

Arthur J
KNOWLES

James
BLACKBURN

Sir William
ARROL

Sir Benjamin
BAKER

Joseph
PHILLIPS

Frederick E.
COOPER

Andrew S.
BIGGART

William N.
BAKEWELL

A. J.
SYMONDS

Marquis of
TWEEDDALE

Spencer
BRUNTON

Reginald E.
MIDDLETON

P. Walter
MEIK

Sir M. W.
RIDLEY

William U.
HEYGATE

Samuel
BALBIRNIE

Thomas
SCOTT

Louis
NEVILLE

Lord
COLVILLE

Walter S.
BOURKE

Duncan
CAMPBELL

Rudolph
LILLIQUIST

Sir M. W.
THOMPSON

Earl of
ELGIN

Wilhelm
WESTHOFEN

George
AITKEN

Alex
CHALMERS

James Hall
RENTON

Lord
HINDLIP

Maurice
FITZMAURICE

T.
MAIN

Ernest W.
MOIR

E. Malcolm
WOOD

Adam
HUNTER

Allan D.
STEWART

John Dent
DENT

Axel
SCHLUTER

William
GRAY

Alfred E.
MAVOR

Evelyn
CAREY

J. B.
WEBSTER

G. B.
WIELAND

James B.
TUIT

John
WALKER

William
White
MILLAR

John
NOBLE

Henry
OAKELEY

David
HARRIS

Sir John
FOWLER

Names in Shields:
Sir T. TANCRED T. H. FALKINER
J. LAW J. MARTIN

Names omitted:

Richard HODGSON
Monsieur L. COISEAU

John STIRLING
Kaichi WATANABE

THE FORTH BRIDGE COMMEMORATIVE PORTRAIT GROUP

2012/002

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Brief Biographies

AITKEN, George (-) A fitter at the Arrol Works in Dalmarnock and foreman fitter on the Forth Bridge construction works. George was also a foreman of the team brought in at the initial stages of the Arrol works at Tower Bridge and, unlike most of the workers who were paid an hourly rate, George was salaried, earning £3 per week

ARROL, Sir William (1839-1913) Born at Houston, Renfrew-shire; apprenticed to a blacksmith in Paisley at age 14; in 1868 he founded a small engineering business and soon established his reputation as a builder of railway bridges. The Forth Bridge was his greatest achievement, but at the same time (1882-1890) he was also building the second Tay Bridge, Tower Bridge in London, and a dozen bridges across the Manchester Ship Canal.

BAKER, Sir Benjamin (1840-1907) Born in Somerset, educated at Cheltenham Grammar School; apprenticed at Neath Abbey Ironworks at age 16. In 1861 joined the staff of Sir John Fowler in London, becoming his partner in 1875. From about 1865 he made a special study of long span bridges in which he developed the cantilever principle adopted for the Forth Bridge in 1881. During the building of the bridge from 1883 to 1890 he virtually lived on the site, supervising every detail of construction and checking the quality of the materials used. Elected a Fellow of the Royal Society in 1890, he was President of the Institution of Civil Engineers in 1895-96.

BAKEWELL, William N. (1845-1913) Worked as contractor's engineer on the Forth Bridge, principally on surveying and setting-out duties, and later on the Tower Bridge, the Aswan Dam, the English Bridge at Cairo and irrigation schemes in Asia Minor.

BALBIRNIE, Samuel [NO INFORMATION]

BIGGART, Andrew S. (-) During construction of the Forth Bridge he was Arrol's Agent in charge of the drawing offices, fabrication shops and yards.

BLACKBURN, James [NO INFORMATION]

BOURKE, Walter S. [NO INFORMATION]

BRUNTON, Spencer (-) Director of the Forth Bridge Railway Company, elected by the shareholders.

CAMPBELL, Duncan [NO INFORMATION]

CAREY, Evelyn (1858-1932) was an assistant engineer on Fowler and Baker's staff, with an interest in the then relatively new art of photography. He was appointed official photographer, and between 1883 and 1889 took several hundred views of the bridge under construction. They form a pictorial record of outstanding interest, and have been reproduced in virtually every book on the Forth Bridge, and in countless exhibitions including this one.

CHALMERS, Alex [NO INFORMATION]

COISEAU, Monsieur L. (-) A French specialist in underwater work on sea-walls, docks and harbours, he was the sub-contractor for the sinking of the caissons within which,

under compressed air, the foundations for the Forth Bridge were constructed.[NOT INCLUDED IN GROUP]

COLVILLE of CULROSS, Lord (1818-1903) Educated at Harrow. Director of the Forth Bridge Railway Company, representing the Great Northern Railway Company.

COOPER, Frederick E. (1841-1933) Joined Sir John Fowler's staff in 1863, and acted as Resident Engineer on the construction of the Forth Bridge from 1886 to its completion in 1890.

DENT, John Dent (1826-1895) Director of the Forth Bridge Railway Company, representing the North-Eastern Railway Company.

ELGIN AND KINCARDINE, Earl of (1849-1917) Born in Canada, where his father was Governor-General; educated at Glenalmond, Eton and Balliol College, Oxford. Viceroy of India, 1893-99. Director of the Forth Bridge Railway Company, representing the North British Railway Company.

FALKINER, Travers H. (1829-1897) Born in Co. Tipperary, he entered Trinity College, Dublin in 1845 and left after one year with honours in mathematics. He worked on a succession of railway contracts in Ireland and elsewhere, in the course of which he formed a partnership with Sir Thomas Tancred. He was thus associated with the contracting firm of Tancred, Arrol and Company on the building of the Forth Bridge.

FITZMAURICE, Sir Maurice (1861-1924) Educated at Trinity College, Dublin, he worked on the construction of the Forth Bridge, the Blackwall and Rotherhithe Tunnels and the Aswan Dam. He later became Chief Engineer to the London County Council, and President of the Institution of Civil Engineers in 1916-17; he was elected a Fellow of the Royal Society in 1919. Author of 'Plate Girder Railway Bridges' and other works.

FOWLER, Sir John (1817-1898) Born at Wadsley Hall, Sheffield and educated at a private school, he worked on numerous railway projects during the 'railway mania' in the 1840s. With Baker as his assistant he built the Metropolitan underground railway in London in the 1860s, and acted as consultant on many other engineering works at home and abroad. He was consulting engineer to the Great Western, Great Northern, Brighton and Highland Railway Companies. In 1881 he and his partner Benjamin Baker began work on the design of the Forth Bridge. He was President of the Institution of Civil Engineers in 1866-7.

GRAY, William (-) According to Westhofen, Gray was in charge of all excavation and masonry work, 'besides other duties of the most multifarious character'.

HARRIS, David (-) A member of Arrol's site staff. Also worked on the construction Tower Bridge, London.

HEYGATE, William U. (1825-1902) Educated at Eton and Merton College, Oxford; called to the bar. Director of the Forth Bridge Railway Company, representing the Midland Railway Company.

HINDLIP, Lord (1842-1897) Educated at Harrow and Trinity College, Cambridge. Director of the Forth Bridge Railway Company, representing the Great Northern Railway Company.

HODGSON, Richard (-) of Carham Hall, Coldstream. The Chairman of the Board of Directors of the North British Railway Company, c1850-1866. One of the first men to appreciate the necessity for a railway bridge across the Forth. [NOT INCLUDED IN GROUP]

HUNTER, Adam (1869-1933) On Arrol's staff during construction of the Forth Bridge; later became chief engineer of Sir William Arrol and Company. Author of 'Bridge and Structural Engineers' Handbook'.

KNOWLES, Arthur J. [NO INFORMATION]

LAW, J. [NO INFORMATION]

LILLQUIST, Rudolph (-) An engineer with Fowler and Baker on the Forth Bridge.

MAIN, T. [NO INFORMATION]

MARTIN, J. [NO INFORMATION]

MAVOR, Alfred E. [NO INFORMATION]

MEIK, P. Walter (1851-1910) Son of Thomas Meik, civil engineer, of Edinburgh; educated at Edinburgh University; with his brother practised as consulting civil engineers in London from 1896. Resident Engineer for Fowler and Baker on the Forth Bridge from 1883 to 1886.

MIDDLETON, Reginald E. (1844-1925) Educated at Charterhouse; apprenticed to Robert Stephenson at Newcastle upon Tyne. In charge of the primary survey work for the Forth Bridge. Subsequently acted as consultant to many water supply companies, and in the promotion of the Highland Water Power Bill of 1899. Chartered civil and mechanical engineer; Fellow of the Surveyors' Institution.

MILLAR, William White [NO INFORMATION]

MOIR, Sir Ernest W. (1862-1933) Educated at University College, London. On Arrol's staff at the Forth Bridge, and resident engineer for Sir Benjamin Baker on the Hudson River Tunnel, New York. Later he was for some years a partner of Lord Cowdray, and a director of his contracting firm Pearson & Son.

NEVILLE, Louis (-) Arrol's engineer on the approach railways to the Forth Bridge.

NOBLE, John (1828-1896) Born in Kendal and educated at the Friends School there. Began his career as a clerk in the Railway Clearing House in London, eventually becoming General Manager of the Midland Railway Company, 1880-1892.

OAKLEY, Sir Henry (1823-1912) General Manager of the Great Northern Railway Company at the time of the Forth Bridge's completion.

PHILLIPS, Joseph (1828-1905) Apprenticed at the Regents Canal Ironworks, he went on to gain much valuable experience on the construction of large bridges, including the Clifton Suspension *Bridge*. He and his partners, Sir Thomas Tancred and Travers Falkiner, combined with William Arrol to tender for the Forth Bridge, on the construction of which he acted as agent and general manager.

RENTON, *James* Hall (1822-1895) A director of the Stock Exchange; also of the West Highland Railway, and the London, Chatham and Dover Railway. Director of the Forth Bridge Railway Company, elected by the shareholders.

RIDLEY, Sir Matthew W. (1842-1904) Born in London of a Northumberland family. Captain of Harrow in 1860, he gained a scholarship to Balliol College, Oxford. Director of the Forth Bridge Railway Company, representing the North-Eastern Railway Company.

SCHLUTER, Axel [NO INFORMATION]

SCOTT, Thomas (-) A site manager on Arrol's staff at the Forth Bridge.

STEWART, Allan D. (1831-1894) Born in Scotland, graduated with honours in mathematics at Cambridge in 1853. Practised as a railway civil engineer in Edinburgh, and over many years up to 1880 acted as assistant to Sir Thomas Bouch on the design of numerous bridges and other structures, including the ill-fated first Tay Bridge. From 1881 to 1890 he acted as chief assistant engineer to Fowler and Baker on the design of the Forth Bridge.

STIRLING, John (1811-1882) of Kippendavie. As Chairman of the Board of Directors of the North British Railway Company from 1866 to 1882, he pursued, but did not live long enough to see, Richard Hodgson's objective of two great railway bridges across the Tay and Forth. [NOT INCLUDED IN GROUP]

SYMONDS, A. J. (-) An official of the North British Railway Company at Burntisland.

TANCRED, Sir Thomas (1840-1910) Educated at Radley and Bradfield, he was both a consulting engineer and a contractor in partnership with Travers Falkiner; with Phillips and Arrol, they were awarded the Forth Bridge contract in 1882. It is recorded that on 6th June 1883 Sir Thomas laid the first granite block with full masonic honours.

THOMPSON, Sir Matthew William (1820-1891) Born Yorkshire; educated at Trinity College, Cambridge; called to the bar, 1847. Chairman of the Board of Directors of the Forth Bridge Railway Company, representing the Midland Railway Company.

TUIT, James E. (1860-1906) was educated at King's College, London, and trained in the engineering department of the Great Western Railway. He joined the staff of Fowler and Baker in 1882 and worked on the Forth Bridge until 1889, when he went to London to take charge of the construction of the Tower Bridge for Sir William Arrol and Company.

TWEEDDALE, Marquis of (1826-1911) Educated at Haileybury; served in the Bengal civil service, 1845-62. Director of the Forth Bridge Railway Company, representing the North British Railway Company.

WALKER, John (1828/29-1891) Born in Fife, apprenticed to a writer in Cupar. Entered the service of the Edinburgh, Perth and Dundee Railway Company, and eventually became General Manager of the North British Railway Company, 1874-91. For many years his statue stood in the booking hall at the Waverley Station.

WATANABE, Kaichi (1858-1932) A Japanese apprentice engineer with Fowler and Baker, he took the part of the suspended span in the human model demonstrating the principle of the cantilever, a photograph of which can be *seen* in this exhibition. After his return to Japan he eventually became President of several Japanese railway companies. [NOT INCLUDED IN GROUP]

WEBSTER, J. B. [NO INFORMATION]

WESTHOFEN, Wilhelm (1842-1925) Arrol's engineer in charge of the works on Inchgervie, he wrote the definitive account of the bridge's design and construction published in 1890 by the journal 'Engineering'.

WIELAND, George Bradley (-1905) Secretary of the Forth Bridge Railway Company, and of the North British Railway Company. Died in office.

WOOD, E. Malcolm [NO INFORMATION]