

will yet be remembered as a singularly upright and sincere man, perhaps too honest in his convictions, and in his mode of expressing them, for the majority of those with whom he came in contact.

His principal contributions to literature were "The Gate of the Pacific," in which he advocates his most cherished project—one to which, for more than twenty years, he devoted most of his time and study—"Dottings by the Roadside," "An Earnest Appeal on behalf of the Franklin Expedition," "The Negro of Jamaica," "The Eastern Question," "The Political Situation Abroad."

Admiral Pim was elected an Associate of the Institution on the 9th of April, 1861. He died at Deal on the 30th of October, 1886.

JOHN MILROY died on the 9th of October, 1886, at the age of eighty years. He was one of the remaining links between the present day and the early period of railway construction, in which the late Mr. Thomas Brassey played a prominent part. Mr. Milroy was associated with that eminent contractor in railway work so far back as in the construction of the line between Glasgow and Greenock, now belonging to the Caledonian Railway. Mr. Milroy subsequently acted as agent for Mr. Brassey and for Messrs. Brassey and Mackenzie in the construction of lines of great extent on the Continent, the first of them being that between Paris and Rouen, of which Mr. Joseph Locke, Past-President Inst. C.E., was Engineer-in-Chief. Mr. Milroy was also engaged in a similar capacity on the Rouen and Havre, the Nantes and Caen, and the Caen and Cherbourg, railways. A few years later he likewise represented Mr. Brassey in the construction of a length of nearly 80 miles of the Great Northern Railway; and there were various other railway undertakings with which he was connected, not only in this country but also in France and Italy. Indeed, a considerable portion of his life was spent on the Continent, where he became exceedingly well known and greatly esteemed on account of his personal character.

From 1865 to 1877, Mr. Milroy represented Messrs. Brassey & Co., the contractors for the Glasgow City Union Railway, and the whole of this work, the cost of constructing which amounted to about £700,000, was carried out under his direction.

For the important bridge over the River Clyde in connection with this railway, it was necessary to sink several cylinders through a bed of fine sand to a depth of about 90 feet below high-

water; and this first directed his attention to the subject of cylinder foundations. The engineers had contemplated using compressed air and excavating the material in the cylinders by hand; but Mr. Milroy conceived the idea of sinking them by an excavator which could be used without taking out the water, and he proposed to try such an apparatus. This led to the first design of his patent excavator, and after a course of experiments, it was gradually adapted practically to the form in which it has since been used. The cylinders of the bridge were all successfully sunk, and the work established the great utility of the excavator for cylinder-sinking in loose and sandy materials. Mr. Milroy contributed to the Institution a Paper describing this work.¹

In the year 1870 he was consulted by the Engineers of the Clyde Trustees as to their proposals for building quay walls on cylinder foundations, and he suggested the adoption of brick cylinders, which was finally decided on; and in conjunction with Mr. Brassey he undertook contracts for the Plantation and Mavisbank Quays. In the former of these works the superstructure was built on foundation piers which were formed of successive rings of brickwork. In the construction of Mavisbank Quay, a marked improvement was made in the character of the subaqueous pier foundations, which were formed of concrete, the piers being most securely bound together. The Milroy excavator was here used to excellent purpose, enabling the piers to sink to depths of 50 feet to 60 feet, or 70 feet. These works are fully described in a Paper presented to the Institution by Mr. Milroy in 1873.²

The various works which Mr. Milroy carried out in the Glasgow district, including those for which he was sole contractor, cost nearly £1,500,000. After retiring from active life, he passed his remaining years on the estate of Torsonce, Midlothian, which he acquired in the year 1879, and which he occupied himself in improving and beautifying. He had been in failing health for some months previous to his death.

Apart from his special knowledge of subaqueous foundations, Mr. Milroy possessed a very sound judgment as to all kinds of contractor's work. He had great insight into the cost, and most suitable methods of carrying out engineering operations, and his wide and varied experience, combined with a complete knowledge of practical details, enabled him to detect at a glance any

¹ Minutes of Proceedings Inst. C.E. vol. xxviii. p. 339.

² *Ibid.* vol. xxxv. p. 186.

symptom of waste or of unnecessary expense. His method of conducting work was honourable, straightforward, and judicious; his manner courteous and conciliatory, which, combined with great shrewdness and tact, enabled him frequently to smoothe over difficulties that with less judicious handling might have occasioned serious disputes and complications.

Mr. Milroy was elected an Associate of the Institution on the 6th of May, 1868. He was also a Fellow of the Royal Society of Edinburgh, and, though of a retiring disposition, took great interest in all that tended to promote the welfare of his fellow-men.

* * The following deaths have occurred since the 31st of December last, in addition to those included in the foregoing notices :—

Members.

BOWER, JOHN.	ORMSBY, ARTHUR SYDNEY.
BRADFORD, HUGH MELLER.	PHILLIPS, JOHN ARTHUR, F.R.S.
COOKE, JAMES SAMUEL.	TARBOTTON, MARRIOTT OGLE.
DENNY, WILLIAM.	WHITWORTH, Sir JOSEPH, Bart., D.C.L.,
EADS, JAMES BUCHANAN.	F.R.S.
LEATHER, JOHN WIGNALL.	

Associate Members.

ADDENBROOKE, EDWIN.	ROSS, LEATHOM EARLE.
BROOK, THOMAS.	WAKE, CHARLES BALDWIN.
FAWCUS, ERNEST AUGUSTUS.	WHITTINGTON, WILLIAM.

Associates.

BOLTON, Colonel Sir FRANCIS JOHN.	HUNTER, JAMES.
	RAVENHILL, RICHARD.

Information respecting the careers and leading characteristics of any of the above is solicited, to aid in the preparation of future Obituary Notices.—SEC. INST. C.E. March 25, 1887.