

His labours were incessant, and even for one of his remarkable capacity, exceptionally severe; but he was not destined to see their final fruition. History must record his last great services to his country.

Lord Kitchener was elected an Honorary Member of The Institution on the 2nd February, 1904, on account of his services "as a soldier in Egypt, the Soudan and South Africa, and for the remarkable work done by him as a Military Engineer."

Sir ANDREW NOBLE, *Bart.*, Captain R.A., *ret.*, K.C.B., D.Sc. (*Oxon.* and *Cantab.*), D.C.L. (*Durham*), F.R.S., Chairman of Sir W. G. Armstrong, Whitworth and Company, Limited, died at his residence, Ardkinglas, Argyllshire, on the 22nd October, 1915, aged 84. For the past 55 years he had been identified with the Elswick Works, and was largely responsible for their organization and the world-wide expansion of the business, besides contributing in no small degree, by his researches and inventions, to the high scientific reputation which it has acquired.

Born at Greenock on the 13th September, 1831, Andrew Noble was educated at Edinburgh and the Royal Military Academy, Woolwich. In 1849 he entered the Royal Artillery, attaining the rank of Captain in 1855. He was first employed on the staff of the Magnetic Survey at the Cape, and on his return to this country, was appointed Secretary of the Royal Artillery Institution. In 1858 he became Secretary to the Committee on Rifled Cannon and in 1859 to that on Plates and Guns. In this year also he became Assistant-Inspector of Artillery at Woolwich, and in the following year he joined the Ordnance Select Committee and also the Committee on Explosives, serving on the latter continuously for 20 years until its dissolution in 1880.

In 1860, Sir William (afterwards Lord) Armstrong, who had been brought into contact with Captain Noble in connection with the methods devised by him to test the new Armstrong guns, induced him to relinquish the public service for the direction of the Ordnance department at Elswick, and subsequently acquiring an interest in the business, he began at 30 his life-long association with the Elswick firm. In the course of the long series of experiments which, continued over 50 years, contributed so materially to the development of the science of gunnery, he investigated the phenomena attendant on the firing of large guns, carried out experiments in electroballistics, invented the Noble chronoscope, and made numerous researches in "Fired Gunpowder" and on the properties of cordite and ballistite. Some of this work is described in the collected Papers published in 1906 under the title of "Artillery and Explosives." For his services to military science he was made a C.B. in 1881 and K.C.B. in 1893: in 1902 he received a baronetcy. He was a member of many foreign Orders and was honoured by several universities and scientific societies. He was elected a Fellow of the Royal Society in 1870 and in 1880 received the Royal medal in recognition of his researches on

explosives. He married, in 1854, Margery Durham, daughter of Mr. Archibald Campbell of Quebec, by whom he had four sons and two daughters, and was succeeded in the baronetcy by his eldest son, Major George Noble.

Sir Andrew Noble was elected a Member of The Institution on the 6th December, 1881. Between 1894 and 1899 and again in 1905-6 he served on the Council, and on the 3rd March, 1908, he was elected an Honorary Member "on account of the valuable services which he has rendered to engineering by his scientific researches and practical achievements in matters relating to explosives and the construction of artillery."

WILLIAM STEWART BECHER, B.A.I. (*Dubl.*), born at Skibbereen, Co. Cork, on the 24th July, 1869, died on the 30th July, 1916, of wounds received in action in France. On completing his practical training under the late Mr. James Mansergh, Past-President, he was engaged from 1896 to 1906 under Mr. G. N. Yourdi, M. Inst. C.E., the Resident Engineer, on various works for the Birmingham Corporation water-supply. In 1907 he was appointed Resident Engineer, under Messrs. G. H. Hill and Sons, Engineers, on the Ystradfellte Reservoir for the Neath water-supply. On the outbreak of war he joined the Sportsman's Battalion. He was elected an Associate Member on the 10th January, 1899, and was transferred to the class of Members on the 21st April, 1916.

WALTER BEER, born on the 4th June, 1874, lost his life in the "Persia," which was sunk in the Mediterranean on the 30th December, 1915. On completing his training, he served on the Great Western Railway, and with Messrs. Maxwell and Tuke, Manchester, designing the New Brighton tower. From 1897 until his untimely death he practised as a consulting engineer at Westminster, and was engaged in the design and construction of electric railways, tramways, waterworks and other undertakings, at Ilford, Barking, Lowestoft and other places. He was Engineer for the Newburgh and North Fife Railway, assisted the Royal Commission on London traffic, and was associated with numerous Bills in Parliament, with extensive railway contracts in South America, and with hutments in France, besides reporting on many other engineering enterprises. He was elected an Associate Member on the 5th December, 1899, and was transferred to the class of Members on the 20th April, 1909.

CHARLES JAMES BOWSTEAD, born in London on the 7th August, 1846, died at Chalford, Gloucestershire, on the 26th April, 1916. After gaining experience on the North Eastern Railway, he went out in 1873 to India as a Resident Engineer on the construction of the Great Southern of India (now South Indian) Railway. Subsequently he became a Resident Engineer on the Madras Railway. Before retiring to his home in Gloucestershire,