



The Royal Institution of Naval Architects and Lloyd's Register

Given their common roots in the UK maritime industry, it is not surprising that throughout the 150 years in which the histories of both organisations have overlapped, many members of the Institution have held important positions within Lloyd's Register. Such connections can be traced back to 1860, when the joint Chief Surveyors, Joseph Horatio Ritchie and James Martin were two of the 18 founding members of the Institution.

The Lloyd's Register Historian, Barbara Jones, has identified others who either worked for Lloyd's Register in some capacity, or who sat on its Committees, and had a direct connection with the Institution of Naval Architects, later to become the Royal Institution of Naval Architects.

Introduction

The Royal Institution of Naval Architects was founded in 1860 as the Institution of Naval Architects. John Scott Russell, Dr Woolley, E J Reed and Nathaniel Barnaby met at Scott Russell's house in Sydenham for the purpose of establishing the Institution. The Institution was given permission to use "Royal" in 1960 on the achievement of their centenary. There have been very close links between LR and INA/RINA from the very beginning. The joint Chief Surveyors in 1860, Joseph Horatio Ritchie and James Martin were two of the 18 founding members and were jointly responsible for producing Lloyd's Register's first *Rules for Iron Ships*.

Chas. Jordan, another highly regarded LR surveyor was an Associate Member from 1861 and a member from 1868, noted that membership at commencement numbered 324 and many renowned Master Shipwrights were members. He noted "the Institution from its commencement has exercised a most beneficial effect on naval architecture, and its influence in all matters relating thereto has been of world-wide importance."

Many notable surveyors have been members, from Chas. Jordan mentioned above, who worked at one time in John Scott Russell's shipyard and was present not only when the *Great Eastern* was launched but was also on board her for her maiden voyage, Bernard Waymouth who did so much research into composite construction and designed *Thermopylae*, *Leander* and *Macquerie*, Harry Cornish, gifted artist and Chief Ship Surveyor, Benjamin Martell whose work on freeboard tables did much to assist Samuel Plimsoll with his campaign against "coffin ships" and who he knew personally and

would ensure the government could bring in regulations based on sound principles based upon Martell's calculations and tables.

Thomas Chapman

Known as 'The Father of Lloyd's Register', it is impossible to over-estimate the value of Thomas Chapman's services to Lloyd's Register during his forty-six years as Chairman. He was a highly respected and successful merchant, shipowner and underwriter. He was to remain Chairman of Lloyd's Register for 46 years and steer the organisation through many difficult periods.

He was a hugely influential Chairman. With Secretary Charles Graham, he was instrumental in setting the committee structures and reporting procedures, many of which remain today. He joined most of the visitations to outports and rarely missed a committee meeting. Noted for his 'consummate tact, urbanity of manner and conciliatory disposition', he was distinguished in several other fields, being head of an import-export business, John Chapman & Co. of Leadenhall Street; shipowner; underwriter; philanthropist; fellow of the Royal Society and the Society of Antiquaries; Chairman of the Royal National Institution for the Preservation of Life from Shipwreck and was also involved in the Shipwrecked Mariners Society. He was on the Committee of the RNLI and elected its Chairman in 1873. The RNLI subsequently named a lifeboat after him. He was also Vice President of Institution of Naval Architects.

From his obituary "He was the true father of Lloyd's Register as we know it in its unique position today, and

as such he was a national servant of infinitely more importance than many whose names are hammered into the minds of school children.”

In addition a number LR people appeared before the Select Committee to inquire into the cause of shipwreck. These were held three times during the 19th century and a number of LR people gave evidence including Charles Graham, Secretary, and George Bayley, Principal Surveyor.

Joseph Horatio Ritchie

Born in Port Glasgow and apprenticed to John & Charles Wood, builders of the *Comet*, on completion of his indentures he was sent to St John, New Brunswick by Pollock, Gilmour & Co to build three ships for their timber trade. He then joined Charles Wood in Quebec to build and deliver the timber raft *Baron of Renfrew*. A brief partnership with John Wood followed before he established himself as a shipbuilder on the Thames at Rotherhithe. When this failed he applied for, and was given, a post as a Lloyd's Register surveyor.

Appointed joint Principal Surveyor with James Martin, they were entrusted with the drafting of the new rules for iron ships. Ritchie was a strong supporter of Moorsom in the revision of tonnage measurement, he was also responsible for the formation of the Institution of Naval Architects together with the other joint Principal Surveyor, James Martin. There were a total of 18 founding members. He and Martin also helped to found the Royal School of Naval Architecture and Marine Engineering.

On behalf of the Sub-Committee they visited many of the shipyards experienced in iron building, and from their observations were able, at a Conference of Senior Surveyors held at Glasgow in February 1854, to draft the proposed new iron rules for the Sub-Committee to consider.

Chas Jordan

Jordan was a member of the Institution of Naval Architects from its earliest days. Jordan was our last sailing ship surveyor and also had a lot of experience on iron construction as he had served his apprenticeship at John Scott Russell's yard at Millwall amongst others. Soon after his retirement in the early 1920s LR asked him to survey and draw the lines of the *Cutty Sark* when in drydock because of his experience with sailing ships. He wrote his reminiscences in 1924.

Jordan worked on the building of the *Great Eastern* at Scott Russell's yard, working on her fittings and also in the drawing office on her plans and took part in her launch attempted on November 3, 1857. She was the largest vessel in the world until exceeded by White Star Line's *Oceanic* of 1889. Passenger steamboats would come down the river to see her construction and Jordan reports they heeled alarmingly when close by as the

passengers crowded to one side to see the “Great Ship”. Many rivet boys were killed during her construction by falling from planks laid on deck beams while running with heated rivets for the riveters. She was to be launched sideways with the assistance of two hydraulic rams and pulleys attached to winches. Jordan was stationed at the after end ram and had to carry orders from the head of the engineering department, Mr Dixon to the engineer in charge of the winch. The launch was a disaster and several men killed. A successful launch was made on 6, 7 and 14 January 1858, using 21 hydraulic rams and she finally floated on 31 January. Jordan was onboard when she left for her maiden run down the river to Purfleet on September 7, 1859, and then steamed to Gravesend where Brunel was taken ill with the stroke from which he died.

One of the earliest naval vessels with which LR was involved was built at Scott Russell's yard during Jordan's time there. This was the *Donna Maria Anna* a wooden auxiliary screw gunboat of 409 tons built for the Portuguese government. She was classed by LR and inspected by Bernard Waymouth during construction.

Jordan served his apprenticeship at Scott Russell's with Herr Meyer, son of Meyer the shipbuilders at Papenburg. A number of other shipbuilders served their apprenticeships with Scott Russell and Jordan knew them including Oswald who built the yard at Woolston, Southampton, probably where VT Shipbuilding have been latterly. He also knew Byron Noel, Viscount Okum and Baron Wentworth, eldest son of the Earl of Lovelace, husband of Ada, Lord Byron's only daughter, and known for her work with Charles Babbage's analytical engine. He worked in the pattern shop and worked on cutting out the teeth of the wrought iron rack for turning the paddle wheels of the *Great Eastern*.

In March 1889 he was sent by LR to Cadiz to superintend the repair of an extensively damaged steamer. The ship was dry docked at Carracas, a naval dockyard 8 miles from Cadiz. In the adjacent dry dock was a submarine recently invented by Lieutenant Sen. Paral of the Spanish Navy, and the authorities were anxious that she should not be seen so poor Jordan was escorted to and from the vessel he was surveying by marines with fixed bayonets.

Benjamin Martell

Having trained at the Royal Dockyard, Portsmouth, as a naval architect, Martell joined Lloyd's Register in 1856 after experience as manager of Charles Lamport's Workington shipyard. Charles Lamport's brother was a founder of the Lamport & Holt Line in Liverpool. Martell commenced his Lloyd's Register career as assistant surveyor at Sunderland. This was followed by appointments as surveyor at Greenock, Southampton, Leith, Sunderland and North Shields before, in 1872, being selected to succeed Waymouth as Chief Surveyor, a post he held until retiring in 1900.

At the behest of the Committee he prepared, in 1873, Tables of Freeboard. In 1880 the Board of Trade broached the subject of whether load lines for awning deck ships could be extended to other types. Martell's work, which had been submitted to the Royal Commission on Unseaworthy Ships, was made available to the Board of Trade. Much further material was obtained from shipowners, builders and others, which Martell used to prepare Tables issued in 1882. The following year the Board of Trade appointed a Committee to consider the application of load lines which developed until, in 1890 the Merchant Shipping Act was passed which consolidated Lloyd's Register's position by requiring the Board of Trade to appoint them to assign freeboards.

Short of stature, he was known as "Little Benjamin our Ruler" by many shipbuilders. On his retirement he endowed a scholarship in Naval Architecture.

Bernard Waymouth

Prior to his appointment as a surveyor by Lloyd's Register in 1854, Waymouth had worked in an Admiralty Dockyard and spent time in a private yard. He was promoted to Principal Surveyor in 1870 and succeeded George Bond Seyfang in the position of Secretary in 1872. He died in harness, collapsing whilst addressing a Committee meeting in November 1890. His technical expertise made him one of the more important members of the staff during the Victorian age. His contribution was not limited to technical matters but also included strengthening and developing the position of Lloyd's Register.

He was closely involved in the drafting and developing of rules. He drafted the provisional composite rules in 1866 and designed ships ranging from the tea clippers *Thermopylae*, *Macquerie* and *Leander* to Sir Edward Sullivan's schooner yacht *Shamrock*. His hand in the 1870 iron ship rules did much to maintain Lloyd's Register's standing in the face of competition. Promoted to Principal Surveyor in 1870 and Secretary two years later, the enlargement of the Register Book from a volume listing classed ships into one that contained all the world fleet took place under his supervision as secretary, as also did the steady growth of the world wide network of surveyors. He took a leading part in the reorganisation of the Committee in 1883 to provide greater outport representation, and was a prime mover in the amalgamation of the Liverpool Underwriters' Register with Lloyd's Register, also the establishment in 1884 of the Lloyd's Register pension scheme.

He was a Vice-President of the Institution of Naval Architects. Other tasks undertaken included

membership of the Royal Commission on Tonnage, and into the loss of HMS *Atalanta*. A sail training frigate she had sailed from Bermuda, bound for England, on 31 January 1880 and was never heard of again. With 280

officers, men and boys on board it is thought she may have been sunk in a terrific gale that raged for several days in mid-February.

Harry John Cornish

Harry Cornish was born at Devonport on October 17, 1839. He began his career as naval architect at Charles Langley's Deptford Green Shipyard, a yard which had in 1858 undertaken the completion of fittings etc. for Brunel's *Great Eastern*. Harry was placed in charge of some of that work. In 1863 he was appointed ship surveyor by Lloyd's Register, an organisation he was to remain with for the rest of his working life. Soon after his appointment, Harry's artistic expertise came to the fore when he illustrated the *Rules for Iron Ships*, the amendments for which were then under discussion. His artistic rendition of the principal of these *Rules* were engraved and bound within the published *Rules* when the research was completed and they were adopted.

By this time Harry was working with Bernard Waymouth, Principal Surveyor to Lloyd's Register and designer of the tea clipper *Thermopylae*. From 1866 Waymouth was charged with formulating and preparing the *Rules for the Construction of Composite Ships*, ably assisted by Harry Cornish. The *Rules* were adopted in 1868, prior to this it was decided to run a competition amongst the young surveyors to illustrate these *Rules* and of course Harry Cornish with his beautifully executed artwork, technically correct but showing a lightness of touch, won the competition.

After Bernard Waymouth's promotion to Secretary of Lloyd's Register, Harry Cornish worked with his successor, Benjamin Martell on the introduction of compulsory load-lines for ships. After Samuel Plimsoll's campaign against 'coffin ships' in the House of Commons, the Board of Trade adopted Lloyd's Register and Mr Martell's tables and formulae for load lines. When Martell retired in 1900, Harry Cornish was appointed Chief Ship Surveyor, a position he held until his retirement in 1909. During his time with Lloyd's Register, remarkable developments had taken place in shipbuilding. Steel had replaced iron as a constructive material, and the sizes of ships had increased immensely. In the consequent revisions and extensions of Rules Mr Cornish necessarily took a leading part. When the designs of the *Lusitania* and *Mauretania* were being prepared, there being no Rules suitable for such large vessels, Harry was in constant consultation with the owners and builders of these vessels.

Harry died in 1928, many tributes were paid to him and it was said that his charming manner and artistic talent made him an agreeable companion, and that he had a wide circle of friends, whose companionship he had enjoyed during a very long professional career.

Sir Westcott Stile Abell

Naval architect and surveyor. Entered Royal Corp of Naval Constructors in 1900, based at Devonport

Dockyard. Assigned to the Committee on Designs appointed by Sir John (Jackie) Fisher. Became lecturer at Royal Naval College, Greenwich in 1907 and in 1909 became a member of INA. Worked from 1913 on Committee appointed by Board of Trade to examine load lines and had a lifelong interest and association with solution of problems of safety of life at sea. His outstanding contributions to INA on these subjects brought him to the attention of Lloyd's Register and in 1914 he was appointed Chief Ship Surveyor. During WW1 while still working at Lloyd's Register made a significant contribution in the field of merchant shipbuilding and was closely associated with the Admiralty in the construction a great number of naval auxiliary craft. He also served on a committee to determine the feasibility of submarine merchant vessels to thwart the growing U-boat menace and in 1917 was appointed technical adviser to the Controller of Shipping, while still on secondment from Lloyd's Register. After the war he returned to Lloyd's Register and turned his attention once more to ship classification and safety. The war had stimulated technological advances and he directed a complete revision of the structural requirements of the Rules and affected major amendments, which resulted in increased structural efficiency and a reduction of steel weights. He recruited many young graduates to Lloyd's Register.

He served on the load line committee in 1927 and a year later left Lloyd's Register to take up the chair of naval architecture at Armstrong College at Durham College. He was a delegate at the Safety of Life at Sea conference in 1929. He designed an English channel train ferry for use between Dover and Dunkirk. Three were built and survived to WW2 when they were used as mine-layers.

He had a profound knowledge of ships and shipbuilding and was one of those responsible for Cutty Sark being dry-docked at Greenwich, and raised concerns about the condition of HMS Victory which led Lord Mountbatten to get the woodwork restored.

He was a member of the executive committee of the National Physical Laboratory, chairman of the Froude ship research sub-committee and it was largely due to his initiative that the new ship hydrodynamics laboratory was at Feltham was completed in 1959. At the time of his death in 1961 he was senior honorary vice president of Royal Institution of Naval Architects.

Sir Joseph William Isherwood

A naval architect, he started work in the drawing office of Edward Withy & Co., shipbuilders, of Hartlepool, and, after serving in various other departments, in 1896 left that firm to become a ship surveyor for Lloyd's Register.

At Lloyd's Register, Isherwood worked in plan approval, particularly of cargo ships, and also examined the results of shipping accidents. Through this work he developed ideas for a new stronger, safer, and cheaper longitudinal girder form of ship construction to replace

the traditional traverse construction method (of ribs placed at regular intervals along the keel). He patented what became widely acclaimed as the 'Isherwood system' of construction in 1906. He left Lloyd's Register in 1907 and the first ship constructed along the lines of his system was the *Paul Paix*, completed in August 1908, with others, in Britain and elsewhere, following soon after. He was briefly a director of the shipbuilding firm of R. Craggs & Sons of Middlesbrough, then began to practise as a naval architect in London, and made a number of other significant contributions to ship design. He developed an improved 'bracketless' system and in 1933 introduced a new design of hull form, namely, the 'arcform'. Several ships of this type were commissioned soon after.

By the time of Isherwood's death in 1937, 2500 ships, cargo vessels, and oil tankers incorporated one or more of his special designs and upwards of fifty 'Isherwood' ships were under construction in the shipyards in Britain and elsewhere representing the 'arcform' design and the 'combination' and 'bracketless' systems. Isherwood also introduced a new type of steel hatch cover.

Isherwood was created a baronet in 1921 in recognition of his contributions to the progress of naval architecture and his work for the government during the First World War. The Shipbuilder and Marine Engine-Builders on his death described 'the immense value of Sir Joseph's eminently practical inventions to shipbuilders and shipowners, and his name appears indelibly on naval architectural progress' (Shipbuilder, 576). He was a member of the Worshipful Company of Shipwrights, of the Institution of Naval Architects, of the North-East Coast Institution of Engineers and Shipbuilders, and of the Society of Naval Architects and Marine Engineers, New York. He was also a member for many years of the Technical Committee of Lloyd's Register.

James Wimshurst

Electrical engineer and shipwright, he was born at Poplar, London, the second son of Henry Wimshurst, engineer. Henry Wimshurst's engineering practice was in steamships: he was one of those who built the *Archimedes* (launched 1838) and *Iris*, the first two screw-propelled ships. Wimshurst was apprenticed at the Thames ironworks to James Mare. In 1853, on the completion of his apprenticeship, he obtained an appointment in London as a surveyor at Lloyd's Register. In 1866 he went to Liverpool to become chief surveyor of the Liverpool Underwriters' Registry, then a rival establishment to Lloyd's Register, but since incorporated with it. In 1874 he joined the Board of Trade as chief shipwright surveyor in the consultative department. He attended as its representative the international conference at Washington in 1890, and retired on reaching the age limit in 1899.

About 1878 he became interested in electrical influence machines, that is to say, machines which, through the turning of a winch, were made to amass static electricity.

These machines were widely employed to produce sparks of up to 15 inches long. The sparks were not only the subject of scientific investigations, their bright colours (capable of lighting a room) also provided entertainment. The most efficient influence machines were painful to work but very powerful, sometimes altering the atmosphere of the room so that visitors left the room with pain in the ears and head. From the early 1880s onwards, Wimshurst introduced modifications of a practical kind to the existing types and then he designed a new type which subsequently became known as the Wimshurst. It consisted of two circular plates rotating in opposite directions having metallic sectors on the outer faces of each. It was self-charging and more robust under all conditions of atmosphere. Wimshurst donated machines to Silvanus P. Thompson, electrical engineer and principal of the City and Guilds Central Technical College, the Charing Cross Hospital, the Royal Institution, and the Royal Society. In 1896 Wimshurst found his machines to be an admirable means of exciting X-rays, and showed that for screen observation, where a steady illumination was desired, the steady discharge from one of his eight-plate influence machines was preferable to the intermittent discharge of the usual induction coil. His machines were also used in hospitals at the turn of the century for the production of powerful brush discharges, efficacious in the treatment of lupus and cancer.

Wimshurst also invented a vacuum pump using oil rather than mercury, an improved method for connecting lightships electrically with the shore station, and an instrument for ascertaining the stability of vessels. In 1898, in the wake of the Wimshurst machines' new-found importance in X-ray work, he was elected FRS. After his death, however, influence machines fell out of favour in X-ray work. He was a member of the Institution of Electrical Engineers, the Physical Society, the Röntgen Society, and the Institution of Naval Architects, and was a manager of the Royal Institution.

Sir William Pearce

An engineer and shipbuilder, he was born at Brompton near Chatham in Kent on 8 January 1833. He trained as a shipwright and naval architect at the Chatham Dockyard under Oliver Lang. His skill was recognized in 1861, when he was given responsibility for superintending the construction of HMS *Achilles*, the first iron-clad ship built in the naval dockyards. His experience in the new construction material brought him the position of Lloyd's Register surveyor on Clydeside in 1863, then the centre of the new iron shipbuilding industry.

Within twelve months Pearce was appointed manager of Robert Napier's shipyard to replace John Elder, who had set up in independent business with Charles Randolph. His influence on this great yard was immediate, designing pathbreaking, fast, transatlantic liners for the Compagnie Générale Transatlantique. His opportunity to become more than a manager came in 1869, when John Elder's early death set his widow and partners in

search of a new associate. Pearce's proven skills in design and management were recognized as what was needed, and he joined John Ure, J. L. K. Jamieson, and Mrs Elder as partner and manager in the reconstructed enterprise now named John Elder & Co. The company had a fine reputation for its development work on the compound marine steam engine, and under Pearce this was enhanced further in 1874 when A. C. Kirk, working at the company, developed the triple expansion engine, which was to become the workhorse of the world's merchant navies for the next half century. Pearce embarked on a rapid development of the markets served by John Elder and pushed out in three directions. In designing ships for the transatlantic route he emphasized speed, and to enhance his company's reputation he cultivated the idea of the Blue Riband for record crossings of the Atlantic. He wagered his ships would break existing records, and they did, attracting for his company many new orders, especially from Norddeutscher Lloyd and Cunard. He applied the same psychology to the fast, cross-channel steam packets, guaranteeing and achieving a crossing time of one hour each way between Dover and Calais. His third market direction was to establish the Govan shipyard as a naval builder, and he succeeded in attracting orders for hulls and engines in the 1870s as naval construction was extended to counter the expansion of Bismarck's new fleet.

Pearce's partners, Ure and Jamieson, retired in 1878 leaving him in command of what was then among the foremost shipbuilding concerns in the world, the Govan shipyard occupying over 70 acres, and employing as many as 5000 operatives. He built for the largest shipping lines, including the Pacific Steam Navigation Company, the New Zealand Shipping Company, and the British and Africa Steam Navigation Company. Pearce was a major shareholder in the first two of these, and was also chairman of the Guion Steamship Company, and of the Scottish Oriental Steamship Company.

As a leading Clydeside employer, Pearce became a commissioner for the Govan burgh, an honorary colonel of the second volunteer battalion of the Highland light infantry, and, as a mason, became provincial grand master of Glasgow. In politics he was a Conservative, and was elected as the first MP to represent the Govan division of Lanarkshire in 1885; he represented the constituency until his death. In 1886 he converted his company to limited liability status, taking the name of the Fairfield Shipbuilding and Engineering Company, of which he was chairman. In 1887, on Queen Victoria's jubilee, he was created a baronet, but enjoyed his new rank only briefly. He died suddenly at his home at 119 Piccadilly, London, on 18 December 1888, his heart weakened by the stress and high pressure of his work.

John Wigham Richardson

In 1852 he went to work as a ship's draughtsman for a few months for a relative, Senhouse Martindale, a Lloyd's Register surveyor in Liverpool. In 1853 he took up an apprenticeship with Jonathan Robson, a builder of

steam tugs in Gateshead, making iron ships and marine engines. After completing this in 1856, he spent a year at University College, London, studying Latin, German, English literature, and mathematics, and in the summer of 1857 he studied German in Tübingen. The same year he returned to Newcastle to a job in the machine-drawing office of the Forth Banks engine works of R. and W. Hawthorn (Robert Hawthorn was a neighbour).

In 1860, with his father's help, Richardson bought Coutts's yard, a small shipyard at Walker, where the first iron ship on the Tyne had been launched in 1842, and founded the Neptune Works. He appointed John Denham Christie, a naval architect, as his assistant: Christie became his partner in 1862. The Neptune Works occupied a 4 acre site, with 100 yards' river frontage and three building berths, and employment for 200 men. The first ship to be built, the *Victoria*, was a small ferry-steamer for the Isle of Wight–Portsmouth route, but business was slow in the early years. Relying mainly on overseas customers, Richardson persevered, and in 1865 secured an order from the Prussian government for a steamer to carry railway trains across the Rhine, the first of many such ferries built by the yard. As business grew, thanks to Richardson's energetic pursuit of new orders, he decided to open his own marine-engine and boiler works in 1872, and in 1879 he appointed a marine-engine designer, John Tweedy.

By the 1880s the yard was building every kind of ship except warships, and despite the slump of the mid-1880s the Neptune yard prospered, launching the steel-hulled *Alfonso XII* for the Spanish Compañia Transatlantica in 1888, the largest non-warship built on the Tyne at that date. The yard built a number of Italian emigrant ships for the crossing from the Italian ports to South America, and in 1889 it launched its first refrigerated ship. By 1898, when the north yard was added, the firm had a workforce of 2000 and the capacity for 30,000 tons of shipping. In 1899 the company built the engines and boilers for the Russian ice-breaker *Angara*, which had to be transported out to Lake Baikal for fitting, and in 1902 it launched the 500 foot *Colonia*, a cable ship carrying 4000 miles of cable built for the Telegraph and Maintenance Company Ltd.

In 1899 a limited liability company, Wigham Richardson & Co. Ltd, was formed, with Richardson as chairman, and in 1903 the company amalgamated with Swan, Hunter of Wallsend to become Swan, Hunter, and Wigham Richardson Ltd, the largest merchant shipbuilding concern on the Tyne, which survived until nationalization of the shipbuilding industry in 1977. Richardson became vice-chairman of the new company. Later in 1903 the company bought the Tyne Pontoons and Dry Dock Company to give 4000 feet of continuous frontage along the Tyne.

Richardson was influential in the development of the shipbuilding industry in the north-east. As a result of his pamphlet *Lloyd's Register of Shipping: its Effect ... upon the Art of Shipbuilding* (1874), the rules of

Lloyd's Register were modified. He was one of those who founded the journal *Shipping World* in Newcastle in 1882, and he was its first chairman. A founder member of the North East Coast Institution of Engineers and Shipbuilders in 1884, he served as president in 1890–92 and was a member of the North of England Institute of Mining Engineers and the Institution of Naval Architects, regularly contributing papers to all of these. He was a director of the Walker and Wallsend Union Gas Company, and of the Tyne Pontoons and Dry Dock Company, and he was one of the first subscribers to the Tyneside Tramways and Tramroads Company, which opened in 1902. Richardson was widely read and cultured. He liked to write Latin verses, and in the 1880s he held a series of evenings reading and translating the works of Virgil with a group of friends including the shipbuilder Sir Benjamin Chapman Browne and the banker Thomas Hodgkin. His interests included political economy and sociology, military and naval history, architecture—he designed a number of houses—and chess, and he became an expert on the construction of sundials, contributing an appendix to a new edition of Mrs Alfred Gatty's *Book of Sun-Dials* (1889). Richardson died suddenly on 15 April 1908 following an operation.

Sir Archibald Denny

Denny began his apprenticeship in the shipbuilding department of the family business of William Denny & Brothers, during which time he qualified for entry to the Royal Naval College, Greenwich, where for three years he combined the academic study of naval architecture with the practical training of the shipyard. After which he served for a time at Liverpool office of Lloyd's Register before becoming a partner in his father's firm in 1883. He assumed responsibility for the technical side of the undertaking. He was involved in the development of the ship model experiment tank at the Leven shipyard, which commenced operation in 1883 as the world's first hydromechanics laboratory set up by a commercial shipyard.

Denny became best known for the leadership which took the shipyard to a position recognized worldwide as second to none for technical excellence. The yard produced high-quality ships, many of which were destined for the high-speed and cross-channel routes. In 1901 it delivered the pioneer passenger turbine steamer *King Edward* using its vast experience coupled with the knowledge gained from research and experimentation in the ship model tank. Denny was consulted regularly by government departments and other interests, he played a prominent part in the council of the Institution of Naval Architects, and for many years was chairman of the technical committee of the British Corporation Register of Shipping, the Glasgow-based rival to Lloyd's Register of Shipping. He chaired the British Engineering Standards Institution for nine years, the Board of Trade committee on the subdivision of ships from 1920 to 1924, the *Titanic* disaster investigation committee (1912–15), and the International Conference on the Safety of Life at Sea. He served on many

government and official commissions and committees, either as chairman or as a committee member. He was elected a fellow of the Royal Society of Edinburgh in 1894, but recognition by his peers took the form of election as president of the Institution of Engineers and Shipbuilders in Scotland, for the sessions 1903–5. In 1921 he took up residence in London and for the remaining fifteen years of his life represented the shipyard interests in the City. He died in London on 29 May 1936.

Sir James Laing

For many years James Laing was a member of the board of Lloyd's Register, as well as being on the council of the Institution of Naval Architects and of other technical societies.

Sir George Burton Hunter

Hunter was involved in the wider affairs of the shipbuilding industry. He was one of the founders, in 1884, of the North East Coast Institution of Engineers and Shipbuilders. He served from 1900 to 1924 on the council of the Institution of Naval Architects and he was their representative on the technical committee of Lloyd's Register and the Merchant Shipping Advisory Committee. He was also a member of the Institution of Civil Engineers.

Sir James McFadyen McNeill

Shipbuilder, the youngest of three sons of Archibald McNeill, a shipyard foreman. McNeill's education began at Clydebank high school, from which a scholarship took him to Allan Glen's school in Glasgow, noted for its technical bias. In 1908 he started an apprenticeship at the shipyard of John Brown & Co. Ltd, Clydebank. Winning a Lloyd's Register scholarship in naval architecture in 1912, he undertook a sandwich course at the University of Glasgow, combining academic work with practical training in the shipyard, and graduated BSc in 1915 with special prizes in mathematics, naval architecture, and engineering. Having joined the Royal Naval Volunteer Reserve in 1911, McNeill transferred to the Officers' Training Corps at university, and on graduating was commissioned as a second lieutenant in the Royal Field Artillery Lowland brigade, proceeding to France in 1916. Promoted captain in 1917, he served with the 21st divisional artillery and was awarded the MC at Amiens (1918); then promoted major, he was mentioned in dispatches.

In 1919, McNeill returned to John Brown at Clydebank. He was assistant naval architect from 1922 until 1928, when he became principal naval architect and technical manager. During the inter-war years McNeill was responsible for the design of a wide variety of ships for different owners and trades, but the work which brought him his greatest acclaim was in the sphere of large passenger liners. As an apprentice he had seen the

construction of the *Aquitania* and, in the period after the First World War, he shared in the planning of liners for Canadian Pacific Steamships, New Zealand Shipping Co., Union Castle Line, and other leading companies. He is best remembered for his collaboration with the Cunard Company in the production for their north Atlantic service of the *Queen Mary* and the *Queen Elizabeth*, which went into service in 1936 and 1940 respectively. The considerable advance in size and speed of the *Queen Mary* presented problems in design and construction, which were successfully resolved under McNeill's assiduous and skilful guidance. Not least of these was the launching of such a large ship in the restricted waters of the River Clyde, and its accomplishment in 1934 was the subject of a classic paper delivered by McNeill to the Institution of Naval Architects in 1935. The respect in which McNeill was held by owners and subcontractors alike was matched by his relations with senior Admiralty officials. They valued greatly his opinions and co-operation, especially during the Second World War, when the Clydebank yard made a singular contribution to naval building.

In 1948 McNeill assumed the office of managing director and in 1953, when the Clydebank works became a separate company in the John Brown Group, he was appointed managing director and deputy chairman. The completion of the Royal Yacht *Britannia* in 1954 brought him his appointment as KCVO. He had already been created CBE in 1950. He retired from executive duties in 1959, and relinquished the deputy chairmanship in 1962.

In addition to his Clydebank posts, McNeill held at various times directorships in the Firth of Clyde Dry Dock Company Ltd, the Rivet, Bolt and Nut Company, the North West Rivet, Bolt and Nut Company Ltd, and the British Linen Bank. His attainments were recognized by his university in 1939 when it conferred on him the honorary degree of LL.D. He also greatly prized the fellowship of the Royal Society (1948). In 1950 the Royal Society of Arts named him Royal Designer for Industry. His native town made him a burghess of the burgh of Clydebank. McNeill's concern for the technical institutions of his profession led him to serve as a vice-president of the Institution of Naval Architects, and as president of the Institution of Engineers and Shipbuilders in Scotland (1947–9). In 1956–7 he was chairman of the standing committee of the Association of West European Shipbuilders. In addition he was president of the Shipbuilding Conference (1956–8). He was a member of the general and technical committees of Lloyd's Register of Shipping, and of the court of assistants of the Worshipful Company of Shipwrights. McNeill had an integrity of purpose and the determination and drive to attain his objectives, coupled with a modesty of manner, which disguised his underlying ability. McNeill died in Canniesburn Auxiliary Hospital, Bearsden, Glasgow, on 24 July 1964.