

Northern of Ireland in the year 1876. Thereupon he was appointed Engineer of the Northern Division of the amalgamation, which comprised the old Ulster system and some additional branch lines. Under Mr. Atkinson's management, improvements were effected in the permanent way, and several important works were carried out, principally the rebuilding of the bridges over the Rivers Carn and Blackwater; also various undertakings in connection with the remodelling and re-signalling of several of the large stations. Owing to ill-health, he was obliged to resign his appointment in August 1889. He enjoyed his retirement only for a few months.

Mr. Atkinson was one of the promoters, and also a director of the Electric Railway between Portrush and the Giant's Causeway, being the first electric railway in the United Kingdom. He took great interest in the construction and carrying out of the line. He was a skilful engineer, with large experience. He was also an accomplished musician, taking part in the orchestra of various concerts in Belfast, especially in connection with the Philharmonic Society. He was a good friend to those subordinate to him in his official capacity, his kind, genial, and generous disposition winning for him many friends from all ranks. He was long connected with Freemasonry, and attained to very high Degrees in the order, contributing also liberally to the various Masonic charities, and he was held in high estimation by the craft.

Mr. Atkinson was elected a Member of the Institution of Civil Engineers on the 6th of February, 1866. He died on the 13th of December, 1889.

FRANCIS ROUBILIAC CONDER, the eldest son of Josiah Conder, well known during his lifetime as a philanthropist and an author, was born a freeman of the City of London, in St. Paul's Churchyard, on 26th November, 1815, and was educated at Mill Hill School. He was articled as an engineer to Sir Charles Fox, in the early days of railway-making in England, and has left some account of his first experiences, and of his personal impressions of men like Robert Stephenson and Brunel, in a volume entitled "Personal Recollections of an Engineer." One of his earliest professional engagements in 1836 was on the Birmingham and Gloucester Railway under Robert Stephenson. Like other members of his profession, he was induced, by the rapid profits of such work, to become a contractor, and was employed by Fox, Henderson and Co., on responsible duties at Birmingham,

Pembroke Docks, and Liverpool. In 1848 he took one of the contracts of the South Wales Railway, under Mr. Brunel, the work continuing at intervals down to 1855. In 1850-51, under Fox Henderson, Mr. Conder was employed on the Cork and Bandon Line. These enterprizes brought substantial sums, and enabled him to work independently. In 1854 Mr. Conder was engaged, as a member of the firm of Conder, Goode and Co., in laying the permanent way of the Bordeaux and Bayonne Railway in France, of which work he contributed an account to the Institution.¹ Shortly after he visited Portugal, with a view to railway work, but the negotiations led to no agreement.

In 1855 Mr. Conder undertook a contract for the Brindisi Railway, and unfortunately embarked great part of his fortune in the enterprise, which was well thought of at the time, and under ordinary circumstances might have been extremely lucrative. The Neapolitan Government, under Ferdinand II., was however notorious for its ill-faith; and while the King himself professed the highest interest in pushing on the work, which led Mr. Conder on an adventurous journey through Apulia, the Government placed every obstacle in the way of the fulfilment of the contract, and finally stopped the work by Royal Decree, at the same time appropriating the caution money (£50,000) to its own uses. The various trials which followed led in every case to a verdict against the Government, but without any redress being given; and the serious losses thus entailed led to an attack of brain fever, which incapacitated Mr. Conder at a critical time, and endangered his life. These reverses, due solely to the treachery of the Neapolitan Government, were followed by political events which threw the whole of Italy into convulsions. Mr. Conder witnessed the entry of Garibaldi into Naples; the establishment of Italian unity, and the transfer of the seat of Government to Turin; having vainly endeavoured, on each apparently favourable opportunity, to urge his just claims on the new regime.

In 1864 Mr. Conder was in Turin, but although he had received support from the British Ambassador, the equity of his claims being fully admitted in various letters from the Foreign Ministers at home, he became convinced that nothing more could be done on the spot, and returned to England to take up his profession.

It is not often that a professional man, thus ruined in middle life, has been able to recover his position, and to give his children a good social opening; yet by patience and ability Mr. Conder

¹ Minutes of Proceedings Inst. C.E., vol. xvi. p. 371.

succeeded in such a task. He became Engineer for a short time to the Bombay Exhibition, and afterwards for many years made an income from literature, during which time he was much occupied in the study of questions concerning water-supply, canals, railway economies, and the purification of sewage, on all which subjects he became an authority, and thus found employment as a consulting engineer.

As early as 1872, Mr. Conder became a regular contributor to the "Edinburgh Review," a connection which continued to the last year of his life, some of his later articles attracting special notice. The subjects were very various, for, in addition to professional knowledge, he possessed a large store of Oriental antiquarian learning. Thus, side by side with articles on canals, railways, harbours, and lighthouses, he contributed Papers on Jerusalem, The Talmud, ("Edinburgh Review," July 1873), and the Monumental History of Egypt. For Mr. George Godwin he wrote every week in the "Builder"; for Mr. Greenwood, his political articles in the "St. James's Gazette" often attracted special notice; for Mr. S. C. Hall, he wrote on Art and Sculpture in the "Art Journal"; and some of his latest and most successful Papers appeared in the "Scottish Review," nearly all the work being, however, anonymous, though in "Fraser" his name became known in connection with the question of railway economies.

One of his most striking contributions to the "Edinburgh" was an article on the Panama Canal, in April 1882, long before public opinion had become instructed as to the real character of that disastrous affair. Mr. H. Reeve, editor of the "Edinburgh," writing to give permission for the authorship of this and other articles being acknowledged, says as follows:—

"He (Mr. Conder) was the first to demonstrate the impracticability of the Panama Canal on engineering grounds. He was the first to show that the carriage of heavy goods, such as coal, by rail, was a doubtful source of profit, and that the abandonment of canals was a great mistake. He wrote a powerful article on the dangerous tendency of municipalities to run into debt, and many other valuable articles."

Among the most interesting of these to engineers may be enumerated:—

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| "Edinburgh Review," | Oct. 1879, | "Civil Engineers of Great Britain." |
| " | Jan. 1880, | "British Lighthouses." |
| " | April 1881, | "River Floods in England." |
| " | Oct. 1882, | "Inland Navigation." |
| " | July 1885, | "Harbours and Docks." |
| " | April 1887, | "Railway Problems." |
| " | April 1888, | "Municipal Debts." |

The last article in 1889 was a review of the progress of railway engineering during Mr. Conder's lifetime. Since his death an article on Irrigation in Egypt has been published in the *Scottish Review*.

Mr. Conder lived to see many of his forecasts verified, and many of the causes he advocated gained. In 1882 he was employed in showing the practicability and the utility of the Manchester Ship Canal. He was consulted as to other canals, and gave evidence before the Royal Commission on the subject of developing this neglected means of transport. On the 6th of February, 1883, he became a Member of the Institution, and his Paper on "Speed on Canals" appeared in the Minutes of Proceedings of the Institution.¹ In 1884 he was consulted on the Metropolitan Water Bill, which, in accordance with his views, was thrown out by a majority of 197 to 152, on the 11th of March in that year.

Mr. Conder was the author of several volumes: "The Trinity of Italy" (a publisher's title), which gives a sketch of his Italian experiences; "Recollections of a Civil Engineer," already mentioned; "The Child's History of Jerusalem;" "The Handbook of the Bible" (Longmans, 1879), and a work of early years entitled "Elements of Catholic Philosophy."

For some fifteen years Mr. Conder paid great attention to the question of the purification and disposal of sewage, which he recognised as a question the importance of which was constantly increasing with increased density of population. His writings did much to turn attention to the question, and at length, in 1885, he discovered a simple chemical process which he patented, and which he described to the Institution of Civil Engineers of Ireland, in May 1888, and to the Royal Engineers' Institute at Chatham, in November 1887. The process was made applicable to private houses, as well as to town-drains, and has already met with considerable success.

Mr. Conder's last professional visit, shortly before his death, was connected with the adaptation of his process to the large town of Halifax. These successes, which promised rapid return to fortune, were due, not to accident, but to a minute study of all that had been attempted for many years in the treatment of sewage, both in England and abroad.

Mr. Conder died very suddenly of angina pectoris, in his study, on the 18th of December, 1889, in full possession of his intellectual powers and activity, having just passed his seventy-fourth birthday.

¹ Vol. lxxvi. p. 160.

His loss is not only mourned by a large circle of literary, professional, and private friends, by whom he was loved and admired, but will also be felt in English literature, in which he held so high a position.

HENRY JOHN FRASER, the eldest son of the late Mr. John Fraser, of Leeds, was born at Pudsey, near that town, on the 20th March, 1848. He was articled to his father (1866-1870) and on the completion of his pupilage had responsible charge of the works required in the construction of the Bradford, Ecclehill and Idle, and the Idle and Shipley Railways, and from 1874 to their completion in 1879, of the Bradford and Thornton Railways, including very heavy viaduct, tunnel, bridge and other works. He also had charge of the Halifax section of the Halifax, Thornton and Keighley Railways, including a tunnel $1\frac{1}{2}$ mile long. From July 1878 to 1880, he was engaged on the extension of the last named railway from Thornton to Keighley. During this latter period he became a partner with his father, and was also engaged in preparing the designs for the remaining works on the last-named railway, the contract for which was let in October, 1880, including viaducts, tunnels and other works of a heavy character of which he also had personal charge.

Mr. Fraser assisted in the preliminary work and the construction of the extensive system of railways from Newark to Bottesford, Bottesford to Melton, Melton to Tilton, Tilton to Leicester (over 50 miles), and the preliminary work of the Tilton to Market Harborough railways (21 miles). On the death of his father, in 1881, he was joined by his brother-in-law, Mr. W. Beswick Myers, and they, under the name of Messrs. John Fraser and Sons, completed the Thornton to Keighley and Tilton to Leicester sections of the above railways. They also carried out the preliminary work and construction of several other important connecting lines in Yorkshire, viz., the Crofton Branch and the Dewsbury Branch, and had nearly completed the construction of the line from Beeston to Batley, the Harrow and Stanmore Railway, the Halifax High Level Railways, and (in conjunction with Sir Douglas Fox) the Driffield to Market Weighton section of the Scarborough Bridlington and West Riding Junction railways. In addition to the above he and his partner were engaged on several other important railway schemes, amongst which were the Lowmoor to Dudley Hill and the extension of the Pudsey Railway.

Mr. Fraser, who became a member of the Institution on the