important policy changes arising out of the White Paper on Transport. He submitted his report before his retirement in April 1967.

Arthur Dean was made a CBE in 1961. He held a DIC and was a Fellow of the Permanent Way Institution, of which he was President in 1955 and 1956. A member of the Société des Ingénieurs Civils de France, he was on the Board of the Railway Benevolent Institution.

He gave devoted service to the Institution and was for 48 years on the Roll, serving on the Council from 1958–63. A member of the Railway Divisional Board from 1945–53, he was Chairman from 1959–62—in this last period also serving on the Library Committee. Although in addition a member of the Yorkshire Association and of the Education and Training Committee, he found time to present a number of papers to the Institution, one of which was awarded the Telford Premium (see under). At the Symposium on Railway Traffic Engineering in May 1967 he was subpoenaed to act as Chairman and summed up the proceedings.

After an operation in April 1968, which revealed an incurable condition, he showed remarkable spirit, pressing on with his normal activities as long as possible. Two months before his death he addressed an international meeting of railway engineers at Mainz. Friends and colleagues remember him with pride and affection as a dedicated railway engineer and a sympathetic friend. He was a man of immense energy and enthusiasm with a keen analytic brain.

Elected to corporate membership in 1928, he was transferred to the senior grade in 1942.

He is survived by his widow and a son.

*Author of:*

'The Repair of War Damage to Railway Way and Works in the London area, 1940 and 1941.' D (Railway), No. 2 (1941–42), 3. Discussion: 28. Awarded Telford Premium.

'The Design of Locomotive Sheds.' D (Railway), No. 44 (1951). Discussion: 34.

'Prestressed Concrete Bridges on British Railways.' CCE, May 1950, 8.

'Prestressed concrete applied to the construction of railway bridges and other works.' D (Railway), 44 (1951). Discussion: 34.

With Peter Chalmers and A. C. Layhe, 'The mechanization of railway engineering maintenance work'. P. 14 (Oct. 1959), 205. Discussion: P. 16 (June 1960) 209.

## **George Lyttleton Laurenson,** CBE

who was born on 13 October, 1893, died on 6 June, 1968.

He was educated at Lyttleton District High School and Wellington College (1899–1910), later attending courses at Wellington Technical College.

After four years' practical training with R. W. Holmes (F), Chief Engineer, New Zealand Public Works Department, he was engaged in 1914 on a survey of rough forest country for a 5-mile extension of North Auckland Main Train Railway, also estimating for earthworks and for 12 long bridges, culverts, station yards, etc. In 1915 he became Assistant Engineer on the construction of a section of the East Coast Railway. This included earthworks from Paingarva to Otamarakan, concrete culverts, timber and steel girder bridges, station buildings, etc.

In World War I Laurenson served from 1916–18 with the New Zealand Expeditionary Force, New Zealand Engineers. After giving instruction in bridge building at Trentham, he sailed for a 2-year spell in France, where he

was occupied in trench engineering, bridge and road construction, dugouts, gun emplacements, shelters and drainage.

He returned in 1919 to railway construction work and the following year became Assistant Engineer in the Public Works Department at Greymouth. In 1928 he was appointed Resident Harbour Engineer at Westport, transferring in 1930 to the New Zealand Government's Transport Department as a civil engineer. He became Assistant Commissioner in 1935 and Commissioner of Transport in July 1937.

During World War II he was appointed Oil Fuel Controller and Motor Vehicle Controller. He was also made an Honorary Colonel to take charge of transport organization in the event of invasion.

Laurenson retired from his post as Commissioner of Transport in July 1954, in which year, on the occasion of HM The Queen's visit to New Zealand, he was made a CBE.

He was an Associate Member of the New Zealand Institution of Engineers. At the time of his death he was a Serving Brother of the St John's Ambulance Association and an Elder in the Presbyterian Church. His recreations were trout-fishing and later, in his retirement, bowls.

Admitted a Student in 1916, he was elected to corporate membership in 1919—over 50 years on the Roll of the Institution.

He is survived by his widow, two sons and three daughters.

**Frederick William Waddell,** OBE, CEng

who was born on 4 February, 1903, died on 16 July, 1968.

Educated at Harris Academy, Dundee, he took his practical training from 1919–23 under J. H. Hannay Thompson (F), before joining the Dundee Harbour Trust, where Mr Thompson was General Manager and Engineer. For the next four years he was engaged as Assistant Engineer on harbour and dock construction, hydrological surveying and buoying, maintenance of roads, railways, etc.

Waddell was to specialize in works by direct labour on land drainage and heavy foundations, harbours and docks, finally becoming Chief Engineer to the Department of Agriculture and Fisheries for Scotland.

Leaving the Dundee Harbour Trust in 1927, he joined the Yorkshire Hennebique Contracting Company of Leeds, where he was put in charge of construction contracts for reinforced concrete coal bunkers at Dover Harbour, for a new timber wharf for a steel swing bridge at Newry, Northern Ireland and for reconstruction of a 400 ft quay wall at Dundalk, Eire, where he was also responsible for the construction of a new r.c. wharf.

The year 1930 proved a decisive point in his career. It was then that he joined the Department of Agriculture for Scotland (later to become the Department of Agriculture and Fisheries for Scotland) as Civil Engineer on field investigations and the design, under statutory powers, of arterial drainage schemes for rivers. For the Kelvin, Annan, Clyde and Almond Rivers he designed drainage schemes, as also for Machrihanish Water and Lochar Water.

In 1933 Waddell became Engineer-in-Charge of construction and repairs to harbours and piers in the North of Scotland: after reconstructing the main entrance to Helmsdale Harbour and a 270 ft quay wall at Scalloway, he extended several piers—at Dunbeath, Embo and John o'Groats—and constructed new