R. J. MEYER DISCUSSES

Locomotives That Have Crossed The Tasman

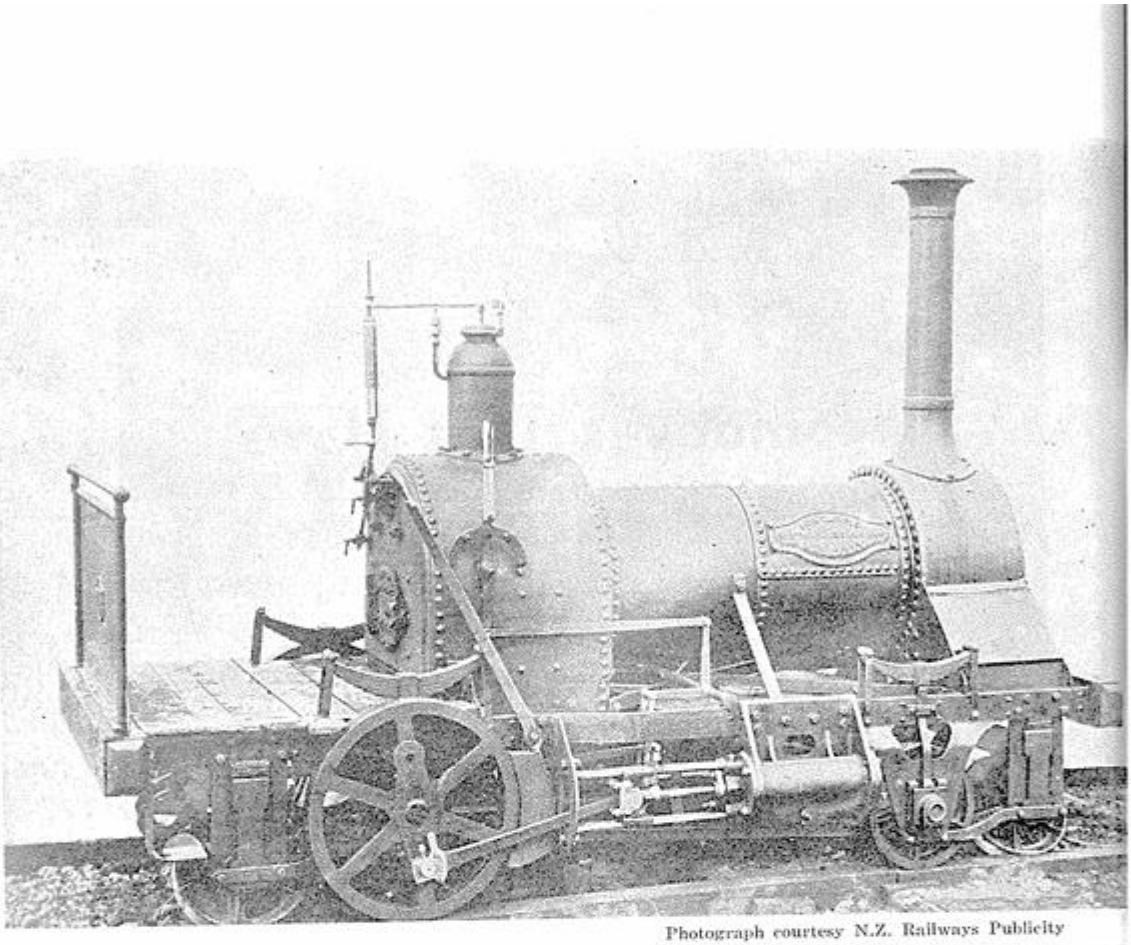
THE number of locomotives that have crossed the Tasman Sea on their way from Australia to New Zealand, or from New Zealand to Australia, and even excluding those that have come from farther afield, is quite surprising. And this two-way trade in locomotives is far from being of recent origin; it has been going on since 1863.

SOME came to New Zealand from Australia in very early times, but only to go back again when various provincial broad-gauge and standard-gauge systems were changed over to our standard 3ft.6in. gauge. Others came here for life, some came from Britain first but ended their days as far away as Perth, while a few were actually built in this country before crossing the sea.

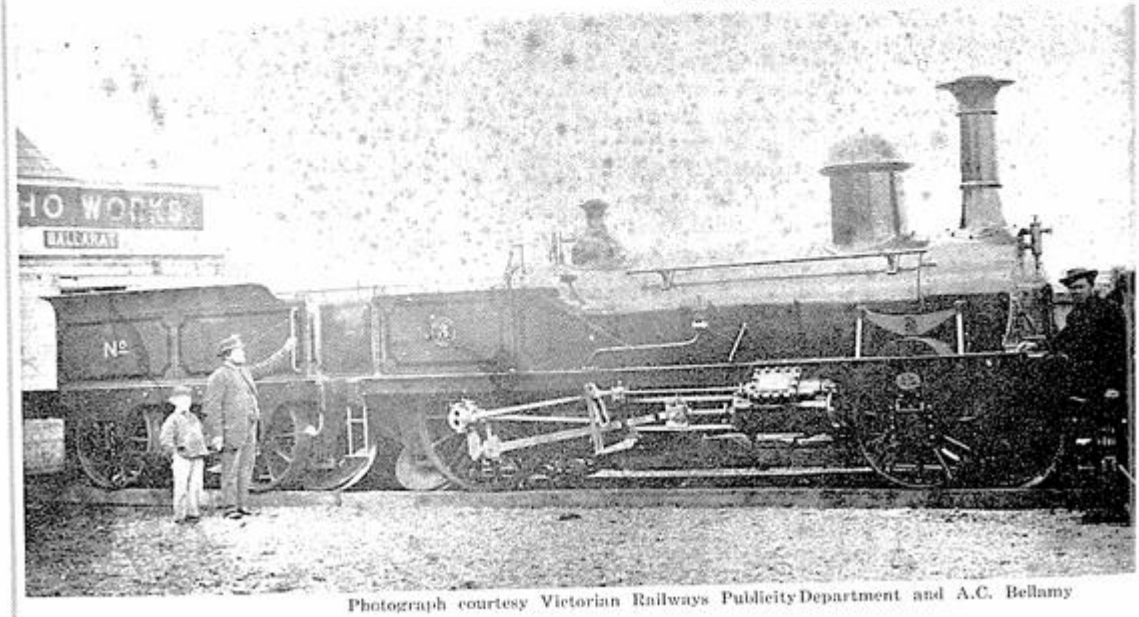
They were a mixed bag, these trans-Tasman locomotives, and they ranged from almost Heath Robinson-like contraptions to the present-day "Da"s and "Di"s of the main-line diesel fleet. This article is designed to bring part of their colourful story under one heading. Among the first to travel in an easterly direction, towards New Zealand, were three for the Oreti railway in Southland.

Southland's Wooden Railway

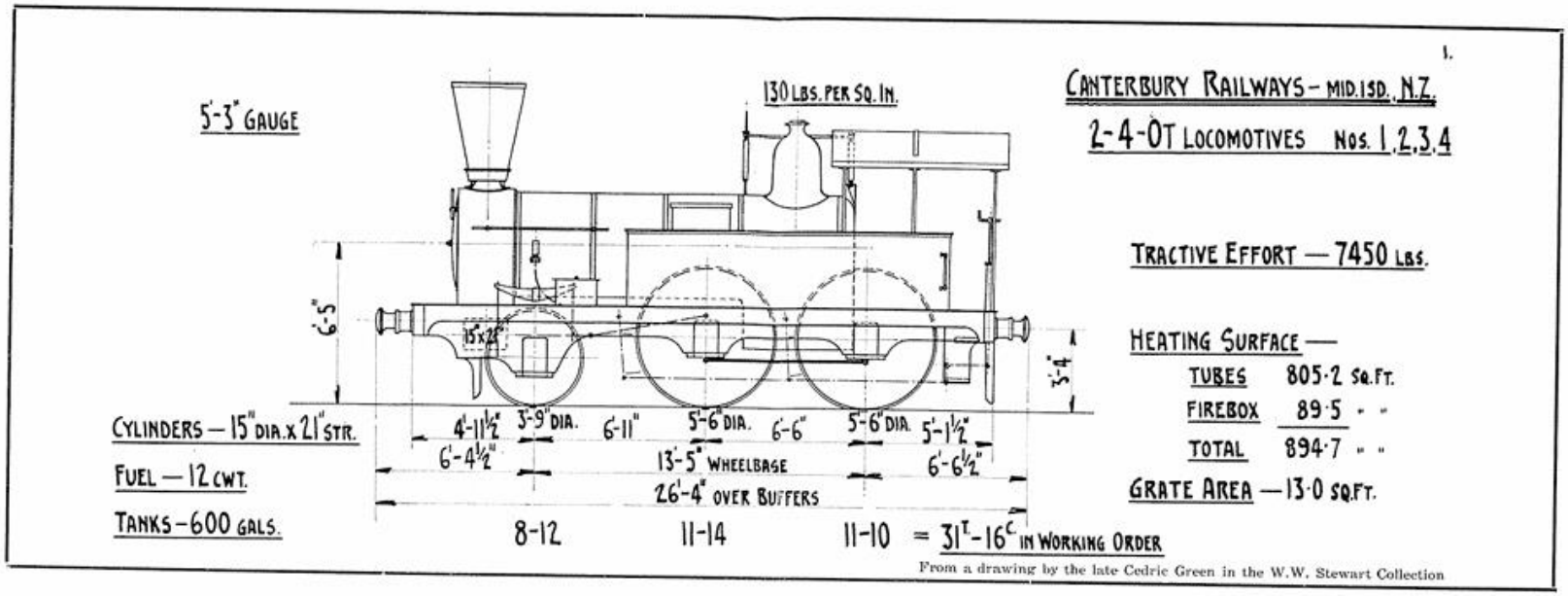
The Oreti Railway was the name given to a proposed line from Invercargill northwards to Winton, on the route to the goldfields. It was to be laid with wooden rails, following a demonstration of an 8-ton 2-2-0T locomotive called *Lady Barkly* at Invercargill on 8 August 1863. This locomotive, built at Hunt & Opie's Victoria Ironworks, Ballarat, Victoria, in 1861 to a gauge of 4ft.8½in., had worked successfully for two years at Green Hills near the Melbourne to Geelong line. It was brought to Invercargill by Mr J. R. Davies to demonstrate the practicability of steam traction on wooden rails, and was ultimately used on construction of the eight-mile railway to Makarewa, the only part of the Oreti Railway that was ever opened with wooden rails.



Photograph courtesy N.Z. Railways Publicity



Photograph courtesy Victorian Railways Publicity Department and A.C. Bellamy



From a drawing by the late Cedric Green in the W.W. Stewart Collection

LEFT, UPPER: Built at Ballarat, Victoria, by Hunt & Opie about 1861, this little 2-2-0 locomotive Lady Barkly was the first locomotive to work under steam in New Zealand. It was demonstrated on 8 August 1863 on the Invercargill jetty, where some wooden rails had been specially laid down.

LEFT, LOWER: Built in 1864 at the Soho Works of Robinson Thomas and Company, Ballarat, Victoria, locomotives Nos. 2 and 3 for the Invercargill and Makarewa wooden railway were unmistakably based on the classic Crampton design. Though each weighed only 13 tons without tender, they proved too heavy for the wooden rails, and did little work as locomotives.

The locomotive's wheels were flangeless, and were kept on the track by grooved wheels set at an angle to ride on the inner running edge of the wooden rails. It hauled trains on this line, but because of damage to the track, it was unsuccessful and was sold to an Invercargill sawmilling firm in the late 1860s, when it was converted for use on 3ft.6in. gauge track. By about 1886 it had been converted to a geared 0-4-0 with a two-wheel tender.

Southland's first locomotive has not been forgotten. Its name is perpetuated in that of a little wayside halt 22 miles north of Invercargill on the line to Kingston.

The other two locomotives for Southland's Oreti Railway were 2-2-0 Crampton-type locomotives with four-wheel tenders built by Robinson Thomas and Company at their Soho Works in Ballarat, Victoria. Evidently only one actually entered service on the Makarewa line as they too were hard on the track. Each weighed about 13 tons and measured 22 feet in length without the tender. The 54in. driving wheels were driven by 10½in. diameter outside cylinders, while the boiler pressure was 150 lb. per sq.in.

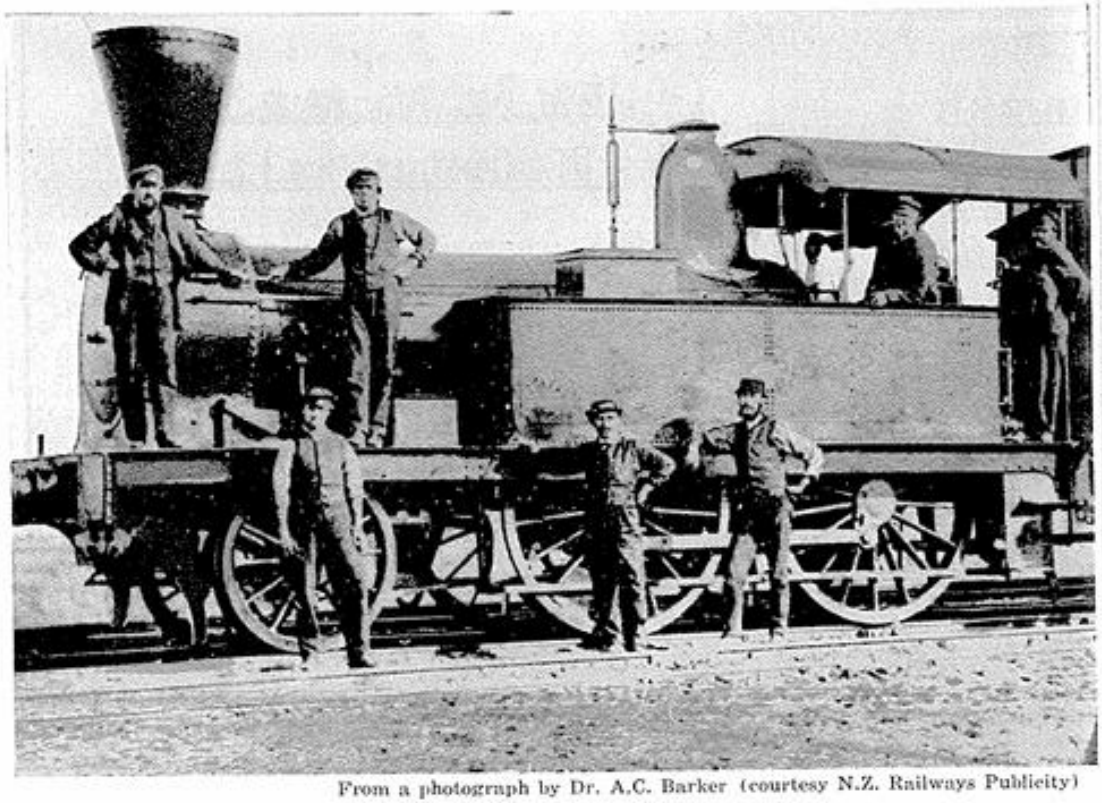
Both these locomotives were sold to sawmillers about 1869. One was converted for use as a stationary boiler at a Makarewa sawmill. In December 1873, with the aid of 20 bullocks, the other was moved from Hare & Pratt's mill in Dee Street, Invercargill, to the railway station, whence it was evidently railed to Sykes & Tulloch's sawmill at Makarewa. No more was heard of these locomotives.

Bluff Harbour and Invercargill Railway

Southland was not yet finished with railways for, even while the Oreti Railway debacle was taking place, a much more ambitious line, the Bluff Harbour and Invercargill Railway, was being laid with iron rails. For this line, Hudswell Clarke & Co. of Leeds, England, built two locomotives in 1864. Known as BH&IR Nos.1 and 2, and having maker's Nos.23 and 24, these 0-4-0 saddle-tank engines were capable of speeds up to 50 m.p.h. The two outside cylinders measured 12 inches in diameter and 18 inches in stroke, while the driving wheels, on a wheelbase of 7ft. 6in., were of 48 in. diameter. The tubes had a heating surface of 367 sq.ft., and the firebox 40 sq.ft. The grate area was 6.46 sq.ft. A pair of trailing wheels was added behind the firebox at a later date.

Number 3 was a 2-4-0T built by the Avonside Engine Company, Bristol, England, in 1866. The 60-inch diameter coupled wheels were driven from cylinders measuring 15in. by 22in.

With the conversion of the BH&IR and the north line, which had meanwhile been laid with iron rails and extended to Winton, to 3ft. 6in. gauge in 1875, these



From a photograph by Dr. A.C. Barker (courtesy N.Z. Railways Publicity)

Built in 1862 by Slaughter, Gruning & Co., Bristol, England, for the Melbourne & Essendon Railway Co., Victoria, this 32-ton 2-4-0T locomotive was brought to New Zealand by Holmes and Co., contractors for the Lyttelton and Christchurch Railway. It was landed at Ferrymead on 6 May 1962, was christened *Pilgrim*, and became Canterbury Railways locomotive No.1.

three locomotives were sold to the New South Wales Government Railways in 1876, but the barque *Cezarewitch*, which left Bluff on 8 June 1876 with these locomotives as part of the cargo, was wrecked at Big Bay, South Westland, about three weeks later. All the cargo was lost.

Canterbury Railways

The Canterbury Provincial Government adopted a broad 5ft.3in. gauge for its railways, and ran its first train between Christchurch and Ferrymead Wharf on 1 December 1863. Ten locomotives ultimately comprised the fleet of iron horses that served the Canterbury broad-gauge system until conversion to the national gauge of 3 feet 6 inches was completed in December 1877. They were then sold to the South Australian Government Railways, but suffered shipwreck en route when the fully rigged ship *Hydrabad* went ashore on Waitarere Beach near Levin during a gale on 24 June 1878. Fortunately the locomotives were among the cargo salvaged. After being landed on Kapiti Island, they were transferred to the *Bulwark*, *Greyhound*, *Glenelg*, *Matilda*, and *Ridge Park* for conveyance to their destination.

The following short accounts of the life of each locomotive are arranged in the order of the numbers allocated by the Canterbury Provincial Railways. In the South Australian notes, the years shown are those ending on 30 June in each instance.

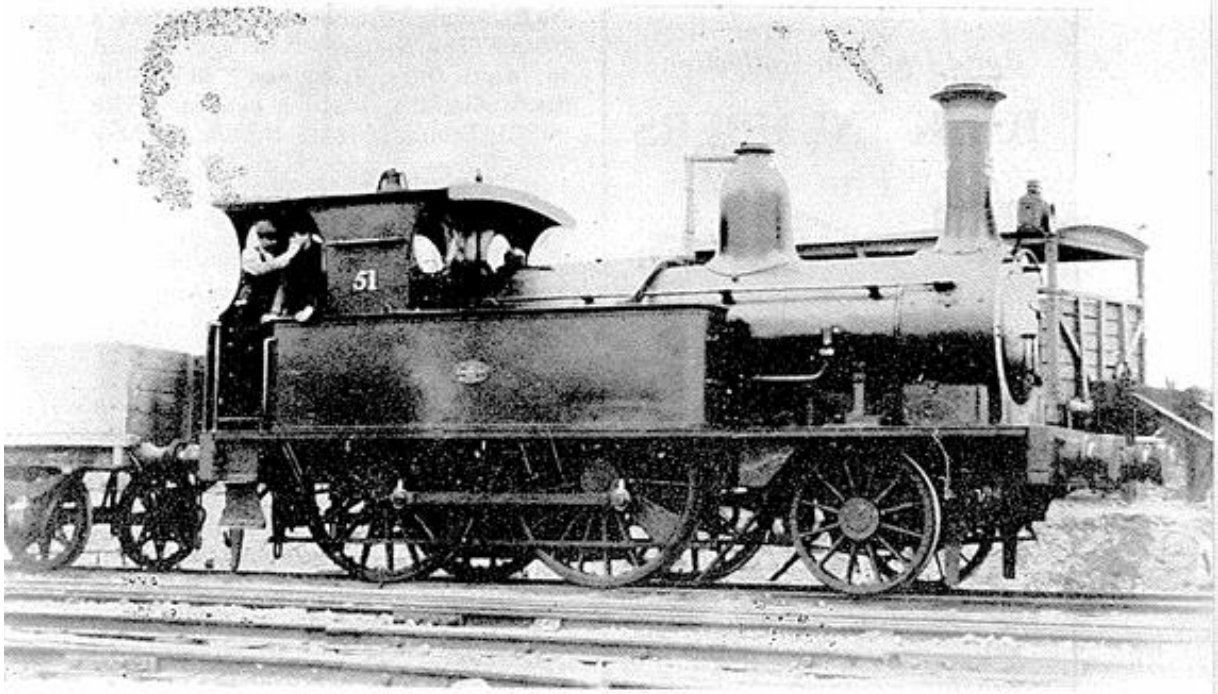
No.1 A 2-4-0T built by Slaughter, Gruning & Co., Bristol, England, No.448. Originally intended for the Melbourne and

From the W.W. Stewart Collection (courtesy N.Z. Railways Publicity)

South Australian Railways' 0-4-2T locomotive "M" 43 decorated in 1901 to haul the Royal Train carrying the Duke and Duchess of Cornwall (later King George V and Queen Mary) to Port Adelaide. It was originally Canterbury Railways' locomotive No. 8.

Essendon Railway Company, but sold unused to the Canterbury Public Works through the contractors, Holmes & Co., it arrived in New Zealand in April 1863. Only the frames and wheels were sold to the South Australian Railways. These were incorporated in a locomotive, No.56, with Adelaide Locomotive Works number B-1, using parts of S.A.R. No.2 to make a tender locomotive of class "EZ". It was in service by 27 May 1882, and was condemned on 12 December 1904. It was known as an "EZ" right up to 1886, dropped the "Z" for two years, picked it up again in 1889, together with another "E" from the Melbourne and Essendon Railway, to remain "EZ" up to 1891. The last letter was finally discarded in 1892.

No.2 A 2-4-0T, Slaughter, Gruning and Company's No.532, it arrived in New Zealand in April 1864. In South Australia, it



From the W.W. Stewart Collection (courtesy N.Z. Railways Publicity)

This "E" class 2-4-0T locomotive of South Australian Railways, No.51, was originally Canterbury Railways' No.2. The "straight-shooter" copper-capped funnel is typical of Canterbury Provincial locomotives. No.1 was the only one fitted with a conical funnel.

entered service on 16 December 1881 as "E" 51. Rebuilt in August 1884, it was the longest-lived of all Canterbury Railways locomotives, as it was not condemned until 8 April 1929.

No.3 Another Slaughter, Gruning 2-4-0T, their No.699, it arrived in New Zealand in March 1867. It was the first engine to pass through the Lyttelton Tunnel. In service in South Australia as "E" 50 by 12 January 1882, it was condemned on 17 October 1900.

No.4 A 2-4-0T, the Avonside Engine Company's No.742, it arrived in New Zealand in May 1868. It was the first locomotive to be landed at Lyttelton, the others having had to be transhipped to Ferrymead. In South Australia, it entered service as "E" 42 on 1 April 1880 but was renumbered "E" 49 that same year. Rebuilt in November 1885 and classed as "EZ" in 1885-1886, it was scrapped in 1929.

No.5 An Avonside 0-4-2 well-tank with maker's No.740, it arrived in New Zealand in May 1868. It entered service in South Australia as "M" 44 by 23 December 1880, was rebuilt in May 1888, withdrawn on 29 April 1916, and scrapped in 1922.

No.6 Another 0-4-2 well-tank by Avonside, maker's No.741, it also arrived in New Zealand in May 1868. It became "M" 46 in South Australia, where it entered service on 4 April 1881. It was withdrawn on 2 February 1917, and scrapped in 1922.

No.7 A 0-4-2T from the Avonside Engine Company, their No.855, it arrived in New Zealand in August 1872. In South Australia, it was "M" 45, entering service on 11 May 1881. It was rebuilt in August 1888, withdrawn on 3 February 1917, and scrapped in 1922.

No.8 Another Avonside 0-4-2T, maker's No.964. This one arrived in New Zealand in March 1874. It became "M" 43 in South Australia, where it entered service on 21 February 1881. Rebuilt in May 1888, it was withdrawn on 28 February 1913, and scrapped in 1922.

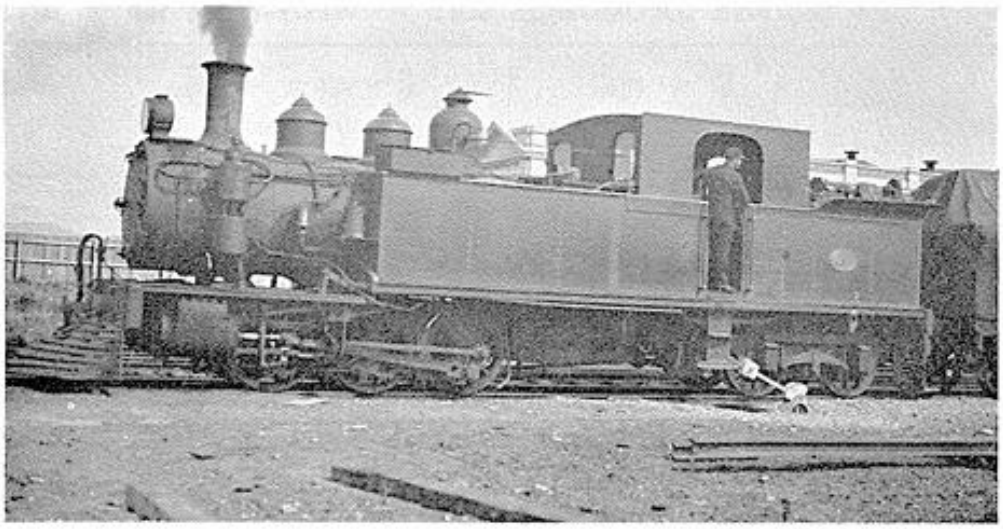
No.9 This 0-4-0T by Neilson and Company, Glasgow, Scotland, maker's No.1798, arrived in New Zealand in January 1874 to be the shunting engine at Lyttelton. On the S.A.R., where it was in service by 15 April 1879, it became No.38, being unclassed at first. It was renumbered 48 during the year ended 30 June 1881, classified "I" in 1888, condemned in October 1905, and scrapped in August 1909.

No.10 This Avonside 0-4-2T, maker's No.1020, arrived in New Zealand in June 1874. It was in service by 19 November 1881 in South Australia as "M" 47, rebuilt in December 1887, withdrawn on 16 May 1917, and scrapped in 1922.

Western Australia

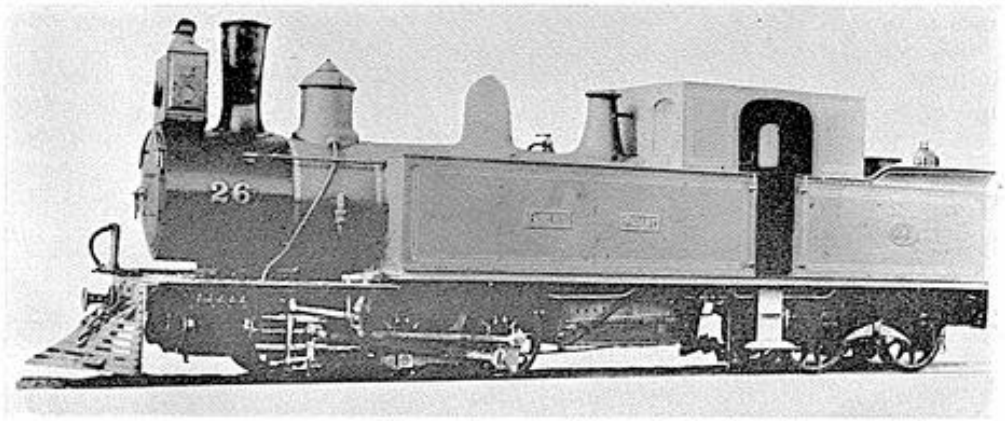
Among other locomotives to cross the Tasman from New Zealand were some for Western Australia and Tasmania. Following the 1887 discovery of gold at Southern Cross in Western Australia, the railways there required additional motive power for the then Eastern Main Line. This line crossed the Darling Range from Belleview to Lion Hill via Sawyers Valley, and abounded in grades of which the majority ranged from 1 in 30 to 1 in 48, the highest station, Zamia, being 1,002 feet above sea level.

To ease the situation, New Zealand Railways sold three "S" class Single Fairlie 0-6-4T locomotives to the WAGR, along with 100 four-wheel wagons, in 1891. There is no evidence that these locomotives were actually used on the heavily graded section of the WAGR's line mentioned above, although the grades were similar to those between Upper Hutt and Summit on the old Rimutaka line, and to those in Taranaki, where this class of locomotive was used in New Zealand.



Photograph: W.W. Stewart

An "S" class 0-6-4T Single Fairlie locomotive No.213 in NZR service. Built by the Avonside Engine Co., Bristol, England, in 1880, it was not withdrawn until 1927.



Photograph courtesy Western Australian Government Railways

One of the three "S" class Single Fairlie locomotives sold by New Zealand Railways to Western Australia in 1891. It had been NZR No.215, and became "I" 26 on the WAGR.

NEW ZEALAND LOCOMOTIVES SOLD TO WESTERN AUSTRALIA

As N.Z.R. "S" Class			As W.A.G.R. "I" Class			
NZR No.	Maker/No.	Year built	Year sold	WAGR No.	Year in service	Year withdrawn
215	Avonside/1283	1881	1891	26	1891	1900
216	Avonside/1284	1881	1891	25	1891	1900
217	Avonside/1281	1880	1891	27	1891	1900

After conversion to WAGR requirements at the railway's Midland Workshops, the three locomotives were classified "I", numbered 25 to 27, and put into service. They were, however, soon superseded by more powerful locomotives, and were written off in 1900.

Tasmania

In 1939 the Tasmanian Government Railways had become rather short of motive power so, to help ease the situation, the NZR sold them four "Wf" class 2-6-4T locomotives to replace their "D" class 2-4-2T type. Used mainly on Hobart-based suburban runs, and classified "DS", these ex-NZR locomotives were used from time to time on the TGR's main line.

One interesting point, noted in a working timetable dated 1 August 1945, was that specific trains were to be hauled by "DS" class engines. Not only that, but greyhounds were to be transported by some of these specific trains as well as passengers.

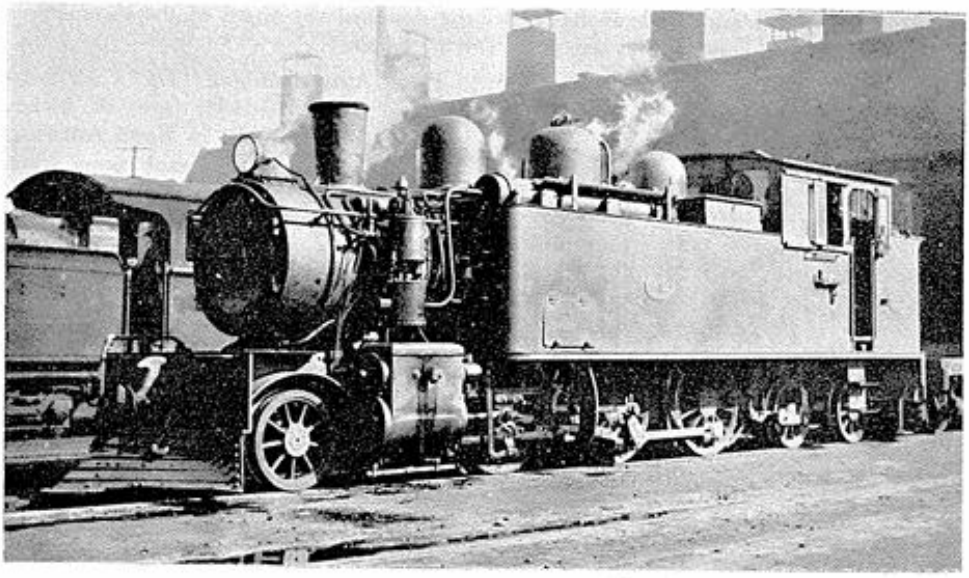
According to the same timetable, these locomotives had to observe quite tight schedules on the 9¼-mile Hobart-Cadburys suburban run. The down run with train 68 and twelve intermediate stops was 28 minutes, and the up run to Hobart as train 75 was 30 minutes. There were, however, no long steep gradients on this section of the system, the steepest being a quarter of a mile at 1 in 50.

On this evidence alone it would be difficult to judge whether or not the schedules were out of the ordinary, because train loads and track conditions are unknown. However, the nearest NZR schedule for this class of locomotive was 45 minutes for the 17¾-mile run from Blenheim to Picton with up to six intermediate stops. This was gleaned from a working timetable of 1951.

Four more "Wf"s crossed the Tasman to Tasmania in 1944. As will be seen from the tabulated data, two of the eight locomotives that went to Tasmania were products of the Addington railway workshops

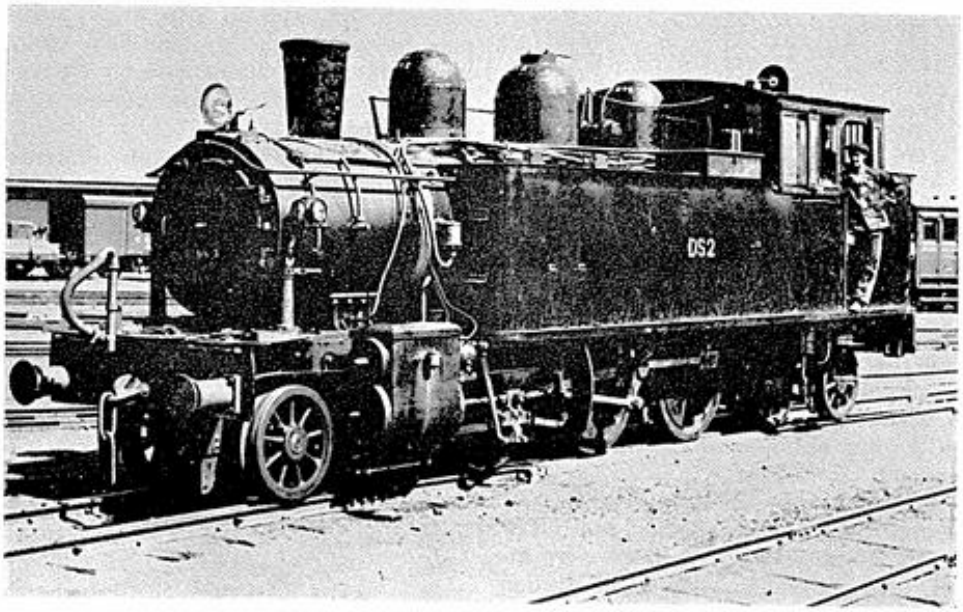
NEW ZEALAND LOCOMOTIVES SOLD TO TASMANIA

As N.Z.R. "Wf" Class			As T.G.R. "DS" Class			
NZR No.	Maker/No.	Year built	Year sold	TGR No.	Date in service	Date withdrawn
381	Addington/61	1904	1939	2	2/1939	10/1951
385	Addington/65	1905	1939	1	3/1939	5/1952
392	Price/4	1904	1944	8	7/1944	5/1953
405	Hillside/79	1907	1944	5	9/1944	5/1956
431	Hillside/86	1908	1944	6	8/1944	5/1953
434	Hillside/89	1908	1944	7	7/1944	5/1958
436	Hillside/91	1909	1939	4	4/1939	1/1952
437	Hillside/92	1909	1939	3	3/1939	5/1953



From the W.W. Stewart Collection

The "Wf" class 2-6-4T locomotive, No.842, photographed at Auckland in the early 1930s, was one of the last three of the class built. It was outshopped by A. & G. Price Ltd, Thames, in 1928.



Photograph courtesy Transport Department (Railway Branch), Tasmania

Tasmanian Railways' "DS" 2 was a product of New Zealand Railways' Addington Workshops in 1904. It ran as "Wf" 381 until 1939, when it was one of four locomotives sold to Tasmania. Another four followed in 1944.

at Christchurch, five were made at the Hillside workshops in Dunedin, and one came from the works of A. & G. Price Ltd, Thames.

The Diesel Era

Although the motive power trade westward to Australia ended with the last four "Wf"s in 1944, it was not the end in the opposite direction. A new movement began in the diesel era when ten diesel-electric locomotives of the General Motors G12 type were ordered from the Clyde Engineering Co. Ltd, New South Wales, and delivered in 1957, to enlarge the fleet of "Da"s.

N.Z.R. "Da" CLASS DIESEL-ELECTRIC LOCOMOTIVES

Clyde Engineering Co. Ltd., Granville, New South Wales

NZR No.	Maker's No.	Date in service
1430	57/134	4/1957
1431	57/135	4/1957
1432	57/141	6/1957
1433	57/142	6/1957
1434	57/152	7/1957
1435	57/153	7/1957
1436	57/154	8/1957
1437	57/155	8/1957
1438	57/161	9/1957
1439	57/162	9/1957

With an improved bogie design, compared with earlier examples of the type, these Australian-built locomotives were permitted to run at express train speeds. A limit of 30 m.p.h. had been imposed on the first examples of the class in New Zealand.

Equipped with American-built General Motors 567C diesel engines and D12F generators, these Clyde products were fitted with Australian-made D19 traction motors on the outer axles of each bogie, the one-hour rating of the four traction motors being 1,240 h.p. altogether. The maximum engine output is 1,425 h.p., and the designed top speed of the locomotives is 62 m.p.h.

These Australian-built "Da" class locomotives, Nos.1430-1439, are 18 inches longer than those built in North America. They have a larger fuel tank slung from the underframe between the two bogies. Like all others of their class, they work in the North Island on all kinds of main-line services.

Locomotives from Queensland

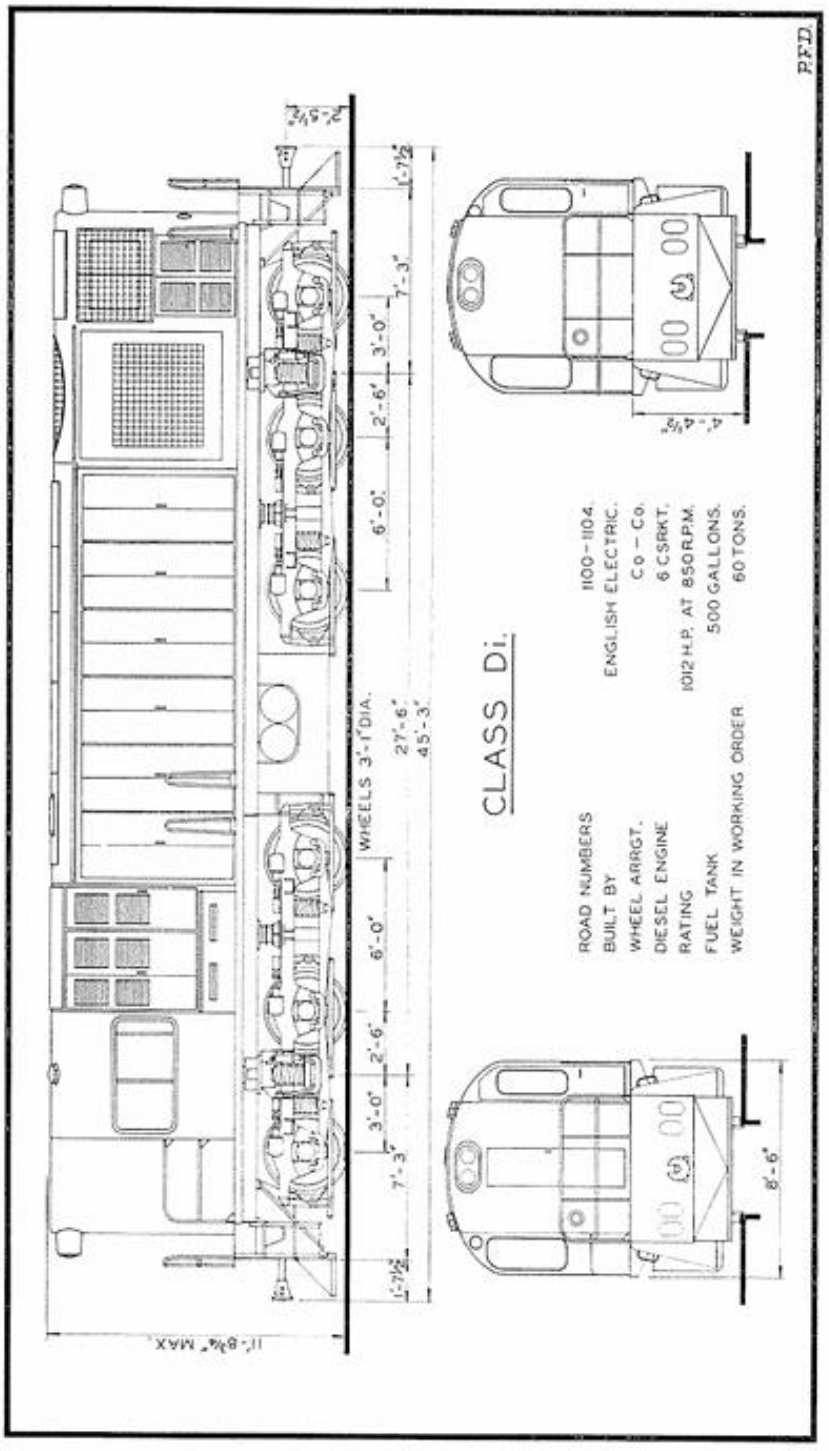
In 1966, a new class of diesel-electric locomotive designed for running almost anywhere on the system arrived in New Zealand. Classified "Di" by New Zealand Railways, five were built by the English Electric Company of Australia Proprietary Limited at their Rocklea Works, Brisbane, Queensland. With an axle load of 10½ tons, compared with the 13 tons of the first diesel-electrics in New Zealand, and the 15 tons of the "Da" class, the "Di" class has running rights comparable with those of the ubiquitous "Ab" class steamers. Yet, with all their weight available for adhesion, they can haul really respectable loads, similar in some circumstances to the "Da" class, though at a lower speed.

Powered by an English Electric 6CSRKT diesel engine developing 1,012 b.h.p. gross, these "Di" class locomotives have a type EE540 electric motor on each

N.Z.R. "Di" CLASS DIESEL-ELECTRIC LOCOMOTIVES

English Electric Company of Australia Proprietary Limited, Rocklea Works, Brisbane, Queensland

NZR No.	Maker's No.	Date in service	Allocation
1100	A118	4/1966	Christchurch
1101	A116	6/1966	Christchurch
1102	A121	6/1966	Auckland
1103	A124	9/1966	Auckland
1104	A125	9/1966	Christchurch


CLASS Di.
ROAD NUMBERS 1100-1104.
BUILT BY ENGLISH ELECTRIC.
WHEEL ARRGT. Co - Co.
DIESEL ENGINE 6 CSRKT.
RATING 1012 H.P. AT 850 R.P.M.
FUEL TANK 500 GALLONS.
WEIGHT IN WORKING ORDER 60 TONS.
WHEELS 3'-1" DIA.
45'-3"
27'-6"
6'-0"
2'-6"
3'-0"
7'-3"
8'-6"

Courtesy N.Z. Railways Publicity

The first "Di" class diesel-electric locomotive on New Zealand Railways, a product of Queensland industry, leaving Wellington with a trial train shortly after being placed in service. Note the instrument car next to the locomotive.

of their six axles. They were the first Co-Co type locomotives to be introduced on New Zealand Railways. Ready for service, each "Di" weighs 60 tons.

An interesting feature is that these locomotives can be operated in multiple with other classes of English Electric origin: the "Df", "Dg", and "Dh"; but not with the "De" class, which is not fitted for multiple-unit operation.

Conclusion and Acknowledgements

Learned readers will have noted that some references have been omitted from this survey, there being no discussion of locomotives, or of parts of locomotives, from such projects as the Auckland-Drury railway, nor of the steam trams for Wanganui and Christchurch, nor of various contractors' locomotives. Time and space have precluded addition of these details, but the foregoing article has covered all the principal instances of locomotives that have crossed the Tasman Sea between Australia and New Zealand.

Information was culled from numerous sources for this article. The compiler is especially grateful to Messrs. K. Flood, of Launceston, Tasmania, and R.A.F. Hay, of Adelaide, South Australia, also to the Western Australian Government Railways and the Tasmanian Government Railways.

Publications consulted included *Cavalcade of New Zealand Railways* (A. N Palmer and W. W. Stewart), and the follow-NZR&LS publications: *Canterbury Provincial Railways* (W. A. Pierre), *Southland's Pioneer Railways* (J. O. P. Watt), *NZR Locomotive List* 1964, and *The New Zealand Railway Observer.*