

continuously active life to within two years of his death, when ill-health forced his progressive retirement from many long-standing interests and directorships.

Sir John's widow has herself since died: he leaves a son and three daughters.

J.W.R.



William Hamilton Shortt

who was born on 28 September, 1881, died on 4 February, 1971.

Educated at Christ's College, Blackheath, he entered the engineering department of the London and South-Western Railway as an engineering Cadet in 1902 under J. W. Jacomb-Hood. In 1906 he was appointed Bridge Assistant to the then London District Engineer, A. W. Szlumper.

He won distinction both as a railway engineer and in the horological field with his invention of the Shortt Free Pendulum Clock, for many years the standard time-keeper at Greenwich Observatory. Apart from the years 1916-18, his engineering career

was devoted to the London and South-Western Railway (later the Southern Railway).

From 1908-10 he served as Secretary to a Sub-Committee of the Railway Engineers' Association on speed of trains round curves: during this period he devised the Shortt Speed Recorder, which by means of an electrically maintained tuning fork measured accurately the time taken for a train to pass a given distance along one rail. This device was later used by the Bridge Stress Committee of the DSIR (1923-27). Shortt presented two papers to the Institution on the subject, 'A practical method for improvement of existing railway curves', P. 176, p. 97, and 'A new method for the improvement of existing railway curves', SEP No. 3 (1923). The principles formulated in these papers still provide the basis for adjusting transition and circular curves on railways.

From 1910-12 he was Resident Engineer at Nine Elms on the construction of the locomotive running shed extension of the LSWR. When in 1914 A. W. Szlumper became Chief Engineer, Shortt was appointed Permanent Way Assistant: two years later he was released from his duties to serve in France with a commission in the Royal Engineers as a Field Company Officer, with the rank of Captain (temporary). In 1919 he resumed work as Permanent Way Assistant to the London and South-Western Railway's Chief Engineer.

In 1922 he became Acting District Engineer to the Western Division, LSWR, and in 1923 was appointed Divisional Engineer, based at Exeter. In this capacity he was responsible for track, bridges, tunnels, signals and earthworks from Salisbury to Devonshire and Cornwall, and for developing the first railway depot at Exmouth Junction for the manufacture of precast concrete products, varying from fence posts to station footbridges; the first

pre-cast concrete underbridge to be built on the Southern Railway was designed and constructed by Mr Shortt. He also enlarged a small quarry at Meldon, near Okehampton, for the blasting and crushing of stone for track ballast, which eventually became one of the biggest quarries in the country. He retired in 1946, after 44 years' service on the Railway.

Shortt won his spurs in railway research, but his activities extended to other fields. He designed various modifications to Bentley cars and in 1908, when he designed the Shortt Speed Recorder, became interested in precision horology. Collaboration with Mr F. Hope-Jones of the Synchronome Company culminated in 1921 in the installation by Mr Shortt of the first Shortt Free Pendulum Clock at Edinburgh Observatory. With accuracy of the order of a second a year, this clock was remarkable for its simplicity. As in the case of many great inventions, one wonders why it was not thought of before. Its performance set off a world-wide demand, to meet which 99 of these clocks were made in a simplified version to the same standard and used at Greenwich Observatory, the National Physical Laboratory, and similar observatories and laboratories throughout the world. Shortt traced the development of his Free Pendulum Clock in a paper presented to the British Horological Institute in May 1928,* and was awarded the Institute's Gold Medal in 1931. In 1954 he received the first Tompion Medal† from the Worshipful Company of Clock-makers (of which he was Master in 1950). For his contribution to the science of horology he also held the John Wetherell Silver Medal of the Franklin Institute.

Standard for some twenty years, his free pendulum clocks are now replaced by atomic clocks.

William Hamilton Shortt was a Fellow of the Permanent Way Institution and of the British Horological Institute.

Both as engineer and friend, he ranked high among his contemporaries. By nature gentle and retiring, he was fearless in technical discussion, and his sound and sometimes unconventional reasoning was not always welcomed by his superiors.

Elected to corporate membership in 1907, he was transferred to the senior grade in 1924.

He was predeceased by his wife, and is survived by three daughters.

* See the May and June 1929 issues of the *Horological Journal*.

† Awarded for the most outstanding achievements in the field of horology.