OBITUARY.

SIR EDWARD LEADER WILLIAMS, designer and formerly Chief Engineer of the Manchester Ship Canal, died at his residence at Altrincham, Cheshire, on the 1st January, 1910, at the age of 82.

Born at Worcester on the 28th April, 1828, he was apprenticed at an early age to his father, Mr. E. Leader Williams,[1] who was then Chief Engineer to the Severn Navigation Commissioners. He was then successively engaged as Assistant Engineer on the Lincolnshire section of the Great Northern Railway, Resident Engineer on the Shoreham Harbour works, and Engineer to the contractors for the Admiralty Pier at Dover.

In 1856 he was appointed Engineer to the River Weaver Trust, and whilst occupying that position carried out many improvements of the Weaver Navigation, and was responsible for the introduction of the well-known boat-lift at Anderton. This structure, the original design and erection of which was described in the Proceedings,[2] worked successfully for many years, and has recently been converted from hydraulic to electrical operation.[3] In 1872, Mr. Leader Williams became Engineer to the Bridgewater Navigation Company, and during his tenure of this appointment, amongst other works of improvement, he enlarged the locks at Runcorn, and introduced steam-propulsion on the canal, building for that purpose a nearly vertical wall for a distance of nearly 30 miles along one side of the waterway. He also experimented with wire-rope traction, but found the curves of the canal rendered it unsuitable for this system.

He next devoted his attention to the problem of devising such improvement of the Mersey and Irwell navigation as would give Manchester access to the sea, his successful solution of which was destined to prove the outstanding feature of his life's work. To

[1] Minutes of Proceedings Inst. C.E., vol. lvii, p. 315.
[2] *Ibid*, vol. xlv, p. 107.
[3] *Ibid*, *ante*, p. 239.

the Provisional Committee appointed in 1882, schemes for a ship-canal were submitted by Mr. H. H. Fulton and the subject of this memoir. Mr. Fulton's scheme provided for a tide-level canal, whilst that of Mr. Leader Williams utilized the Mersey channel as far as was considered practicable, completing the route to Manchester by means of a lock canal. On the recommendation of the late Mr. James Abernethy, Past-President, the latter scheme was adopted and Mr. Leader Williams was appointed Chief Engineer. After many serious and unforeseen difficulties had been overcome, the undertaking was successfully completed and the canal was opened to sea-borne traffic in 1894. In that year a knighthood was conferred upon Mr. Leader Williams. The works are fully described in four Papers[1] which were contributed to the Proceedings of The Institution, two of them from the pen of the Chief Engineer. After the opening of the ship-canal, Sir Leader Williams continued to act as Consulting Engineer, but latterly he had largely given up active practice.

In private life, he was one of the homeliest and simplest of men, always loth to speak of his own achievements. The eldest of eleven children, of whom another is Mr. B. W. Leader, R.A., he early displayed those qualities of resource and self-reliance which distinguished his after career.

Sir Leader Williams was elected a Member of The Institution on the 7th February, 1860. Between 1895 and 1907 he served on the Council, being for the last two years of that period a Vice-President of The Institution.

WILLIAM JOHN CUDWORTH, late Chief Engineer of the southern division of the North Eastern Railway, died at his residence, Butts Close, York, on the 31st December, 1909, in his sixty-first year. The son of the late Mr. William Cudworth,[2] Chief Engineer of the Stockton and Darlington Railway, the subject of this notice was born at Darlington in 1848, and, as a member of the Society of Friends, received his education partly at Stramongate School, Kendal, and partly at Bootham, York. In 1865 he entered the service of the Stockton and Darlington Railway Company—a section of the North Eastern Railway—as

[1] Minutes of Proceedings Inst. C.E., vol. cxxxi, pp. 14, 31

[2] *Ibid*, vol. clxvi, p. 381.