

ROBERT HANDCOCK was a son of the Rev. Robert Handcock, a clergyman of the Church of Ireland, and cousin of Lord Castlemaine. He served his pupilage to Mr. W. R. Le Fanu, M. Inst. C.E., and was subsequently engaged as Resident Engineer for that gentleman on the Killarney Junction Railway, now part of the Great Southern and Western system. The long tunnel at Cork, forming part of this undertaking, was also under Mr. Handcock's supervision as Resident Engineer. In 1853 Mr. Handcock was appointed an Assistant-Engineer on the Bombay, Baroda, and Central India Railway, and was in due time promoted to the charge of a district on that line. In 1858 he left India for New South Wales, in which colony he spent the remainder of his life. Being of independent fortune he was free to regard his profession as a pleasant occupation rather than as a means of existence; but he did good work in the Australian Colonies in the direction of water-supply, the study of hydraulics having for him, in common with many of the most highly-gifted engineers, a peculiar fascination. Mr. Handcock was engaged on the survey for the Sydney water-supply in 1868, and in August of the following year was appointed a "Licensed Surveyor" of New South Wales, and employed under Mr. C. F. Adams, Surveyor-General, until April, 1876. At the latter date he was removed to the Staff and served in that capacity until his death, on the 13th of February, 1885. His excellent survey of Port Hacking first brought him under the notice of the Surveyor-General, and the plan he made to accompany Mr. W. Clark's report on the Sydney water-supply is still a standard one in the department.

Mr. Handcock was elected a Member of this Institution on the 1st of March, 1876.

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JOHN TOWLERTON LEATHER, the eldest son of James Leather, colliery-proprietor of Beeston Park, Yorkshire, was born on the 30th of August, 1804. He served his articles with his uncle, George Leather, the Engineer of the Aire and Calder Navigation, of Goole Docks, and of other works, and entered on the practice of his profession at Sheffield in 1829.

In 1833 Mr. Leather was appointed Engineer of the Sheffield Waterworks, and in that capacity carried out the large impounding-reservoirs at Redmire's, and the distributing-reservoirs at Croke's Moore, near Sheffield. During the progress of those works, Mr. John Fowler, Past-President Inst. C.E., became his pupil. In

1839 Mr. Leather, whilst retaining the appointment of Consulting Engineer to the Sheffield Waterworks, gave up the regular practice of his profession and commenced business as a contractor, in partnership with Mr. Waring, the father of the members of the present well-known firm of Waring Brothers, their first joint undertaking being a portion of the Midland Railway at Chesterfield, of which Mr. George Stephenson, then residing at Tapton House, was the Engineer. Subsequently those gentlemen executed the Chester and Crewe section of the London and North-Western system.

The partnership with Mr. Waring having been dissolved, Mr. Leather then undertook on his own account the Tadcaster and York Railway, which was abandoned by the Company when about half completed, and from 1847 to 1850 he constructed the Erewash Valley line of the Midland system. In 1854 and 1855 Mr. Leather was engaged in carrying out the River Nene improvement-works between Wisbech and Peterborough, under Mr. James Meadows Rendel, Past-President Inst. C.E., as engineer: these works, which were estimated to cost £120,000, were abandoned for want of funds in 1855. About this time, and under the same engineer, Mr. Leather successfully put in the foundations of the Suspension Bridge at Inverness, under very difficult circumstances, and after the failure of two other contractors to carry out the work.

Sir John Hawkshaw having been called upon to grapple with the disastrous inundation of the Middle Level, which occurred in 1862, secured the aid of Mr. Leather and his staff, and the work of constructing the dam and siphons, fully described in Sir John Hawkshaw's Paper,<sup>1</sup> was energetically and successfully carried through. The emergency both of this work and of that of the Inverness Bridge rendered it impracticable to enter into any contracts, and the fact that they were entrusted to Mr. Leather, by their respective engineers under these circumstances, is a striking testimony, therefore, to the confidence reposed both in his skill, his energy, and his integrity.

But Mr. Leather's name and reputation will be chiefly associated with the three great national undertakings, for two of which, the Portland Breakwater and the Sea-Forts at Spithead, he was the sole contractor; in the third, the extension of H. M. Dockyard at Portsmouth, he was associated with the late Mr. George Smith, of Pimlico.

The construction of the Portland Breakwater, for which some

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<sup>1</sup> Minutes of Proceedings Inst. C.E. vol. xxii. p. 497.

preliminary works had already been executed, was entrusted to Mr. Leather in 1849, Mr. James Meadows Rendel, Past-President Inst. C.E., being the Engineer-in-Chief, and Mr. (now Sir John) Coode, Vice-President, the Resident-Engineer, until the death of the former, in 1856, when the works were completed under the sole charge of Sir John Coode. An undertaking of this magnitude necessarily encountered many difficulties from the elements, but the skill and prudence with which they were met, and the efficiency of the appliances provided for the purpose, were the means of preventing all very serious accidents but one or two in the earlier stages of the work.

In 1861 Mr. Leather entered into the contract with the War Office, under Sir John Hawkshaw as engineer, for the construction of the foundations of the Sea-Forts at Spithead, Simultaneously with this contract he built the Gilkicker and St. Helen Forts, directly under the supervision of the Royal Engineer Department; and subsequently the superstructures of the Spithead Forts, also under Royal Engineer supervision. This contract was completed in 1872. In 1867 Mr. Leather and Mr. George Smith, entered upon the work of extending the Portsmouth Dockyard, an undertaking involving the expenditure of over £2,000,000 of public money. On account of the depth of mud and other conditions of the site, the cofferdams required were necessarily of a very expensive and substantial character; these, however, and every other appliance requisite for the efficient execution of the work, were provided with a liberality and completeness which has rarely been equalled, and which made an inspection of these works during the course of their execution one of the most noticeable engineering features of the period, and attracted numerous visits from engineers and other scientific persons, both English and foreign. This work and the appliances employed have been described in Papers by Mr. C. Colson, Assoc. M. Inst. C.E., of the Dockyard Engineers Staff, and Mr. C. H. Meyer, Assoc. M. Inst. C.E., who assisted the contractors.<sup>1</sup>

On the completion of this contract, about the year 1877, Mr. Leather withdrew from active business life, and occupied himself with local affairs and in the management and improvement of his estates in Yorkshire and Northumberland, of which latter county he was a magistrate and deputy-lieutenant, and for which he served as High Sheriff in 1875. Mr. Leather, who was twice married, died at Leventhorpe Hall, near Leeds, on the 6th of June, 1885.

<sup>1</sup> Minutes of Proceedings Inst. C.E. vol. lxiv. p. 118.

In the course of his career as a contractor, Mr. Leather's position and reputation naturally led to his being made many offers for the carrying out of large works abroad, but these proposals never got beyond the initiatory stage. His advice was frequently sought on engineering and other kindred questions, and his well-known prudence and tried experience enabled him to be of service in this way on many occasions. The confidence reposed by Mr. Leather in his staff, and the freedom with which they were thus enabled to grapple with the many sudden emergencies inseparable from sea-works, were also important factors of his success in these undertakings.

Personally Mr. Leather was extremely courteous and fair-minded, and he was also one of the most modest and unostentatious of men, shrinking from any kind of publicity in connection even with such large undertakings as fell to his lot to carry through; combined with this was a strong love for thoroughness and for work of the best character, which is clearly stamped upon the enterprises by which his name will be long remembered.

Mr. Leather was one of the oldest Members of the Institution, having been elected on the 23rd of February, 1836, and having all but completed a membership of half a century.

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FRANCIS MATHEW<sup>1</sup> was the son of Mr. Francis James Mathew of Rock View House, Co. Tipperary, and nephew of the celebrated Father Mathew. He commenced his career in 1847 as a pupil under Mr. Joseph Burke, senior District Engineer, on the establishment of Sir John Macneill, M. Inst. C.E. After four years with Mr. Burke, during which time he was engaged in the construction of the Dundalk and Enniskillen and the Waterford and Kilkenny Railways, Mr. Mathew became an assistant engineer on the establishment of Mr. William Dargan, the well-known railway-contractor. He remained in this service for six years, during which time he held the position of Engineer on the Limerick and Foynes, and the Limerick and Ennis Railways, and was subsequently for two years and a half Manager-in-Chief of the Cork Tunnel-works of the Great Southern and Western Railway. These works he brought to a successful completion in 1857. In January 1858 he left England for India, under a

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<sup>1</sup> This memoir is mainly compiled from a notice in the *Times of India* for October 23, 1885.