

he received a Telford medal. He also wrote in 1895 a book on "Plate Girder Railway Bridges."

Sir Maurice frequently contributed to the discussions at Institution Meetings. Always interesting and valuable, as the fruits of his wide knowledge and experience, these contributions to debates were rendered still more attractive by his gifts of lucidity, fluency, and humour. In 1919 he was elected a Fellow of the Royal Society; and the American Society of Civil Engineers, the Society of Engineers, and the Royal Engineers' Institution elected him to honorary membership, while the University of Birmingham conferred upon him the honorary degree of LL.D.

He rendered valuable services on numerous Committees and Commissions, particularly during the war. He was a member of the Commission to inquire into the collapse of the Quebec bridge, and served on the Royal Commission on Fire Prevention, and the International Technical Commission of the Suez Canal. From 1912 to 1919 he was Chairman of the Advisory Committee of the Admiralty on Naval Works, and during the whole of the war was Chairman of the War Office Committee on Civilian Labour on London Defences. He twice visited the front in France to advise on the question of drainage, and from 1915 to 1918 served on the Huttet Camps Committee of the War Office. He was Chairman of the Treasury Committee on Aerodrome Accounts in 1919; from 1917 to 1919, Chairman of the Canal Control Committee of the Board of Trade; and during 1918-19, Chairman of the Nile Projects Committee of the Foreign Office. He was a member of the Advisory Council of the Department of Scientific and Industrial Research, and served from 1915 to 1921 on the Advisory Council of the Science Museum. For many years he was an officer of the Engineers and Railway Staff Corps, of which he was, at the time of his death, Colonel-Commandant.

He married in 1911, Ida, daughter of Colonel E. Dickinson, R.E., of Midhurst, by whom he had two daughters.

Sir Maurice took a very active interest in The Institution and its affairs, and spared no personal effort to promote its welfare and that of the engineering profession generally. By the untimely close of his distinguished career, the Institution suffered a heavy loss, and his many friends were bereft of one whom the President, in referring to his death, at the Meeting on the 19th November, characterized as a "great engineer, a great man, and, in the highest sense of the word, a great gentleman."

SIR GUILFORD LINDSEY MOLESWORTH, K.C.I.E., Past-President, a son of the Reverend J. E. N. Molesworth, D.D., was born at Millbrook, near Southampton, on the 3rd May, 1828. He was educated at King's School, Canterbury, until 1840, and after that date at Manchester Grammar School, which he left at the age of 16 to enter the Civil Engineering College at Putney. On the completion of his college course he was engaged by Mr. R. B. Dockray, M. Inst. C.E., Chief Engineer of the London and Birmingham

Railway, on the widening of that line near Watford, receiving the appointment of Assistant Engineer; and later was employed as assistant to Mr. Henry Warriner on the construction of a branch line in Buckinghamshire. His father then arranged for him to serve an apprenticeship of two years in the works of Sir William Fairbairn, M. Inst. C.E.—training to which Sir Guilford, in after life, attached the greatest importance.

He was appointed in 1849 Chief Assistant to Mr. W. T. Doyne, M. Inst. C.E., and was engaged in this capacity for two years on railway work in South Wales. In 1851 he became Chief Assistant Engineer on the London, Brighton and South Coast Railway, constructing a fourth line of railway between London and Croydon. The outbreak of the Crimean war necessitated the erection of new munition factories at Woolwich, and, on the recommendation of Sir Wm. Fairbairn, he was, in 1854, appointed engineer for their design. After leaving Woolwich, he engaged in 1855 upon a consulting practice with Mr. Horner, who had been Sir Wm. Fairbairn's chief draughtsman; on Mr. Horner's retirement, he entered into partnership with Mr. Edmund Edwards—another associate in Sir Wm. Fairbairn's works.

He left England in 1859 to assume the appointment of Mechanical and Locomotive Superintendent to the Ceylon Railway, on the recommendation of Mr. Doyne, who was then Chief Engineer of that system. Various difficulties arose in connection with the proposed Colombo-Kandy railway, and, during Mr. Doyne's absence in England to seek advice on these matters, Sir Guilford made a new survey and revised the location. The Railway System, however, was transferred to the Government, and Sir Guilford left the country in 1861. After his return to England, Mr. W. G. Smart, M. Inst. C.E., Chief Engineer of the Madras Railway, reported favourably on his revised location of the Colombo-Kandy line, and in 1863 the Ceylon Government appointed Sir Guilford Chief Engineer for its construction. He became subsequently Director-General of Railways, and also Director of Public Works, in which capacity he restored the irrigation system of the island and improved the roads, at the same time reducing the cost of maintenance.

He left Ceylon in 1871 to become, on the recommendation of Sir Charles Gregory, Past-President Inst. C.E., Consulting Engineer for State Railways in India. He strongly opposed the metre gauge, and his opinion was supported when the exigencies of the Afghan campaign necessitated the conversion to broad gauge of 1,000 miles of metre-gauge track. Although he reached in 1883 the age at which compulsory retirement was enforced, he was granted a special extension, eventually retiring in 1888. During his period of office, nearly 4,000 miles of State Railways were authorized, and nearly 3,500 miles were opened. In recognition of his services to India, he was made a Knight Commander of the Indian Empire in 1888; he also received the Burma War and Afghan medals.

After returning to England, he carried on a consulting practice.

He advised the Imperial British East Africa Company in 1891 on the route of a railway (now the Uganda Railway) from the east coast to Lake Victoria Nyanza; and in 1898, at the age of 70, he inspected, at the request of the Foreign Office, the completed portion, travelling mostly by bicycle or on foot. On the conclusion of his year of office as President of The Institution, he retired definitely, in 1905, from active professional work. At the outbreak of war in 1914 he was accepted for volunteer home-defence services, having been always keenly interested in volunteer activities. Relinquishing this on medical advice, in 1915 he offered his services as a mechanic in Messrs. Vickers's munition works at Crayford, but was persuaded that he would be more useful in the estimating department, where he remained for nearly five months, until it was vetoed by the doctor.

He was elected an Associate Member of The Institution in 1854, was transferred to the class of Members in 1862, became a Member of Council in 1891, and occupied the Presidential Chair during the Session 1904-5. In 1857 he contributed to the Proceedings a Paper on "Conversion of Wood by Machinery,"¹ for which he was awarded a Watt medal and Manby premium. His Presidential Address dealt with the Public Works of India and Ceylon, particularly the resources of those countries, and questions of management and future policy.

He advocated, both in India and Ceylon, that improvements and extensions necessary in the development of railways should be paid for out of revenue, instead of by adding to the capital expenditure. For many years he urged the adoption of the decimal system of currency in Ceylon, and, before he left, was able to see it in use. He was strongly in favour of bimetallism, and was a delegate for the Government of India at the Brussels Monetary Conference in 1893.

The "Pocket Book of Engineering Formulæ," which has rendered Sir Guilford's name a household word in the engineering world, was the outcome of a suggestion made to him by Mr. Dockray in 1849, that he should always carry a pocket book wherein to note suitable matters of engineering interest. When he returned to England from Ceylon in 1861 his notes had become voluminous, and he published them in the following year. Sir Guilford's writings were not confined to engineering subjects; and his "Reason and Instinct in Ants" and "Spiders, Spinnings, or Adventures in Insect Land," are evidence of his keen interest in other branches of Science.

He died at his residence, Manor House, Bexley, Kent, on the 21st January, 1925, at the advanced age of 96. He married, in 1854, Maria Elizabeth, daughter of Mr. J. T. Bridges, of St. Nicholas Court, Thanet. His wife died in 1918; and three sons, two of whom were civil engineers, and the third a major in the Royal Engineers, predeceased him. A fourth son, Mr. H. B. Molesworth, M. Inst. C.E., and two daughters survive him.

¹ Minutes of Proceedings Inst. C.E., vol. xvii, p. 17.