Houses to upwards of 600. He supported the Local Government Board case in the London Water Transfer Bill, 1902, and appeared as a witness before the Court of Arbitration with regard to purchase.

Mr. Mansergh's great knowledge of water-supply schemes had previously led to his being appointed a member of the Royal Commission on the Metropolitan Water Supply, presided over by Lord Balfour of Burleigh in 1892-3.

Naturally, Mr. Mansergh was much too occupied with professional work to attempt much writing. He lectured, however, from time to time at the School of Military Engineering, Chatham, on prospecting for water and on well-sinking and boring, and before the Sanitary Institute of Great Britain, the Carpenters' Company, and the Royal Institution. Mr. Mansergh spoke on "The Law and Allocation of Underground Water" at the Engineering Conference in 1897, and as President of the Institution of Civil Engineers he presided over the Congress which met in 1901 at Glasgow. He was awarded the Telford medal and premium for the Paper presented to the Institution in 1882 on "The Lancaster Waterworks Extension,"¹ and on taking the Presidential chair he chose as the subject for his Address the history of water engineering. His lectures and Papers embodied wide research, and will always be of interest and value to those concerned with the special branches of engineering to which his energies were chiefly devoted.

In March, 1903, Mr. Mansergh was made an honorary freeman of his native town, Lancaster. In acknowledging the compliment, he incidentally said, "I cannot take to myself all the credit that has been given me. My success has been mainly due to the opportunities I have had. I was brought up in a God-fearing household—one that would nowadays be considered ultra-Puritanical—and its influence upon my life has never been lost The only credit due to me is that I have worked hard and steadily, and have tried to do everything honestly and straightforwardly."

Mr. Mansergh became a member of the Institution of Mechanical Engineers in 1875, and was elected a Member of Council in 1902. He was elected a Fellow of the Royal Society in 1901. At the time of his death he was on the Commission of the Peace for Radnorshire, of which county he was Sheriff in 1901. Mr. Mansergh was twice married, and by his first wife—the daughter of the late Mr. Robert Lawson—had a family of two sons and two daughters. The sons adopted their father's profession, and have been actively connected with him in his later work.

He was elected an Associate of the Institution of Civil Engineers

¹ Minutes of Proceedings Inst. C.E., vol. lxviii. p. 253.

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on the 5th April, 1859, and was transferred to the class of Members on the 9th December, 1873. He became a Member of Council in 1885, Vice-President in 1895, and was elected President in 1900, in succession to Sir Douglas Fox.

At a meeting of the Council held on the 23rd June, 1905, the following resolution was unanimously adopted:—"That the Council have learned with great regret the death of their esteemed and honoured Past-President, Mr. James Mansergh, F.R.S., and desire to convey to the members of his family an expression of deep sympathy with them in their bereavement."

GABRIEL JAMES MORRISON, born in 1840, studied at Glasgow University under Professor Rankine and Sir William Thomson, whom he subsequently assisted in Newfoundland on the laying of the first Atlantic cable in 1858. After serving a pupillage to Messrs. Robson, Forman and McCall, he left Glasgow in 1863, and joined the staff of Sir James Brunlees, with whom he remained 11 years, acting for a time as his Principal Assistant. During that period he was engaged as Resident Engineer on the Cleveland Railway, the Lynn Dock and Railway, the Clifton Extension Railway, and other important works in this country and abroad. On leaving the service of Sir James Brunlees he commenced private practice in Westminster, but shortly afterwards accepted an offer to proceed to China as Engineer in charge of the Shanghai-Woosung line, the first railway constructed in that country. The road was successfully laid, but was afterwards destroyed by the Chinese. This discouraging ending to his first work in China did not daunt Mr. Morrison, who always cherished the hope that he would see the line relaid, a desire which was gratified by his association in 1902 with Sir John Wolfe Barry and Mr. A. J. Barry as Consulting Engineers for the Shanghai-Nanking Railway, the successor of the early line.

In 1879 Mr. Morrison started independent practice in Shanghai, where, by his indomitable energy and ability, he soon formed an extensive connection. Later he entered into partnership with Mr. F. M. Gratton, under the style of Morrison and Gratton, the firm being connected with many of the most important works carried out in Shanghai and other places in China. Mr. Morrison's energies were chiefly devoted to the furtherance of railway enter-