

the best means of recovery he became a paying patient at Guy's Hospital, where he died on the 17th of August, 1893.

Mr. Evelegh was elected an Associate Member of the Institution on the 13th of January, 1885.

HODGSON MONTEITH LAYARD JONES, eldest son of the late Mr. John Hodgson Jones,¹ was born on the 31st of October, 1843. At the early age of fourteen he was articled to his father for six years, after which he was placed in charge in 1864 of the extension of the gasworks at Malta. From June, 1865, to February, 1866, he was engaged at Glasgow and at Paisley inspecting work for shipment for the Continental Gas and Water Company and for the Malta and Mediterranean Gas Company. In the following April he undertook for the latter company the control of the erection of the Trapani Gasworks in Sicily, on the completion of which he constructed similar works at Marsala.

Returning to England in June, 1867, he was engaged for a time inspecting for the Continental Union Gas Company, but in September, 1869, he commenced to practise on his own account in London. Finding competition very keen he wisely accepted in 1874 an appointment with the Oporto Gas Company, which he held for ten years. On the death of his brother, William,² in 1884 he became engineer and manager of the Popolo station at Rome of the Anglo-Romano Gas Company. He performed with credit the duties of that post until his death, which took place suddenly on the 27th of August, 1893, the cause being diabetes and symptoms of paralysis of the heart.

Mr. Jones' exceptionally kind and frank nature endeared him to a large number of friends. He was elected an Associate of the Institution on the 2nd of May, 1871, and was subsequently placed in the class of Associate Member.

RICHARD CAIL was born at Gateshead-on-Tyne on the 11th of May, 1812. After being educated at Mr. Bruce's school at Newcastle, he was—in accordance with the wish of his father, who thought that all youths should learn a trade—bound apprentice for seven years to Mr. Joseph Grey, builder, of that town. His master was a strict man of business and every day he

¹ Minutes of Proceedings Inst. C.E., vol. cxii. p. 353.

² *Ibid*, vol. lxxxii. p. 385.

was absent from work had to be made up before his indentures were delivered to him. On the expiration of his apprenticeship he commenced work on his own account in 1832 as a builder. He soon began to undertake considerable contracts and, being exempt as a Freeman of the town from the payment of all dues on cargoes, was able to make large profits on the timber, slates and Aberdeen flags which he imported in rapidly increasing quantities.

As he became better known, Mr. Cail obtained several important railway contracts, among which may be mentioned the construction in 1843 of the Sherburn and Shincliffe viaducts on the Newcastle and Darlington Junction Railway; the extension to Tynemouth of the Newcastle and North Shields Railway in 1845-6; the construction of the Richmond and Boroughbridge branches of the Great North of England Railway and the Warkworth branch (now the Amble branch) of the Newcastle and Berwick Railway in 1846-8; and the extension to Sleekburn of the Blyth and Tyne Railway in 1849-50. All these lines were eventually merged in the North Eastern Railway, for which company he constructed in 1853-6 the line from Leamside to Durham and Bishop Auckland, and subsequently the Dearness Valley Railway, the Rosedale branch, the Nidd Valley branch, and the connecting line between Nunthorpe Junction and Ingleby (now Battersby) Junction. He also constructed for the Whittle Dean Water Company (now the Newcastle and Gateshead Water Company) the Great Northern reservoir at Whittle Dean and the aqueduct tunnel through the mountain limestone ridge at Ryal.

In 1862 Mr. Cail gave up work as a contractor and became a member of the Walker Chemical Company, of which he acted as managing partner for several years. Subsequently he became interested in the sheet-iron works at Redheugh and was also chairman of the Redheugh Bridge Company. In 1876 he reported to the Tyne Improvement Commissioners on the Tyne piers, of which he proposed some alteration in the future mode of construction.¹ He subsequently became a prominent member of that Commission. Mr. Cail was for many years a member of the Town Council of Newcastle and twice served the office of mayor. He took a keen and practical interest in all municipal matters, especially as to the question of the local water-supply. For nearly twenty years he was on the Commission of the Peace for the city and county of Newcastle and was also a magistrate for the county of Durham.

¹ Library Inst. C.E., Tracts folio, vol. 24.

In spite of impaired sight and increasing feebleness Mr. Cail led an active life to the last. On the 18th of October, 1893, he attended a meeting of the Newcastle Town Council, at which he presented a report on his scheme for supplying the city with water from Lake Ullswater. He became ill during the meeting, but was able to drive home and go to bed. In a few hours, however, he died painlessly, from failure of the heart's action, in the eighty-second year of his age. Mr. Cail's career is an instance of what may be achieved by energy and perseverance. He was respected for his integrity and esteemed for his public spirit.

Mr. Cail was elected an Associate of the Institution on the 7th of December, 1875.

FREDERICK RANSOME,¹ born on the 18th of June, 1818, was one who, by patient research, enriched the world's knowledge of the chemical treatment of minerals. Early in life the idea occurred to him that stone, like iron, might be melted and run into moulds, and that the myriads of little grains of sand by the sea-shore might be cemented indissolubly together. So long ago as 1848 he presented to the Institution a Paper entitled "On the Manufacture of Artificial Stone with a Silica base."² After many years of experiment, during which he made several discoveries, some of them unexpectedly, he perfected his process of manufacture, which was based on one of the most beautiful of chemical reactions. Flints were first dissolved by means of caustic alkali under high pressure, so as to form soda silicate—a kind of water glass. This viscous and tenacious substance was then rapidly mixed with a proportion of very fine and sharp silicious sand in a vessel, so as to form a soft plastic mass which could be moulded into any shape desired. The soft stone was then placed in a bath of calcium chloride solution, which was made to penetrate every pore by means of hydraulic or atmospheric pressure. When this solution came into contact with the soda silicate a double decomposition took place, the silica combining with the calcium and forming a hard solid silicate of lime, and the soda uniting with the chlorine to form sodium chloride in a small quantity. Instead, then, of the particles of sand being covered with a thin film of the liquid silicate of soda, they were covered and united together with a film of solid silicate of lime, one of the

¹ The substance of this notice is taken from "Engineering," vol. lv. p. 624.

² Minutes of Proceedings Inst. C.E., vol. vii. p. 57.