tions Division of the South Kensington Museum, an exhaustive catalogue[1] of which, prepared by him, was published by the Science and Art Department in 1890. He was a member of the Jury at the International Inventions Exhibition and acted as a judge for the Royal Agricultural Society in 1868 and 1870. Among his many miscellaneous inventions may be mentioned improvements in candle-making machinery adopted by Price's Candle Company; an apparatus for the recovery of lead fumes which effected great economy by securing fine particles of lead previously lost through the chimney; a sugar-cutting machine in which knives arranged in squares were employed to cut the slabs into small cube-shaped lumps; and an improved gin for removing the fibre of cotton from the seed. He frequently acted as a witness in patent and arbitration cases.

Mr. Cowper was elected an Associate of the Institution on the 13th of January, 1852, and was transferred to the class of Member on the 28th of February, 1860. In 1878 he was elected a Member of the Council, on which he continued to serve until his death. In addition to the Paper on the "Regenerative Hot-blast Stove," above referred to, he delivered before the Institution on the 17th of January, 1884, a lecture on the "Steam-Engine," which formed one of the special series of lectures on "Heat in its Mechanical Applications." He was a constant attendant at the meetings and frequently took part in discussions; shortly before his death he interested himself greatly in a Paper on the "Break-down of the R.M.S. 'Umbria,'" by Mr. Thomas Sopwith, and it was under his direction that the model of the broken shaft of that vessel, then exhibited, was prepared.

Mr. Cowper died from pneumonia, after a very brief illness, on the 9th of May, 1893, at the age of seventy-three. He may be said to have died in harness, for it was only a few weeks previously that he had taken into partnership his son, Mr. Charles E. Cowper, with a view of relieving himself from much of the strain of work which he had begun to feel.

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FRANCIS FOWLER, fifth son of the late Mr. J. K. Fowler of Aylesbury, was born on the 28th of June, 1829, and in March, 1846, was articled for three years to the late Mr. Richard Madigan, then an engineer on the London and Birmingham Railway. On

[1] Library Inst. C.E.

the expiration of his pupilage he remained with that gentleman as an assistant for about six months and afterwards was employed by the late Mr. Isaac Dodds[1] to assist in the design of locomotives and rolling-stock for the Santander and Alar Railway in Spain. In November, 1853, he proceeded to Canada, where he was appointed Resident Engineer in charge of the construction of 12 miles of the Montreal and Bytown Railway. He opened, and for a time superintended, the working of that section, but owing to financial difficulties the construction of the line was then temporarily abandoned.

Returning to England in November, 1855, Mr. Fowler was employed for a time in making designs for large river bridges for the Bombay and Baroda Railway. In September of the following year he proceeded to India to take up the appointment of District Engineer on the Umritsur Division of the Punjab Railway, 32 miles in length and including large terminal stations at Lahore and Umritsur. That division was the first portion of a railway constructed in Northern India, and upon Mr. Fowler devolved the troublesome task of training the unskilled natives in the various branches of work they had to perform. He held that post until February, 1861, when he returned to England. On the recommendation of the late Sir W. P. Andrew, then Chairman of the Punjab Railway Company, he was appointed in May, 1862, Chief Engineer to the Hindostan (Singbhoom) Copper Company and again proceeded to India. He had the entire management of the mines and works in India and the control of the expenditure of the company, in addition to which he had to open up the approaches to the mines by making roads and building bridges in a wild and inaccessible country. All these duties he carried out to the satisfaction of the directors; but after two years' arduous work and constant exposure to the climate his health broke down; he was obliged to resign his appointment and return to England.

While in India Mr. Fowler had saved some money which he was now unfortunately induced to invest in the Railway Finance Company, an undertaking established to facilitate and promote the construction of railways and other public works. For a time he acted as engineer to that company, but it soon proved to be an unprofitable enterprise, and by its failure he lost all he possessed. He then determined to abandon railway work and from that time devoted himself almost entirely to inspecting and reporting upon

[1] Minutes of Proceedings Inst. C.E., vol. lxxv. p. 308.

mining projects in various parts of the world, in some cases undertaking also the management of the mines. He was largely instrumental in exposing the worthlessness of the gold mines in the Wynaad.

After reporting on gold-fields in India, New South Wales, and South Africa, Mr. Fowler was appointed, in 1871, Engineer to the Mammoth Copperopolis Company's mines in Utah, and for the next three years resided at Salt Lake City. During that time he was also connected with the Saturn Silver Mining Company in Utah and with the Phœnix Quicksilver Mining Company in California. On leaving the service of the Mammoth Copperopolis Company he returned to England; after a time he proceeded to South America to report on Mining projects in the Andes and subsequently visited Mexico, California and Newfoundland with the same object. But the effects of an attack of jungle-fever, contracted during his first visit to India, told heavily upon him during these arduous and sometimes dangerous ventures, and occasionally he was compelled to abandon work and rest for a time. These periods of enforced idleness were a serious drain upon his resources, but at length a prospect opened up which promised great things. During one of his visits to the South of France he had reported very favourably on a valuable manganese mine, and was about to proceed to that country to take charge of its working when he was unfortunately struck down by a severe attack of dysentery, which ended fatally on the 9th of February, 1893.

Little more than an indication of Mr. Fowler's eventful career has been here given, but in the absence of any private record it has not been possible to obtain particulars of the numerous ventures in which he was interested during the last thirty years of his life. He was elected a Member of the Institution on the 6th of February, 1866.

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HENRY GILL, born at Rye in Sussex on the 10th of March, 1824, was educated at private schools and subsequently at the defunct College for Civil Engineers, Putney. His first professional employment was in connection with land and harbour surveying, in which he was engaged for about two years. He then became an Assistant-Engineer on the construction of the Great Northern Railway and so efficiently did he perform his duties during the five years he held that post that the Consulting Engineer of the