

ALEXANDER MACKINTOSH, second son of the late William Mackintosh, of Geddes, Nairnshire (a Surgeon-Major in the Madras Army), was born in Edinburgh on the 8th July, 1820, and educated first at the Academy, and afterwards at the High School in that city. He was a pupil of the late Mr. Joseph Cubitt, V.P. Inst. C.E., and was engaged on the surveys of the South Eastern Railway, and afterwards upon the construction of that line, acting as Resident Engineer on one or more of the sections. In 1844 he was employed under the late Mr. Henry Robertson upon the surveys for the North Wales Minerals Railway from Saltney to Westminster Colliery at Ruabon, as well as several mineral branches to Minera, the Wheatsheaf, &c. This line formed the original portion of the Shrewsbury and Chester Railway which was opened in 1846 from Chester to Ruabon, and afterwards extended to Shrewsbury. Mr. Mackintosh was also engaged upon the construction of the line, the principal works being the well-known Dee viaduct over the vale of Llangollen, and the viaduct at Chirk. He was likewise engaged upon the Oswestry branch, and upon nearly all of the mineral lines which were made in the mining districts adjoining the Shrewsbury and Chester Railway. After the opening of the latter, he acted as its Resident Engineer, during which period he resided at Gresford. On the absorption of the Shrewsbury and Chester Railway by the Great Western Company in 1854, Mr. Mackintosh retained charge of the Chester lines, and also became Engineer of the joint stations of Shrewsbury and Chester under the Great Western Company, and was engineer for several extensions, new works, &c., for them in that district. In 1860 he was appointed principal engineer for the northern division of the Great Western Railway, taking up his headquarters at Reading, subsequently acting as principal Resident Engineer under the late Mr. Michael Lane, and at various times residing at Slough, Reading, and Worcester. In 1866 he resigned his position on the Great Western Railway in order to enter into partnership with his friend Mr. Henry Robertson, who was then M.P. for Shrewsbury. Messrs. Robertson and Macintosh practised as engineers at 5, Westminster Chambers, until the death of Mr. Henry Robertson. During the partnership they constructed the Vale of Llangollen Railway, the Bala and Dolgelly, the Bala and Festiniog, and other branches in the North Wales district, and also the important Central Wales Railway extension from Knighton in Radnorshire to Llandoverly. This latter was a heavy line to construct, the principal works being Llanrwytyd viaduct, the Knighton viaduct,

several tunnels and heavy earthworks. This line was subsequently acquired by the London and North Western Railway Company, and now forms that company's principal communication between South Wales, Manchester, and the North.

Mr. Mackintosh was an original shareholder, taking a leading part in the Minera Lead Company and the Minera Lime Company, of which he became a director. He was principally instrumental in forming the Wrexham Colliery Company, now one of the largest and most important collieries in North Wales; and of this company he was for many years chairman, and was a director at the time of his death. Mr. Mackintosh was a man of culture and of considerable attainments. He was very painstaking, and extremely methodical in all business affairs; quiet and unpretentious in his mode of living, and a man of sterling honour, thoroughly trusted by all his friends. Socially, he was an excellent companion, and possessed a rare fund of quaint Scotch humour. His health during the past ten years had been failing, and he died at Blackheath on the 23rd of March, 1890.

Mr. Mackintosh was elected a Graduate of the Institution on the 18th of February, 1840, and was transferred to full Member on the 13th of February, 1849.

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ALFRED PENNY, who came of a Somersetshire family, was born in London on the 11th of October, 1811. Not much is known of his early career, but it is believed that his engineering experience dates from 1844, when he became a partner in an establishment for the manufacture of machinery for paper-making, steam-engines, &c. In this venture Mr. Penny was not successful, and in 1849 he was agent for Messrs. James Oakes & Company, ironmasters of Alfreton, Derbyshire, in which capacity he was brought into contact with numerous provincial gas companies, and persons interested in gas. In 1850 he began business on his own account as a gas engineer, and for a time also as contractor, having established the Wenlock Ironworks, in the Wharf Road, City Road. Here he constructed gas-holders and general gas-plant for gas-works in different parts of the country. In these enterprises he was associated with all the pioneers of the gas industry, whose names are now almost forgotten. From building small works, Mr. Penny became lessee of undertakings of his own creation, and also of larger ones—including the works at Whitehaven, Portsmouth and Oporto. In this way Mr. Penny made a