

to Birmingham, where he continued and extended his consulting and arbitration business. He worked with Sir Robert Clifton in developing the Clifton Colliery near Nottingham, and acted as Consulting Engineer also for the Duke of Portland, Lord Wharncliffe and others. One of his important arbitrations was the North Staffordshire Coal and Ironstone Trade Arbitration in 1875. Mr. Brown was elected a Member of The Institution of Civil Engineers in 1858. He was also a Fellow of the Geological Society, and a Member of the Iron and Steel Institute; the North of England Institute of Mining Engineers; the Cleveland Institute of Mining Engineers; the Chesterfield and Derbyshire Institute of Mining Engineers; the Midland Institute of Mining Engineers; and the South Staffordshire and North Staffordshire Mining Institute, of which last he was for a period the President. On the institution of the Professorship of Mining in the Mason Science College, Birmingham, he was appointed to fill the chair, which he held for one year.

He had a very extensive knowledge of the mining characteristics and conditions of the Midland district. This, combined with a retentive memory, a strictly methodical system of working, a markedly judicial habit of mind in criticising the cases laid before him, and a frank and kindly manner, led to his being widely trusted in arbitration cases, and to his advice in private enterprises being highly valued. Unfortunately a certain quickness of temper led to his frequent premature abandonment of posts where his more permanent service would have been desirable. His pupils describe him as a kind and considerate master, and his generosity towards his personal friends, not only in money matters, but also in imparting professional information, was lavish to a high degree.

WILLIAM ARMITAGE BROWN was born at Plymouth on the 8th of August, 1836. His father was a surgeon, and young Brown studied for a few years with the intention of following the same profession, passing some examination for the purpose. He, however, abandoned the idea, and became pupil and apprentice to Mr. J. E. Hodgkin, of Suffolk Works, Birmingham, in January 1855. In 1858, Mr. Hodgkin retired from business, and Messrs. Charles and Walter May, and George Mountain became his successors, with whom Mr. Brown went through the ordinary routine of the shops and drawing-office. After this he spent some time in the London

office as draughtsman. Thence, in 1860, he went to Pernambuco, Brazil, for Mr. (now Sir) Charles Hutton Gregory, and was engaged on bridgework for the Recife and São Francisco Railway Company. Mr. Brown spent nearly two years in Brazil, and on his return to England, he in 1862 entered the service of the London, Chatham and Dover Railway under Mr. William Mills, the Engineer to the Company. Mr. Brown served first as draughtsman, and subsequently as Chief Office Assistant. He continued in that position until the early part of 1879, when he was appointed Inspecting Engineer for the permanent-way materials for the same line, which post he held until his death. In 1863 Mr. Brown took out a patent for a train-speed indicator, and in the same year he, conjointly with the late Mr. Richard Lionel Jones, patented a single-handed signal-lamp. He was engaged on a patent for steel sleepers at the time of his death, which occurred on the 28th of August, 1888.

Mr. Brown was elected an Associate of the Institution on the 3rd of February, 1874, and was transferred to Member on the 15th of December, 1885.

HENRY CARR was born in Derby, on the 24th of November, 1817. On the death of his father, when he was only six weeks old, his mother with her two children, the subject of this memoir and his sister, went to Holbrook, near Derby, to reside with her father-in-law, the Rev. John Carr, and here Henry Carr remained sixteen years, until the death of his grandfather, when the family removed to Duffield. The intention was to educate him for Holy Orders. He was sent to Oakham Grammar School, as well as several other schools. He, however, evinced no inclination or taste for classical studies, but took the greatest interest and delight in carpentry, and indeed in any kind of mechanical work. Before he was nine years old he had saved up his money to buy a lathe, and all his spare time was spent at his lathe or carpenter's bench. It was then that the wise decision was come to of allowing him to choose a profession in accordance with his own inclinations and taste, and in January 1837 he was articled as a civil engineer to Mr. (afterwards Sir William) Cubitt, and started work in Mr. Cubitt's London office.

Mr. Carr's first expedition was with Mr. Cubitt to the North of Ireland, a trip he always looked back upon with the greatest pleasure as having afforded him the advantage of close contact with Mr. Cubitt during the time the latter was examining various