LIGHT RAILWAYS

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Vic Narrow Gauge Question
Bowral Ballast Tram

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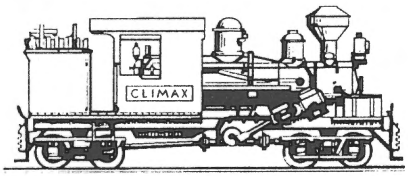

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Light Railway Research Society of Australia Inc.

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Cover Photo:

Baldwin loco at Dreamworld, Coomera, Queensland. This loco was used in France, the Racecourse Sugar Mill, the Goulburn Steam Museum and then Dreamworld. Photo: Dreamworld, 1989.

CONTENTS

Narrow Gauge Question 3
Bowral Ballast Tram 8
Tasmanian Picture Parade 12
Moore Locos in War Service 15
O'Shannassy Water Scheme 19
Letters 21

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The Light Railway Research Society of Australia was formed in 1961 and caters for those interested in all facets of industrial railways in this country and its off-shore territories, past and present.

Members are actively involved in researching light railways in libraries and archives, interviewing knowledgeable first-hand participants and undertaking field work at industrial sites and in the forests.

Who knows what lies hidden in the forest? Members have uncovered tramway formations, sawmill sites, winches, steam boilers, bridges, log landings and more. The Society has been instrumental in preserving many sites through Heritage Classification so that future generations can enjoy glimpses of the past.

CONVERSIONS:

1 inch (in)	25.40 millimetres
1 foot (ft)	0.30 metre
1 yard (yd)	0.91 metre
1 chain	20.11 metres
1 mile	1.60 kilometres
1 super foot	0.00236 cubic metre
1 ton	1.01 tonnes
1 pound (£)	$2.00 (in 1966)
1 pound (lb)	0.454 kilogram
1 acre	0.4 hectare
1 horsepower (hp)	746 Watts

THE NARROW-GAUGE QUESTION

by W. L. Hanks

The question has often been asked as to how a group of narrow-gauge railway lines came to be built by the Victorian Railways and in particular, "why was a gauge of 2 ft 6 ins chosen?"

The cost of constructing new lines to the gauge of 5 ft 3 ins was being scrutinised and with the view towards cheaper construction, narrow-gauge railways were being considered.[1] This happening at least as early as 1870, for in 1871 a report on the Festiniog Railway in North Wales was presented to both houses of the Victorian Parliament.

The report on the Festiniog Railway was in the form of a letter from Guilford L. Molesworth Esq. Director-General of the Ceylon Railway, sent from London, on 24 March 1871. This report briefly describes the history of the railway, its geography, construction, locomotives and rolling-stock. It also outlines the operation and finances of the line. The report discusses in some detail the advantages and disadvantages of using a narrower or different gauge than that already in use by a particular network.[2]

On 23 October 1871 an Act was passed by Parliament for the construction of three new railway lines and stipulated that costs were not to exceed £5000 per mile. The lines authorised for construction were Ballarat to Ararat, Castlemaine to Maryborough and Dunolly, and Ballarat to Maryborough via Creswick. For the first and second lines tenders were called for construction of either 5 ft 3 ins or 3 ft 6 ins gauge. For the first line the difference in cost per mile was £150 and for the second it would have been £181.[3]

The savings that would have been made in construction costs by adopting 3 ft 6 ins gauge, would have soon been soaked up by the transhipment costs at the break of gauge points, consequently the lines were constructed to a gauge of 5 ft 3 ins.

On 9 October 1890 an Act was passed by the Parliament for the formation of the Parliamentary Standing Committee on Railways, for the purposes of investigating and reporting on proposed railways. The first committee being formed soon after. The committees received directions from the Parliament and made recommendations on all proposed railway. Prior to the formation of the PSCR discussions and decisions on new lines were made by Parliament on advice from the railway commissioners.

During 1890/91 the first PSCR, whilst inspecting and taking evidence of some of the proposed railways, had it brought to their attention, that it would be desirable to adopt narrow-gauge lines to serve the outlying mountainous districts of the colony, "...where they would not connect with the existing railway system . . ." The question of using a narrow-gauge was, from then on, to be considered when individual lines were dealt with.[4]

It is interesting to note that by 1891 a number of broad-gauge routes to Gembrook had been proposed, originating from Beaconsfield, Dandenong, Pakenham and Ferntree Gully. All of these routes, except that from Ferntree Gully, had detailed surveys and estimates carried out, including an extension beyond Gembrook of 3.08 miles.[5]

On 2 February 1892 the PSCR sent a letter to the Premier asking him to obtain information on Narrow-gauge lines from the Australian Colonies, New Zealand and India. In particular the information sought from India was of mountain railways of 2 ft gauge. The Committee also requested that a scheme for a cheap railway be suggested to serve a district where a broad-gauge railway was impractical. The proposed line that was chosen was from Bruthen, at the head of navigation on the Tambo river.[6]

The broad-gauge line to Bairnsdale did not reach Bruthen until 1916.[7]

This proposed 2 ft gauge railway from Bruthen to Omeo would have been quite spectacular. It was to be 64.59 miles long with ruling grades of 1 in 30 and curves as sharp as 5 chains radius. At a total cost of £1,247,902 or £19,320 per mile, it would have cost nearly twice that of the average broad-gauge line at the time.[8] The Committee's decision was postponed until information was received from India.

A hiatus of some two years on inquiries into new lines occurred when, on 5 April 1892, the Parliament was dissolved and the PSCR was disbanded. A second Committee was appointed in June 1894, but lasted only three months until Parliament was again dissolved on 4 September 1894. A third Committee was appointed in October 1894.[9]

On 31 October 1894 the Legislative Assembly referred the question of narrow-gauge railways to the third Committee, together with evidence on

Narrow gauge loco 8A at Belgrave. Photo: Phillip G. Ellis Collection.

the subject from the second Committee. Evidence had been collected from a number of witnesses, including officers of the Engineering and Locomotive branches of the Railway Department, others from outside the railways and agents of the 2 ft gauge lines that had been built in parts of France and Germany.[10]

Evidence was so conflicting that on 15 August 1894 the Minister for Railways was requested to have two surveys made on gauges of 2 ft and 5 ft 3 ins on lines through "hilly" country and "very hilly and difficult" country. The districts chosen for the surveys were from Cunninghame to Orbost and from Moe to Walhalla.[11]

A report on the narrow-gauge principle was presented to Parliament on 10 October 1895. It contained a number of recommendations:

1. Two trial lines to be constructed to 2 ft gauge.
2. Lines to be selected according to the Railway Standing Committee Act.
3. Tenders to be invited for construction:
   a. on the Decauville system,
   b. on the Bochumer-Verein system, or
   c. with wooden sleepers and second-hand rails.
4. Estimates of probable traffic, along with costs of construction and equipping 2 ft gauge lines.[12]

The report on the question of "Selecting Localities for the Permanent Survey of Narrow-Gauge Lines" was presented to Parliament on 18 August 1896. It reported that the PSCR had inspected fourteen localities where it would be practical to build 2 ft gauge railways. Out of these four districts were recommended for the construction of trial lines, having presented the strongest claims for a narrow-gauge railway. These were:

Wandin and Warburton District
King River District
Gembrook District
Beech Forest District

The report went on to detail all fourteen districts as to the traffic that would be available, costs of construction and equipment requirements.[13]

In 1897, the Fifth General Report of the PSCR was presented to Parliament. It was broken into three parts, with the third being devoted entirely to "The Question of Narrow-gauge Railways".

When the Committee reported in favour of the narrow-gauge principle in October 1895, it drew special attention to a line in Tasmania that was then under construction, the North-East Dundas

tramway. The Committee went to Tasmania in May 1897, travelling by steam-ship to Launceston, then over the 3 ft 6 ins gauge railway to Hobart and then by steam-ship again to Strahan on the West coast. From Strahan they travelled the 28 miles to Zeehan on the 3 ft 6 ins gauge railway of the T.G.R., where the 2 ft gauge North-East Dundas tramway began.[14]

The Committee gathered much information on the construction, locomotives, rolling-stock and operation of the tramway, which was then reported in much detail. It was expressed in this report that it would be absurd to depart from the 5 ft 3 ins gauge if all that was to be attained was the placing of the rails 2 ft apart on heavy earthworks, but expressed that much could be gained from the proper application of narrow-gauge.[15]

Appended to the Fifth General Report are reports from the General Manager of the Tasmanian Government Railways, Mr Frederick Back, and the Engineer-In-Chief of the Victorian Railways, Mr Fred Rennick. Both these reports make interesting reading on their own, but it

Advertisement in contemporary catalogue in the Victorian Railways Secretary's business papers.

became obvious that there was friction between the two gentlemen as to the application of 2 ft gauge railways.[16]

The report on the question of narrow-gauge railways presented to Parliament on 10 October 1895, had recommended that a gauge of 2 ft be adopted for use on narrow-gauge lines in Victoria. The Committee decided to reconsider the question before any trial lines were commenced, as they had recently received further information. The Engineer-In-Chief had directed that ". . . the 2 ft gauge lines have curves no sharper than 2 chains radius . . ." and informed the Committee ". . . that a line of 2 ft 6 ins could be laid down on such curves, costing only about 5 per cent more, whilst using the same weight of rails."[17]

The Chief Engineer of Railways in Queensland, Mr H.C. Stanley, who had recently returned from a tour of railways in America and Europe, had reported to the Queensland Government, ". . . it is not advisable to employ a gauge less than 2 ft 6 ins . . ."

Mr Calthrop, late Assistant Locomotive Superintendent of the Great India Peninsula Railway, said that, ". . . after thorough investigation, it was decided to adopt the 2 ft 6 ins gauge for the Barsi Railway which he is constructing in India." Mr Calthrop said of the 2 ft 6 ins gauge – "There is no doubt that, as compared with all others, it is the gauge possessing the greatest carrying capacity per cent. of cost of track . . ."

In view of these opinions and ". . . as a considerable increase in traffic capacity can be secured without an undue increase in cost of construction . . ." the Committee recommended that the 2 ft 6 ins gauge be adopted as the narrow-gauge standard in Victoria.[18]

Mr John Mathieson, the Victorian Railways Commissioner, expressed his concern over the adoption of narrow-gauge railways – "With respect to the two narrow-gauge lines which have been authorized, I desire to state that, in my opinion, they will be found to be very costly experiments . . ."[19]

The Whitfield Line had been authorized by Act No. 1492, on 24 August 1897. "The gauge has, however been increased from 2 ft to 2 ft 6 ins, under instructions of the Minister for Railways on 24 February 1898 following the recommendations of the Parliamentary Standing Committee on Railways".[20] Construction commenced on 1 March 1898, was completed on 14 March 1899 and opened for traffic on 29 April 1899.[21]

The Lilydale to Yarra Junction line, whilst passed by the Lower House of Parliament for construction at 2 ft gauge, was altered by the Upper House to a broad-gauge line starting at Coldstream. It was then postponed for the consideration of the new Parliament and was eventually built as a broad-gauge line.[23]

The fact that the Wangaratta to Whitfield line was authorized as a 2 ft gauge line, but was actually built as 2 ft 6 ins, is reflected in many of the plans for the line, with the 6 inch pencilled in after completion.

A relevant book held in the Public Transport Corporation's library, is called "Light Railway for the United Kingdom, India and the Colonies" by John Charles Mackay, printed in 1896. It appears that this book was obtained by an officer of the Victorian Railways on 5 May 1896. A number of points in the book are highlighted, but the most interesting is the sentence – "The most suitable gauge for local railways may be taken to be 2 ft, or preferably 2 ft 6 ins". It is this author's opinion that this book would have been read by the Engineer-In-Chief, Mr Rennick and played a large part in the decision to select a gauge of 2 ft 6 ins.

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Advertisement for light railway plant. The Victorian Railways considered this information and ultimately opted for Baldwin pattern locos.

BOWRAL BALLAST QUARRY CHRONOLOGY

By Jim Longworth

INTRODUCTION

Coarse rock ballast is a vital component of high class railway track, providing a free draining environment around the sleepers supporting the rail. Such drainage is necessary to prevent development of a spongy subgrade, which would lead to destabilising the track.

Immediately north of the town of Bowral on the NSW southern tablelands is a small mountain known as The Gib (short for Mt. Gibraltar, with a fancied resemblance to the Rock of Gibraltar). The Gib is an intrusion of the igneous rock Trachyte, which is sometimes known as Micro-syenite. Stone from The Gib has been used in the piers of the Hawkesbury River bridge and was a very popular building stone in Sydney.

CHRONOLOGY

December 1867. An extension to the Great Southern Railway is opened as a single track line from Mittagong to Moss Vale.[1]

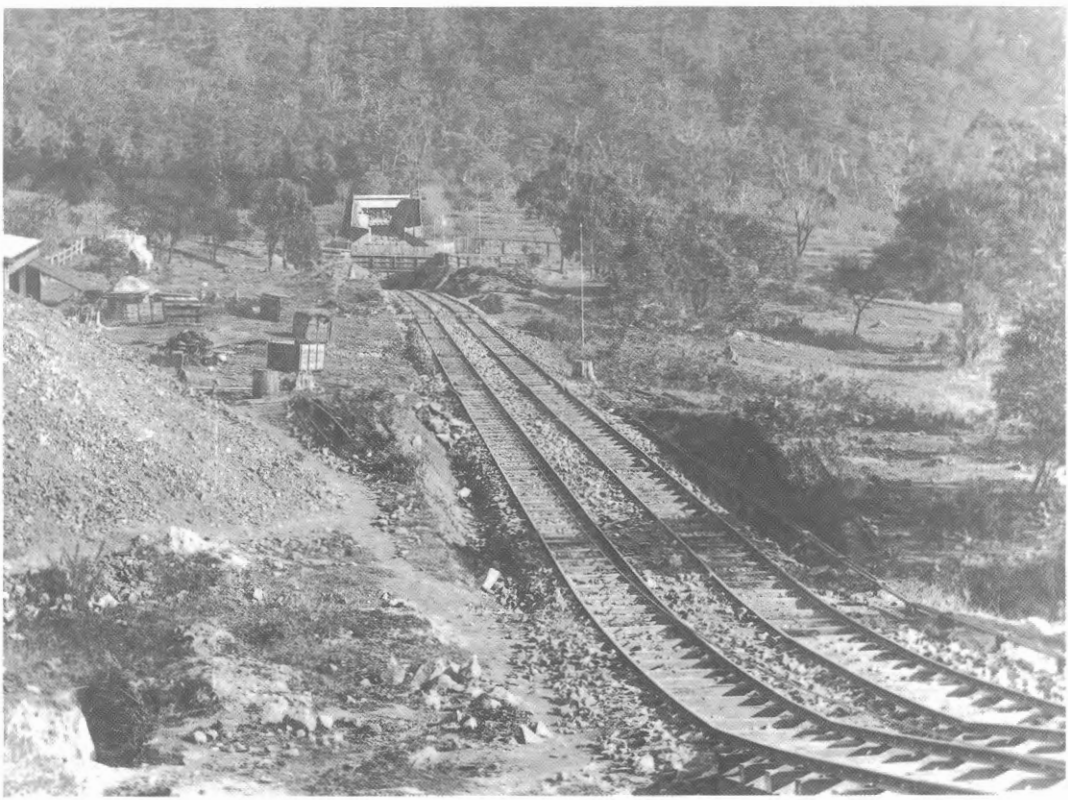
January 1891. At least three quarries are operating on the lower slopes of The Gib.[2]

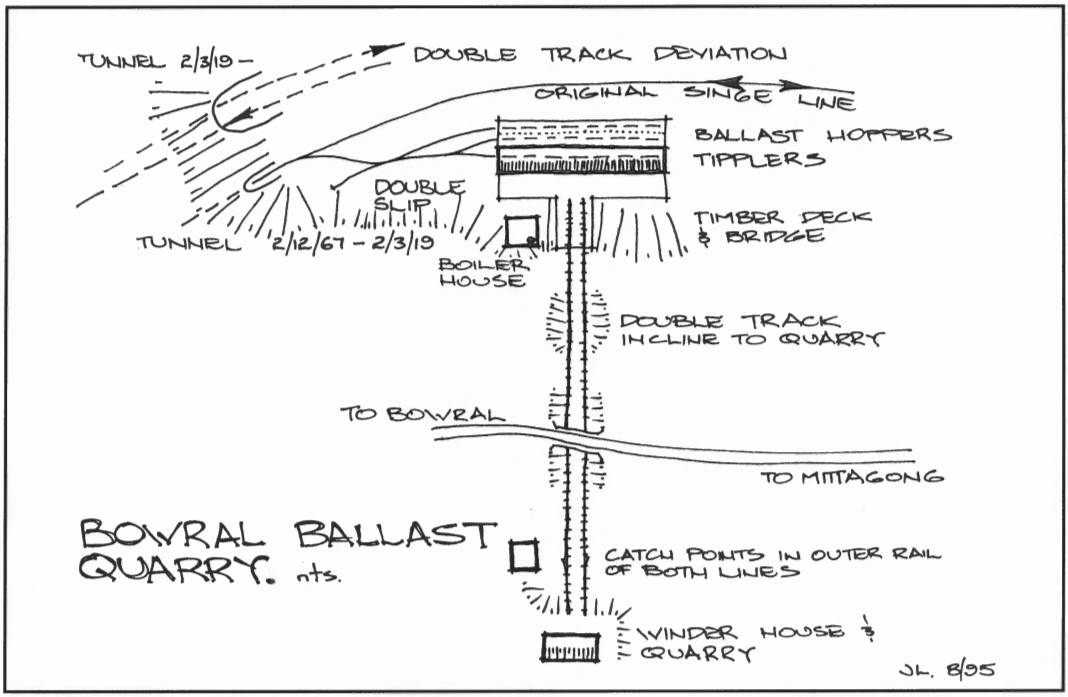
October 1889. The Railway Southern Division engineer estimates that 476,000 cubic yards of ballast would be needed to bring the standard of the lines up to a proposed new cross-section.[3]

December 1889. Owners of a quarry at Bowral offer to supply large quantities of ballast.[4]

11 February 1890. Engineers visit Bowral and find a considerable quantity of small boulders lying on the surface which would be suitable for breaking into ballast.[5]

The superbly engineered incline at Bowral. Photo: Courtesy Jim Longworth.





March 1890. Approval is sought from the Railway Commissioners to use a quarry on The Gib.[6]

March 1890. A tender is accepted from Hudson Bros at £1,299 for equipment on a three foot gauge quarry tramline.[7]

March 1890. Tenders are accepted from Park and Lacy at £320 for two rock breakers and from Jaques Bros at £660 for four patent crushers for the quarry.[8]

June 1890. A certain Mr Eddy claims that the reason for trains not running to time is due to the bad state of the track, which needs re-ballasting. The incline between the quarry and crushers is described as passing through a Mr. Beer's land; gravity worked, with full trucks going down hauling empty ones up; double tracked; passing through a cutting under a road bridge; 20 chains long and on a grade of 1:40 to 1:80.[9]

June 1890. The quarry is being opened out.[10]

July 1890. Messrs Monie and Angus are laying the tram line and Hudson Bros are erecting the staging and crushing plant.[11]

October 1890. The quarry is described as being on Messrs Amos' property and about to be opened, with the crushers and tramline to be ready about mid November. The incline is described as having a drum six feet in diameter, weighing about three tons, erected on an ironbark timber frame twenty feet long, eleven feet high and seven feet wide. The engine house at the crushers is described as being twenty-five feet by eighteen feet and containing a Robey, thirty horse power, semi-portable engine. The engine also drove the rock drill in the quarry using compressed air. The crusher staging is mentioned as one hundred feet long by forty feet high, being built in three tiers and supported on sixty iron bark posts twelve inches square by forty feet long. Flooring was of six inch hardwood and oregon bracing. The six tipplers on the top tier capsized into the crushers on the second tier from where the metal fell onto iron screens and from there into the hoppers below. Capacity was expected to be 550 tons per day, employing fifteen men at the crushers and more than fifty in the quarry.[12]

15 January 1891. The quarry siding interlocking is opened.[13]

February 1891. A tender is accepted from Mr. W. Ewart at 5,470 pounds one and eight pence for duplicating the mainline from Mittagong to the Bowral tunnel.[14]

March 1891. Employees in the quarry stage a strike for an increase in pay from seven and six Pence to eight Shillings per eight hour day. The Railway Commissioners order immediate dismissal of the strikers. An official is due to arrive to deal with the matter and endeavour to arrange a settlement.[15]

Early 1891. Frequent and repeated accidents occur in the quarry resulting in injuries to several workmen.[16]

23 May 1891. Men working in the various quarries on The Gib combine to form the "Berrima District Workmen's Accident-Relief and Endowment Fund".[17]

June 1891. Widening of the mainline is complete except for laying the permanent-way.[18]

October 1891. The government railway time table allows for a light engine to run from Mittagong to the quarry, attach a full load of hopper wagons and brake van; discharge the ballast at various places along the mainline, return the empty wagons to the quarry; and return light to Mittagong "where it will sleep".[19]

13 December 1891. A new independent line is opened alongside the main line from Mittagong station to the quarry siding.[20]

4 July 1895. Cross-over points are laid in at the quarry siding near the tunnel mouth.[21]

1897 (?) Instructions are issued to railway staff concerning the running of trains on the independent line, working the quarry siding, working the cross-over, standing wagons on the siding and making up trains.[22]

December 1899. The quarry siding is closed.[23]

2 March 1919. The mainline is deviated, duplicated and opened between Mittagong and Bowral.

Early 1995. Author locates some photographs of a little known, very neat and overly engineered, quarry incline, in the SRA Archives and begins researching. The records do not reveal why the quarry closed prior to exhausting the potential supply of rock but it is suspected that the rock proved unsuitable for the purpose of track ballast. The rock is quite hard but is also quite brittle.[24]

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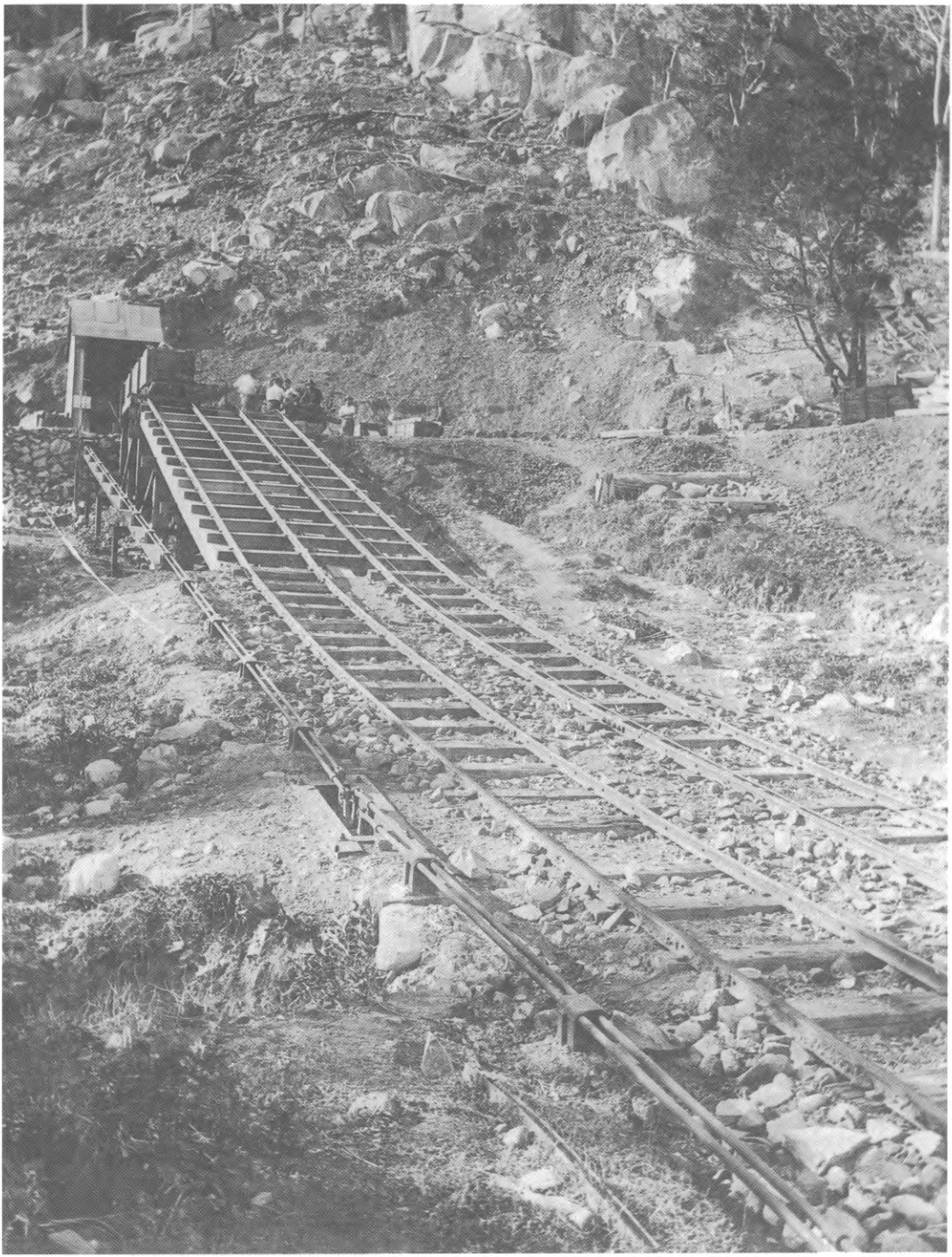
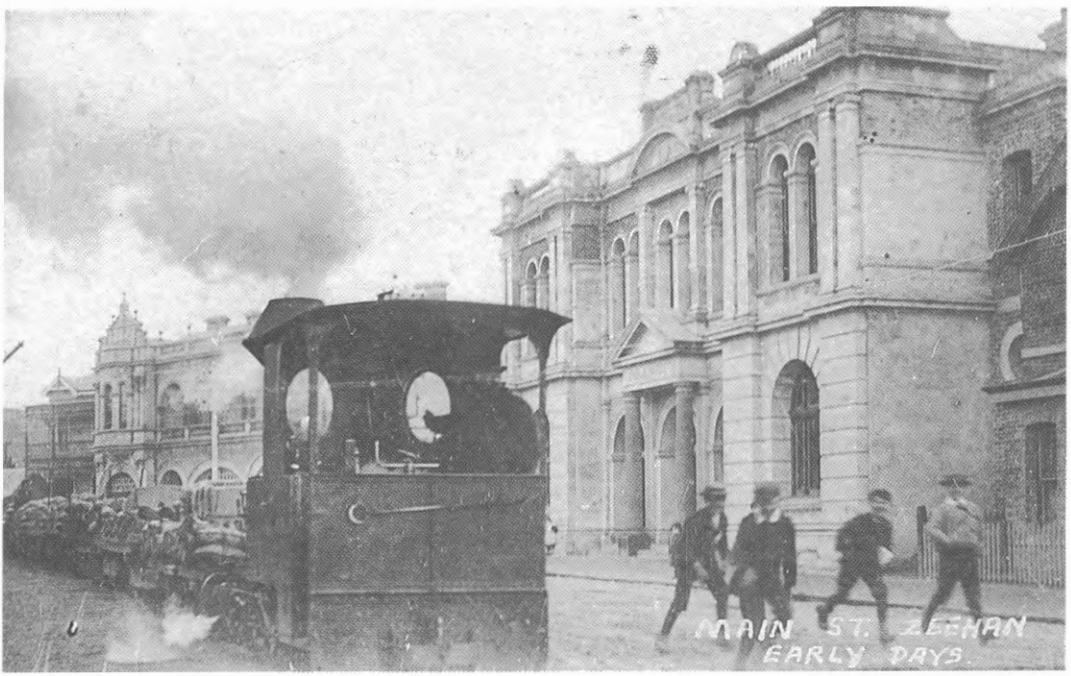


Top of the Bowral Incline. Photo: Courtesy Jim Longworth.

TASMANIAN PICTURE PARADE

Main street at Zeehan in 1903, showing the Zeehan Tramway Co's line. Photo: C.B. Thomas Collection.



Main street at Zeehan. Dunkley Bros' Zeehan Tramway Co. No 1 loco, Krauss 3941 of 1898, puffs past the camera. Photo: C.B. Thomas Collection.

The Venezia Hotel at Zeehan has a tram stop outside its door. 1908. Photo: C.B. Thomas Collection.

Main street at Zeehan. 1907. Note the office of Dunkley Bros on the bend. Dunkleys owned and operated several tramways in the region. Photo: Winter's Studio, Burnie.

'Wee Georgie Wood', taking water on the Tullah tram. Photo: Winter's Studio, Burnie.

Krauss No. 9 taking water on the Tullah tram.
Photo: Winter's Studio, Burnie.

All photos contributed by Jim Longworth.

MALCOLM MOORE LOCOMOTIVES IN WAR SERVICE

INTRODUCTION

In the 1920s Malcolm Moore, like many other small engineering companies world wide, started manufacturing and marketing a small locomotive based on a Fordson tractor. This consisted of the tractor, minus the wheels, fenders, etc. mounted on a chain driven 4 wd frame. These units proved quite popular.

During World War Two a new locomotive was developed around a Ford V8 truck motor fitted with a Malcolm Moore reverse gearbox placed after the truck gearbox thus giving four speeds in each direction, with an extra low gear also in each direction.[1] The weight of this locomotive was around three tonnes. This locomotive was used at a chemical company in Adelaide.[2]

During World War Two 92 locomotives were supplied to the Army in one order '. . . for hauling stores from beach heads to storage dumps'.[3] After the war, many of these locomotives were sold in 'as new' conditions so that there has been some doubt if any of these locomotives were ever used by the Army.

The author is currently researching the history of these Malcolm Moore V8 Locomotives (as they were called by the company). The war service picture is of particular interest. R.F. Ellis was able to supply information about some of these locomotive used in Sabah. This article is based on information provided by R.F. Ellis via John Browning. Needless to say the author welcomes any further information on any aspect of Malcolm Moore V8 locomotives and their usage.

THE NORTH BORNEO RAILWAY

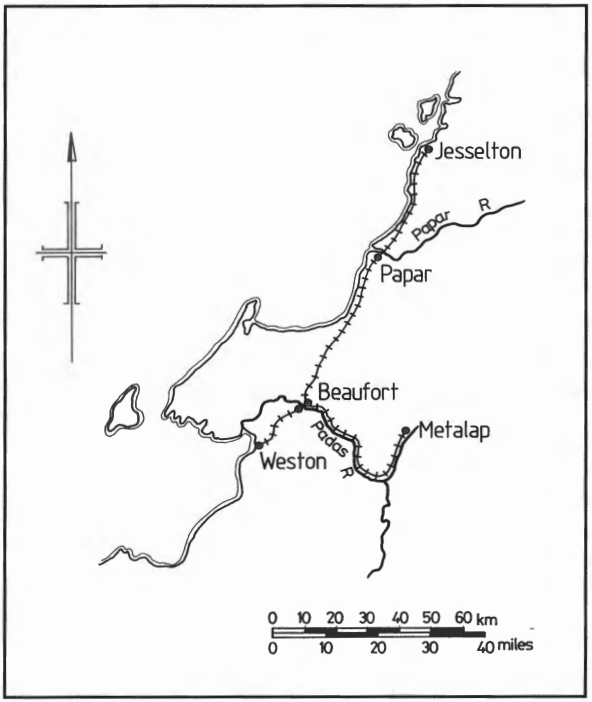
The one metre gauge railway, 116 miles long in Sabah, was a typical colonial line serving ports with rubber plantations, small local industries and a passenger service between key towns. The main line ran 56 miles from Jesselton to Beaufort. A light branch of 40 miles continued from here inland following the course of the Padas River to Metalap. Another separate branch operated from South Beaufort (separated from the other lines by the river) to the port of Weston. The line progressed from four coupled to six coupled tender and tank locomotives weighing in excess of 20 tons. By 1941 rolling stock consisted of 12 steam locomotives, a Sentinel shunter and eight very small petrol railcars.[4]

EFFECTS OF WORLD WAR TWO

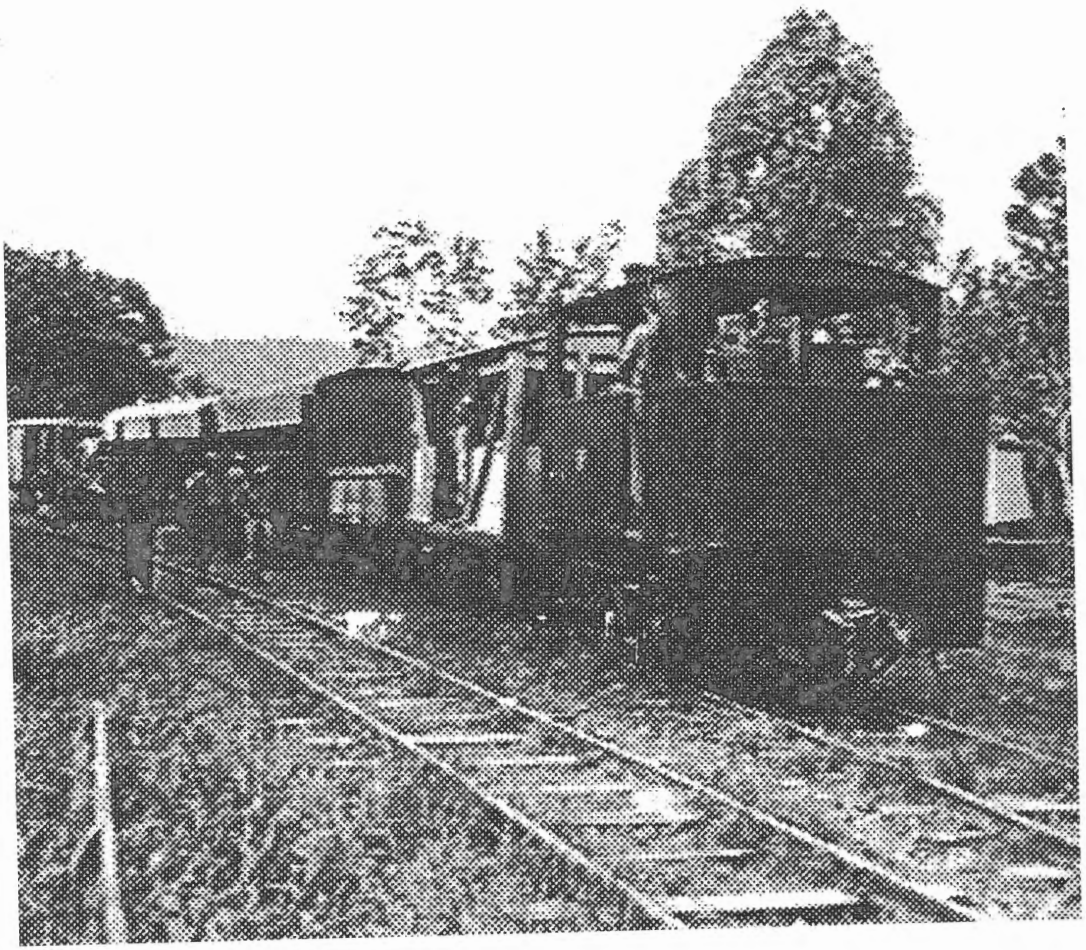
The Japanese took over Sabah during World War Two and as a result of being a bit of a backwater, track maintenance was cut. In addition, extensive bombing took place so that track was blocked by bomb craters and sections were under water because of blocked drains. As well many bridges were demolished. Rolling stock was to a large extent destroyed or in poor condition.

The line became strategic, however, since it was the only means of communication to the interior. The initial Allied plan was to land at Weston on the coast and then move on to Beaufort in part using the railway. At this stage the only rolling stock were light flat top trucks which were pushed by hand. Locomotives were urgently required. According to the official history of the Royal Australian Engineers (RAE) there were locomotives of two foot gauge available from the RAE dumps but it was considered impractical at the time to widen the gauge to a metre[5] (although this was done afterwards). In view of this lack of rolling stock one wonders why the line wasn't simply narrowed to two foot gauge by relocating one of the rails or adding an extra rail in the middle to allow the use of these locomotives and rolling stock as was done frequently in France during World War One. A locomotive was improvised by converting a jeep by fitting improvised flanged wheels. It was found that the gauge of jeeps was 49 inches but by adding a flange to wheels from captured Japanese trucks this could be reduced to a metre. Beaufort was eventually captured and the engineers opened a sawmill and quarry as well as rebuilding the line to Beaufort.

Swamp and jungle meant that the railway to Jesselton was the only means of advancing. It was decided that light trains running frequent services met the current needs best. It was decided to renovate one recaptured 12 ton Sentinel locomotive for stone traffic and use jeep locomotives for the rest. Accordingly, 14 sets of converted truck wheels were made allowing 11 jeep locomotives to operate north of the Padas river and three between Weston and South Beaufort.



Below: Australian servicemen using the jeep railway in Sabah, 1945. Photo: Geelong Advertiser.

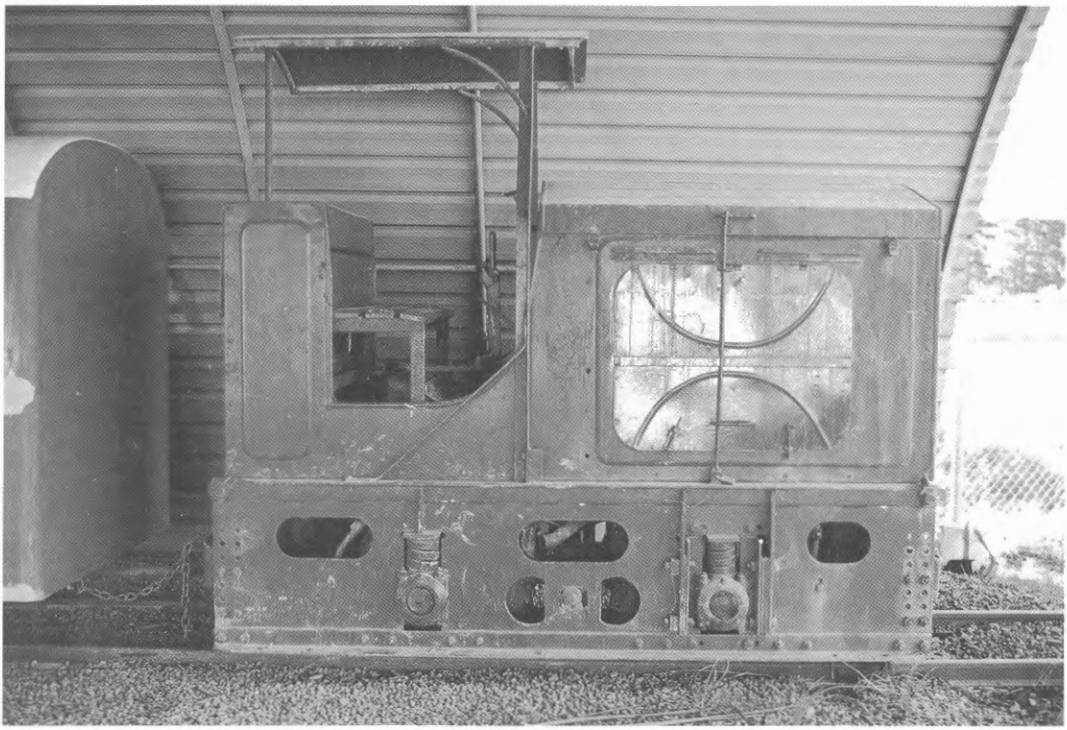


Sentinel loco at Beaufort, Sabah, July 1945. Photo: Geelong Advertiser.

AFTER WORLD WAR TWO

The Army ran the railway for two months after the conclusion of World War Two and then handed it to the local government. Rolling stock was described in 1946 as four renovated locomotives (out of 13 pre-war), jeep locomotives and Malcolm Moore V8 petrol locomotives[6]. Four Malcolm Moore locomotives were consistently recorded from later sources. Their initial role was described as running a twice daily service between Beaufort and Metalap as the track did not permit the use of steam locomotives.

Upgrading of the Beaufort and Metalap line was a low priority but by 1952 repairs to pre-war locomotives and new stock made the Malcolm Moore locos main line role redundant. In 1953/4 their numbers were described as 30 to 33 and they were reported to be stationed at Pengalat Quarry and the Firewood Reserve at mile 35.[7] A trip along the Metalap line described in 1958 reported their use in service trains involved in the upgrading of the line from 30lb rail to 60lb rail.[8] They were reported to be still on the books in 1966-67 but their numbers were taken by Japanese built diesels in 1970-71. R.F. Ellis reported seeing one in 1983 but it is unknown if any still exist in Sabah. A recent letter by the author inquiring about them resulted in the railway officials denying that they existed at all so that it seems that local knowledge of them has gone.



Malcolm Moore loco of the type used in Sabah. Photo: John Petersen.

As far as the author is aware, this is the only use made of Malcolm Moore V8 Locomotives as a direct result of the war service for which they were built. In retrospect, a more unlikely role of running a 'main line service' could not be imagined. The fact that they lasted for so long in service like many of the others, over 29 years, is a tribute to the workmanship of the people at Malcolm Moore.

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THE O'SHANNASSY WATER SCHEME

by E. G. Ritchie

The proposition to divert the head waters of the Upper Yarra (including its most important tributary, the O'Shannassy River) for the purposes of the Metropolitan Water Supply, was first mooted in 1888 by Mr W. Davidson, Engineer of Melbourne Water Supply at that time.

Mr Davidson then estimated that the Yan Yean and fully completed Maroondah scheme would be entirely required to serve a population of about 700,000 persons. To provide for further population he recommended the Government to reserve some 47,000 ha of State forest at the head of the Yarra for water supply purposes.

To provide for every possible and probable development of the higher levels of the eastern and south-eastern metropolis by a gravitation supply it was deemed expedient by the Metropolitan Board of Works to carry out the first step in the Upper Yarra scheme by a conduit as far as the O'Shannassy River, before completing the Maroondah scheme. This action was necessary because the Maroondah aqueduct would not serve the higher levels referred to except by resort to pumping, which was undesirable, and was shown to be more costly than a new and separate high level conduit from the O'Shannassy River.

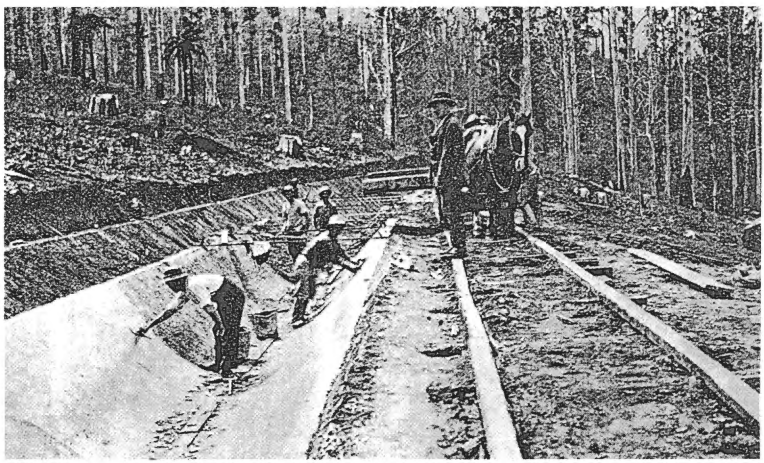
The permanent survey was commenced in 1910, and the first contract for construction was let in October, 1911.

The O'Shannassy River rises in the slopes of Mounts Strickland, Grant and Arnold, and has a junction with the River Yarra 12 km above Warburton. It was diverted at a point nine km above its confluence with the River Yarra by means of a concrete weir. From this point a conduit of 91,000 megalitres per day capacity, 80 kms in length, delivers the water into two service reservoirs at Surrey Hills, the larger of which has a capacity of 68,000 megalitres, and is part of the new expenditure.

The conduit comprises:

- 36 km of open or covered channel
- 3 tunnels aggregating in length a little over 800 metres
- 37 km of steel pies
- 400 metres of reinforced concrete pipes
- 3.5 km of wood stave pipes

From the diversion weir on the O'Shannassy River at 298 metres above sea level the conduit follows the mountain slopes on the Northern side of the River Yarra to a point about three km west of the Don River, Launching Place, at elevation 271 metres. An inverted syphon conveys the water through Killara and Seville to Wandin. Thence the conduit follows a line south of and in fairly close proximity to the Warburton Railway to a point about three km south-east of Lilydale on the main western ridge of the Olinda Creek. From



Typical length of wooden tram used on the open channel.

Tram wagon used as the mixing board.

Olinda Reservoir the water is carried via Mitcham to service reservoirs at Surrey Hills.

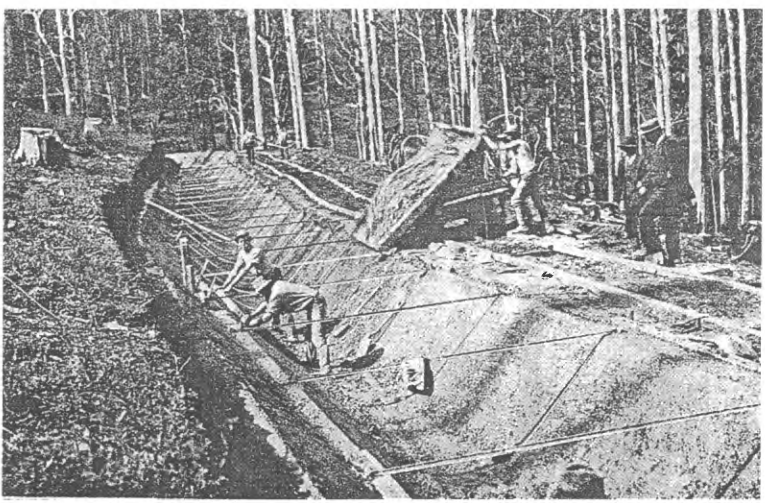
The open channel has been constructed to the following dimensions for a 91,000 megalitres per day discharge:

- Width: at top, 9 ft 3 in (2.81 metres)
- Depth: 3 ft 4½ in (1028 mm)
- Shape: Quadrant of a circle in invert with 1 to 1 slopes
- Inclination: 2 ft per mile

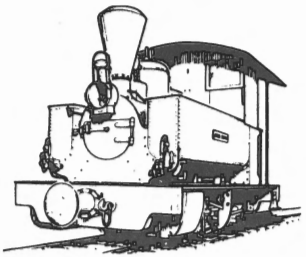
The channel is founded everywhere in the solid ground. The lining used is of cement mortar. The stone used for toppings has mainly been derived from Cave Hill Quarry, Lilydale, or from Black's Quarry, Coldstream, though a little bluestone toppings were used from Melbourne.

A tramway was laid along the entire length of the open channel route in sections as construction advanced for cement, timbers and other materials. Steel and wooden rails were used. Horses provided the motive power. One unusual wagon was a mixing board, comprising a tilting platform on which shovelmen mixed the mortar prior to its being tipped into the channel. The scheme was completed in 1914.

Contributed by David Mottram.



Portable mixing board discharging mortar into the channel.



LETTERS

Dear Sir,

Otways Tramways

While looking over some notes recently I was reminded of some details on various tramways in the Otway Ranges that I have had experience with. This information may be of interest.

In 1962 I purchased several 2 ft 3 in wheel sets and bearings from the Sunshine Case Co. in Sunshine, Vic, which had been established about 1920 for producing boxes etc. The track was 14 lb per yard and the wheel sets were 12 inches in diameter with a curved spoke pattern and external bearings which were of the typical logging type but with a cast box 1½ inch deep. I believe this is an early type where animal fat was used and the heat generated by the bearing melted the fat and so lubricated the shaft. The owner advised me then that they had come from the 'Anglesea area' on the coast. They had burnt the frames but apparently were a single unit type – not bogie. I understand that early tramways used a single truck for cut timber transport rather than two trucks to a load. Armistead's timber tram at Lorne had a gauge of 2 ft 3 in. This is an unusual gauge, although it was used in some military installations, and I wonder if Armisteads picked it because the tram on the Lorne jetty was 2 ft 3 in or whether they acquired second hand 2 ft 3 in wheelsets and laid the jetty tram to that gauge.

Erskine House, Lorne, had a 15 in gauge firewood line running from a wood heap of 6 ft billets and 12 in stove lengths, to the boiler house and kitchens. Two trucks were used with gold mine wheel sets (ex Deans Marsh?). This was closed in the early 1970s. The boiler, incidentally, went to Sovereign Hill, Ballarat, afterwards.

Sharp's last mill at Lorne (1943 to 1971) had 3 ft gauge lines in the yards. It was, I think, the last mill in the area to use steam.

In 1969 I bought a six acres lot at Wormbete, part of the original subdivision and laid an 18 inch gauge line of firewood extraction, about 30 metres in length. I walked the Wormbete Wattle Co. tramline several times. The Bell Brae Sawmill, run by the Bubb family until the 1960s, had several wheel sets of 20 inch gauge, about 10 inch wheel diameter with four holes, not spoked. I think these would have been from the Wattle Co. line.

In 1967 I purchased a 'Jubilee' side tipper frame from Joe Hayden at Barwon Downs who told me that Hayden Bros. had bought most of the Otway Shire gravel tram line at Apollo Bay and used the plant for timber tram construction in the 1920s and 1930s. In later years the frames were used in the company's seasoning kilns at Barwon Downs with 20 lb rail.

Denys Steinhauser
Wodonga, Vic.

* * *

Dear Sir,

I was saddened to read, in LRN No. 113, of the death of Charles S. Small, railway historian. I knew that he had contracted Parkinson's Disease and had heard rumours of his death, so the item in LR 113 confirmed this rumour and put a date to it.

My first contact with Charles was in 1983 when I wrote to him about whether certain Japanese Govt Railway C51 class Pacific locomotives had ended up in China during the war. In his book 'Rails to the Rising Sun', he gave a list of Japanese locomotives that did go to China during this conflict and these Pacifics were not on the list. In his reply, he was most doubtful that this transfer had occurred, but then another letter arrived saying that he had further checked other Japanese records which showed that these C51s did go to China after all, and he said '... you were right and I was wrong ...'. So, from then on I think that I was accepted as a respectable railway researcher, and we corresponded for many years.

We mostly exchanged views on the steam locomotives of China, occasionally we would touch on light railway matters. Obviously from his published works he was interested in both mainline and light railways, and perhaps mores so in the unusual, eccentric and remote railways, which many light railways can be described as.

During the time that he lived and worked in Japan, in the 1950s and 1960s. he met many Japanese railway enthusiasts, including those who had worked on the Japanese railways before and during the war, or who had been involved with the railways in the Japanese occupied areas of

China, so he gained a vast amount of information on these times. Any historian is only as good as his sources, and Small's sources of information on the railways of Japan and China were excellent.

His best known book for Australian readers is perhaps 'Rails to the Setting Sun', in which he describes, along with railways in many other places, the sugar tramways of Queensland. For me, with my great interest in the railways of China and Japan, his best work was 'Rails to the Rising Sun', in which he writes of many of the smaller and odder of the private railways of Japan, some of which obviously can be labelled as 'light railways', others not. But this book is not just an ordinary railway book of technical data and lists of locomotives. It touches on many things Japanese that are perhaps only loosely connected with railways, but still have an effect on how the Japanese run their systems.

My last letter from Charles was in April of 1990 and in this letter the signs of his unfortunate deterioration were becoming evident.

My sympathy goes out to Mrs Small; with Charles' death the railway historical fraternity is sadly diminished.

Now, to another subject, much closer to home. This is on Mr J. Browning's article: 'An Australian Military Might-have-been', in Light Railways for July of 1996, in which he asks for information about the Australian War Memorial site in Melbourne.

I was born in 1925 and for the first ten years of my life I lived in Collingwood, which is not far from the Melbourne Exhibition Building, and during this time I certainly paid at least one visit to this display.

I'm fairly sure this display was at the Nicholson Street, or eastern end, of the Exhibition grounds, perhaps about where the present mirrored wall building is. I can remember a small steam locomotive there, probably the O & K loco illustrated in Mr Browning's article, some artillery pieces and a tank, but I also have a memory of a second steam loco, unless this second engine was something that had an horizontal boiler of some sort, perhaps a traction or portable engine instead.

I remember that I was able to climb up into the cab of the loco, I probably climbed through the post and rail fence of the illustration to do so. I had the impression that the loco was under a roof of some sort.

At that time, and I was probably about eight years old, I only had the normal small boy's interest in trains, I certainly wasn't any sort of rail enthusiast or fan

However, perhaps we can look a bit closer at the illustration. The building appearing in the top right hand corner is fairly distinctive. It is the style of the Exhibition Building, but is not part of that building. It has clerestory lights, and I wonder if it is the old Aquarium Building which I think was in the same area at the same time as the military display. This building was to the north of the Exhibition Building in about the area of the existing car park. There are two buildings with corrugated iron roofs to be seen, indeed one also has corrugated iron walls, and also something that looks like the hipped roof of possibly a private house, with Marseilles tiles. The corrugated iron buildings may have formed part of the War Memorial Display, with the bigger items such as tanks, guns, locomotives etc. outside in a separate compound, which could explain the fence between the loco and the buildings.

All this is pretty hazy, but I hope that it might be a bit of help to Mr Browning.

Bill Pearce
Kensington Vic.

* * *

Dear Sir,

Rail Versus Road

Not only did traction engines damage local roads (LR 132, p 32), so did log jinkers and wagons loaded with sawn timber. See accompanying photographs. This situation placed local councils in a difficult position. Damage to local roads caused complaints from local farmers but the timber business furthered local economic growth. The environmental impact of of vested interest, on the greater community, continues today. Light rail remains a potential solution.

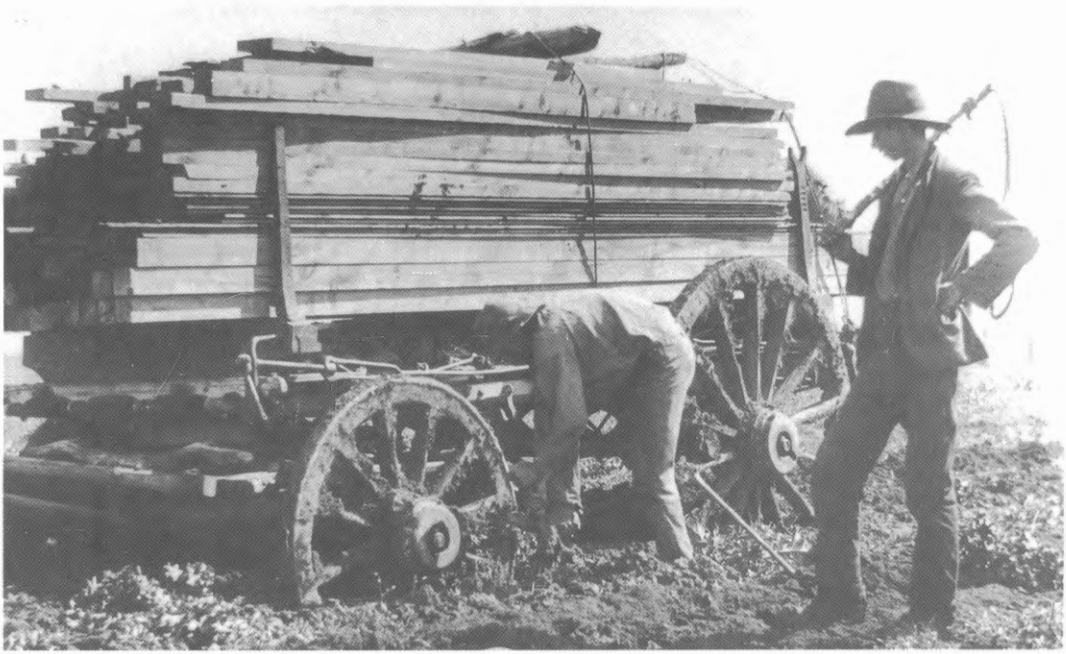
Jim Longworth,
Cheltenham NSW

ERRATA

The front cover photo and that on p.16 of Light Railways 134 are printed back to front. The caption to the p.16 print does not make sense as a consequence. Hold the affected photos to a mirror to get the right view.

The word 'not' was omitted in John Browning's letter in LR 134, p.20, right column, line 20 from bottom.

Wagon load of Cypress Pine logs and flooring bogged on 'The Black Mile', east of Spring Ridge, NSW, c. 1920. Photo: Mitchell Library.



Mired on the NSW north coast, August 1925 Photo: Mitchell Library.

BRITISH-AUSTRALIAN MACHINERY COMPANY, LIMITED.

MODELS A. and B. PATENT GEARED LOCOMOTIVES

For haulage on Steep Gradients, Bush Tramways, etc.

AN ECONOMICAL HILL-CLIMBER.

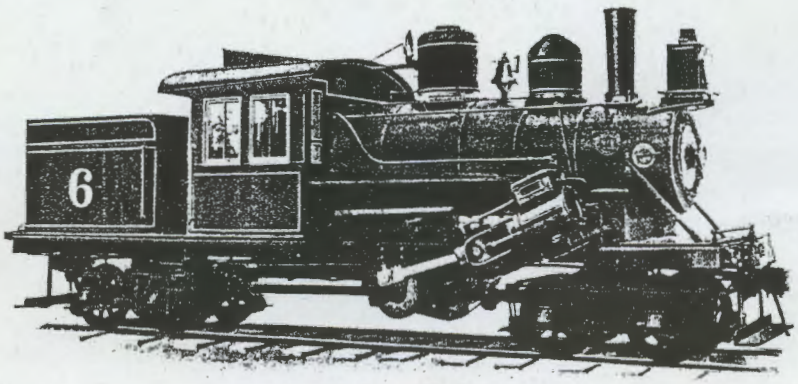


Fig. 125.—Model B, with horizontal type engines.

MODEL B.—HORIZONTAL TYPE—EIGHT DRIVERS.

Cylinders { Diam. / { Stroke	9" / 12"	9¾" / 12"	11" / 12"	11¾" / 12"	12" / 14"	12½" / 14"	13¼" / 14"	13½" / 16"	14¼ / 16"
Service Weight ... tons	22	27	32	37	42	46	52	57	62
Rigid Wheel Base ... ins.	45¼	45¼	46½	46½	51½	51¼	51¼	51¼	51¼
Total Length ... ... feet	28½	30	31½	32½	35½	37	37½	37	38
Diam. of Driving Wheels ins.	28	28	30	30	33	33	33	35	35
Tractive Power ... lbs.	8800	10,800	12,800	14,800	16,800	18,400	20,800	22,800	24,800
Hauling Capacity (excluding own weight)—									
On level track ... ... tons	1078	1323	1568	1813	2058	2254	2548	2793	3038
„ 1 per cent. grade .. „	292	359	435	492	558	611	691	757	824
„ 3 „ „ „ ... „	107	132	156	181	205	225	254	278	303
„ 5 „ „ „ ... „	59	73	87	100	114	124	141	154	168
„ 8 „ „ „ ... „	30	37	44	51	58	64	72	79	86
„ 10 „ „ „ ... „	20	25	30	34	39	42	48	53	57

Dimensions, etc., are subject to alteration without notice.

Weights given in tons are 2,000 lbs. per ton.

Heavier Locomotives are made with 12 driving wheels.

For further particulars see pages 48 and 49.

Note.—When enquiring for price, state full particulars of work to be done and of working conditions.

B.N.Z. Chambers, 6 Wynyard Street, Sydney.

Page from British-Australian Machinery Co. catalogue. Photo: Courtesy Roger Persson.