

gentlemen, carefully educated him for the profession of an engineer. When he was seventeen he became a pupil on the works of the Sheffield and Lincolnshire railway, of which Mr. John Fowler, Past-President Inst. C.E., was Engineer-in-Chief. At the end of 1850, the works being nearly completed, young Barton was transferred to Mr. Fowler's London office, and till about the middle of 1852 was employed on Parliamentary surveys and evidence. He next went to Australia, and for a short time his professional career was suspended. He then returned to England. In 1856 he again went out, this time on the staff of Mr. John Whitton, M. Inst. C.E., under whom he was engaged upon railway works for the Government of New South Wales. He was principally occupied in exploring and surveying the mountain ranges for a line of railway from Sydney to Bathurst. On the termination of this engagement under Mr. Whitton, about the year 1866, Mr. Barton retired from the profession. He was elected an Associate of the Institution on the 7th of February, 1860, and he died on the 23rd of February, 1877.

MR. CHARLES BERWICK CURTIS, the youngest son of Sir William Curtis, Baronet, Lord Mayor of London in 1795, and for thirty-five years M.P. for the City, was born at Cullands Grove, Southgate, Middlesex, on the 18th of March, 1795. Having been educated at Harrow, where he was contemporary with many men of note, including Lord Palmerston and Sir Robert Peel, he afterwards travelled, in the years 1815 and 1816, through Russia to Constantinople and parts of Asia Minor, returning to England through Greece and Italy.

In 1820 he, at the recommendation of his father, entered into partnership with his cousin Thomas Curtis and William G. Harvey, the latter having for some time previously been associated with the manufacture of gunpowder. The business at first was small, and was carried on solely at the works, near Hounslow; but it gradually developed, and, by the acquisition of more establishments, the name became associated with every description of gunpowder, for mining, sporting, and Government purposes, until the firm's transactions became equal to, if not larger than any other in the United Kingdom. At the time of Mr. Curtis's death the firm owned six factories, situated in Middlesex, Kent, South Wales, and Argyleshire, employing, in various ways, nearly a thousand hands.

From the earliest history of the firm of Curtis's and Harvey,

Mr. C. B. Curtis was in almost every branch of progress most intimately identified. He took special interest in the manufacturing department of the business, practically exercising his usefulness at the factories; introducing methods of work which to this day are in use, and by his assiduity leading on the workmen to attain results which have greatly added to the firm's success. In earlier times large transactions were entered into with the Board of Ordnance, and afterwards the War Department, and in the intercourse with the officials, Mr. Curtis invariably exercised an active part. In the manufacture of sporting gunpowder, too, his hand and head were ever ready to improve; and the increase to this special trade may, in a large degree, be attributed to Mr. Curtis's great attention to the practical details in early times. Mr. Curtis continued his activity in business for nearly half a century (from 1820 to 1869), when he was compelled by illness to relinquish the position he had so long held, and to spend the remainder of his days—which were brought to a termination on the 26th of October, 1876—in comparative retirement.

Mr. Curtis was elected an Associate of the Institution on the 1st of March, 1842, his nomination paper bearing the signature of Mr. John Farey as proposer, and the seconders being all men of considerable professional eminence. In June of the same year he presented a "Description of a Self-acting Signal for Railways."¹ The invention, which was admitted by many persons competent to judge to have been well devised and excellent in most respects, was "at work for a considerable period at the London and Birmingham, and Great Western railways," and fully answered the expectations entertained of its efficacy. But the companies preferred manual to mechanical working, and the invention has therefore remained dormant, though signals differing but little in principle from Mr. Curtis's have recently been again brought forward.

Mr. Curtis was buried at Kensal Green cemetery, on the 1st of November, 1876, the funeral being attended by large numbers who had been in his employ for many years.

Mr. JAMES DREDGE was born in London on the 17th of September, 1848, and was educated at Morden Hall, Surrey. At sixteen years of age he was articled to his father, and remained with him first as a pupil and afterwards as an assistant—partly prac-

¹ *Vide Minutes of Proceedings Inst. C.E., vol. ii. (1842), p. 186.*