

Mr. Price was a Fellow of the Surveyors' Institution, and was connected with various municipal societies. He also served the office of president of the Birmingham Association of Students of The Institution, taking great interest in the welfare of the younger members of the profession.

He was elected an Associate Member of The Institution on the 2nd December, 1879, and was transferred to the class of Members on the 7th December, 1897.

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SIR EDWARD JAMES REED, K.C.B., F.R.S., died on the 30th November, 1906, in his seventy-seventh year. He was born at Sheerness in the year 1830, and commenced his practical training in the Royal Dockyard at that place. He afterwards passed through the School of Mathematics and Naval Construction in Portsmouth Dockyard, and next received a subordinate appointment at Sheerness. He left the Admiralty service in 1852, and became assistant editor of the *Mechanic's Magazine*. He was one of the most active promoters of the Institution of Naval Architects, which was founded in January, 1860, and acted as Secretary of that Institution during the first three years of its existence. In July, 1863, he was appointed Chief Constructor of the Navy. This appointment followed upon proposals he had made some time before for improving the design of ironclad ships. Sir Edward Reed proposed a radical change of design as compared with the earliest ironclads of the "Warrior" and "Minotaur" classes, limiting the armoured portion of the hull to what was merely sufficient for the proper protection of its vital parts, such as the compartments containing the boilers, machinery and magazines, the gun battery, the rudder-head and steering-gear, and the water-line area before and abaft the gun battery. This became well known as the "belt and battery" system, and is, in general principle, the system adopted in the design of battleships and armoured cruisers to-day. The wooden ships "Enterprise," "Favourite," and "Research" were ordered by the Admiralty to be converted in accordance with Sir Edward Reed's proposals in 1862, and the design of the "Bellerophon" followed immediately after he took office in 1863. The last-named was the first of a series of historical ships that led in direct line to the last British armour-clads which fought their guns upon the broadside; while the "Devastation," the last battleship designed at the Admiralty by Sir Edward Reed, is the first in the long list of sea-going battleships, the heaviest guns

of which are placed in revolving turrets on deck. The design of the structure of the hull in the "Bellerophon" was novel and ingenious, and it has been followed, in principle, in the later battleships and cruisers of the British Navy, and adopted all over the world.

Sir Edward Reed resigned the Chief-Constructorship of the Navy in July, 1870, and after leaving the Admiralty, he practised as a naval architect till his death. He designed some famous warships for the German, Japanese, Chilian and other foreign navies, notably the fast battleships, "Libertad" and "Constitucion" for the Chilian navy, which were purchased by the British Government while under construction, and are now known as the "Triumph" and "Swiftsure." He was also consulting naval architect to the Indian Government and to the Crown Colonies, and designed and superintended the construction of many vessels for those services.

He was always a strenuous advocate of scientific and technical education, and did much when Chief Constructor of the Navy to influence the Admiralty in establishing the Royal School of Naval Architecture and Marine Engineering at South Kensington in 1864, to which many of the leading naval architects and marine engineers of the present day owe their scientific training. It was also owing to his intelligent appreciation of the value of the late Mr. William Froude's early model-experiments upon the resistance and propulsion of ships, and his favourable recommendation to the Admiralty, that this method of estimating speed and power and of determining the most suitable forms of hull was first applied to the improvement of the ships of the Navy and that the invaluable services of Mr. Froude were obtained for this important work.

In 1873 Sir Edward (then Mr.) Reed contested unsuccessfully the Borough of Hull at a Parliamentary election. He was returned for the Pembroke Boroughs in 1874 and for Cardiff in 1880, and sat continuously in the House of Commons from 1874 to 1895, and from 1900 until 1905, when he retired from Parliamentary life. He was made a C.B. in 1868 and K.C.B. in 1880, and served as a member, and sometimes as chairman, of many important committees. He was chairman of the Load-line Committee of 1884, which first made legislation for regulating the depth of loading of ships successful in practice, and of the Manning of Ships Committee of 1894. He was also appointed Government Commissioner to investigate the cause of capsizing of the "Daphne" in the Clyde in 1883, and he was one of the Lords of the Treasury in Mr. Gladstone's Government of 1886.

Sir Edward Reed was elected a Fellow of the Royal Society in 1876. He served upon the council of the Institution of Naval

Architects from 1863, when he retired from the secretaryship, until his death. In 1885 he delivered before The Institution of Civil Engineers one of a special series of lectures, taking for his subject the "Forms of Ships." Among his published works are: "Ship-building in Iron and Steel," 1869; "Our Ironclad Ships," 1870; "The Stability of Ships," 1884, and "Modern Ships of War" (in collaboration with Admiral Simpson), 1885. He was also a frequent and valued contributor to the proceedings of the leading scientific and technical societies. He was the proprietor and editor of the quarterly magazine *Naval Science* from 1872 to 1875, and contributed many articles to its pages.

He was elected a Member of The Institution on the 1st March, 1870, and served on the Council from 1883 to 1896.

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JAMES ROWAN, born in Glasgow on the 18th March, 1854, was the son of the late Mr. David Rowan, founder of the marine engineering firm of David Rowan and Company, of that city. The subject of this notice was educated at the Glasgow Academy and at Glasgow University, and subsequently served an apprenticeship of 5 years in his father's works. In 1880, when 26 years of age, he became Assistant Manager of the works, and 5 years later was made partner with his father. In 1888 he took over complete control of the business, of which he retained the active direction until his death. The dispute which arose in the engineering trade in 1897, and in which Mr. Rowan's firm was involved, directed his attention to economic questions, and led to his undertaking a thorough investigation into the methods and details of administration and the remuneration of labour. The result of his enquiry was a careful reorganization of the works in respect of equipment and methods of management, in which his organizing ability and sound practical common-sense found full scope. After a trial of the premium system of remuneration as originally devised, he set to work to eliminate the defects which in practice rendered that system unpopular with workmen, and the improved system, with which his name is associated, has since been widely adopted and developed. His Paper on works organization and the remuneration of labour, contributed to the Engineering Conference at Glasgow in 1901, attracted much attention at that gathering and evoked an interesting discussion.

In many organizations connected with engineering Mr. Rowan took