

Mr. Robert Bruce Bell,¹ elaborated in 1875 a scheme for supplying the city of Turin with water. He also devoted much time, in conjunction with Mr. Abernethy,² Past-President, in resuscitating the scheme for new docks on the Thames at Dagenham.

Early in 1860 Mr. Rumball married Jessie, youngest daughter of the late Mr. D. Finlayson, of the firm of Messrs. Finlayson, Bousfield and Co. of Johnstone, N.B., flax spinners. He was elected an Associate on the 14th April, 1863, and was transferred to the class of Members on the 17th December, 1866. In 1878 and 1879 he rendered service to the Institution by auditing the accounts.

DAVID LEONARD BARNES³ was born at Smithfield, Rhode Island, near Providence, U.S., on the 23rd August, 1858. When he was only about eleven his father died, and young Barnes soon had to exercise self-reliance and judgment. At fifteen he began work with a civil engineer, and was occupied two or three years in surveys. In 1876 he entered Brown University, and spent three years there and at the Massachusetts Institute of Technology, as a special student, doing engineering work in vacations. In 1879 he began work in locomotive shops, and during the following eight years served in various capacities in the Hinckley, the Rome and the Rhode Island Works. He eventually became Chief Draughtsman and Mechanical Engineer at the Rhode Island Works. In 1887 he began to practise as a consulting engineer, doing work of some importance for various clients, and for the last eight years he maintained an office as consulting engineer in Chicago, with a New York connection, and was also on the staff of the *Railroad Gazette*, not merely as a writer, but with editorial responsibility, and largely influenced the conduct of that paper in mechanical matters, and especially in locomotive engineering.

Mr. Barnes' work as a consulting engineer covered the design, testing, and inspection of railroad rolling stock. As the Chicago and South Side Rapid Transit Railroad (Alley Elevated) neared completion, he was entrusted with the general supervision of the design and construction of its rolling equipment, signalling, lighting and shop plant. His most important recent work was as Consulting Engineer for the Baldwin Locomotive Works and the Westinghouse Electric and Manufacturing Company in designing

¹ Minutes of Proceedings Inst. C.E., vol. lxxv. p. 293.

² *Ibid.*, vol. cxxiv. p. 402.

³ This account has been abridged from a notice which appeared in the *Railroad Gazette*, New York, 25 December, 1896.

a set of standard electric locomotives. He threw himself into this with enthusiasm, and brought to bear upon it an intimate knowledge of the requirements of railroad work, a set of designs being produced, remarkable for simplicity and adaptability to the actual work of hauling trains. Mr. Barnes did not claim that he alone was responsible for these designs; he was the last man to claim more than his due, or to belittle the part which others had in his work.

Mr. Barnes died in New York on the 15th December, 1896. His activity during the last eight years was prodigious; probably it killed him. He wrote much, not only unsigned articles in the *Railroad Gazette*, but over his own name in the transactions of the various technical societies to which he belonged.¹ He was fond of writing, and always had two or three articles and papers on hand in various stages of preparation. But he had little enjoyment in mere composition. Writing was to him only a means of conveying thought, and had he lived he would have made a reputation for clear and energetic expression. His numerous papers and reports on locomotive engineering, on car-construction, and on electricity as a motive power for railroad working, form a body of scientific literature of permanent value, not only in what he said, but in what he suggested. The only books which bear his name are the revised edition of "Compound Locomotives" by Arthur T. Woods, and an excellent treatise on "Electric Locomotives."

Physically and mentally Mr. Barnes was a man of unusual strength and energy; no amount of work discouraged him, and being quick and systematic he accomplished much. He was a natural mathematician, had strong powers of analysis, reasoning and invention, and loved to use his faculties. One of the most striking qualities of his mind was its lucidity. He was enthusiastic, candid and courageous, and, being human, was sometimes wrong, but he was always stimulating and suggestive. And he never stuck to an error because it was his; he had the truly scientific love of truth. He had great poise; excitement only steadied him, and even when he was angry, which was seldom, he was temperate in speech and conduct. His bright spirits and his sweetness of temper and manner, endeared him to old and young, and he has no more sincere mourners than the little children who knew him.

Mr. Barnes was elected an Associate Member on the 3rd March, 1896.

¹ See Transactions of the American Society of Civil Engineers, vol. xxix. p. 385, and Transactions of the American Society of Mechanical Engineers, vol. xvi. p. 249.
