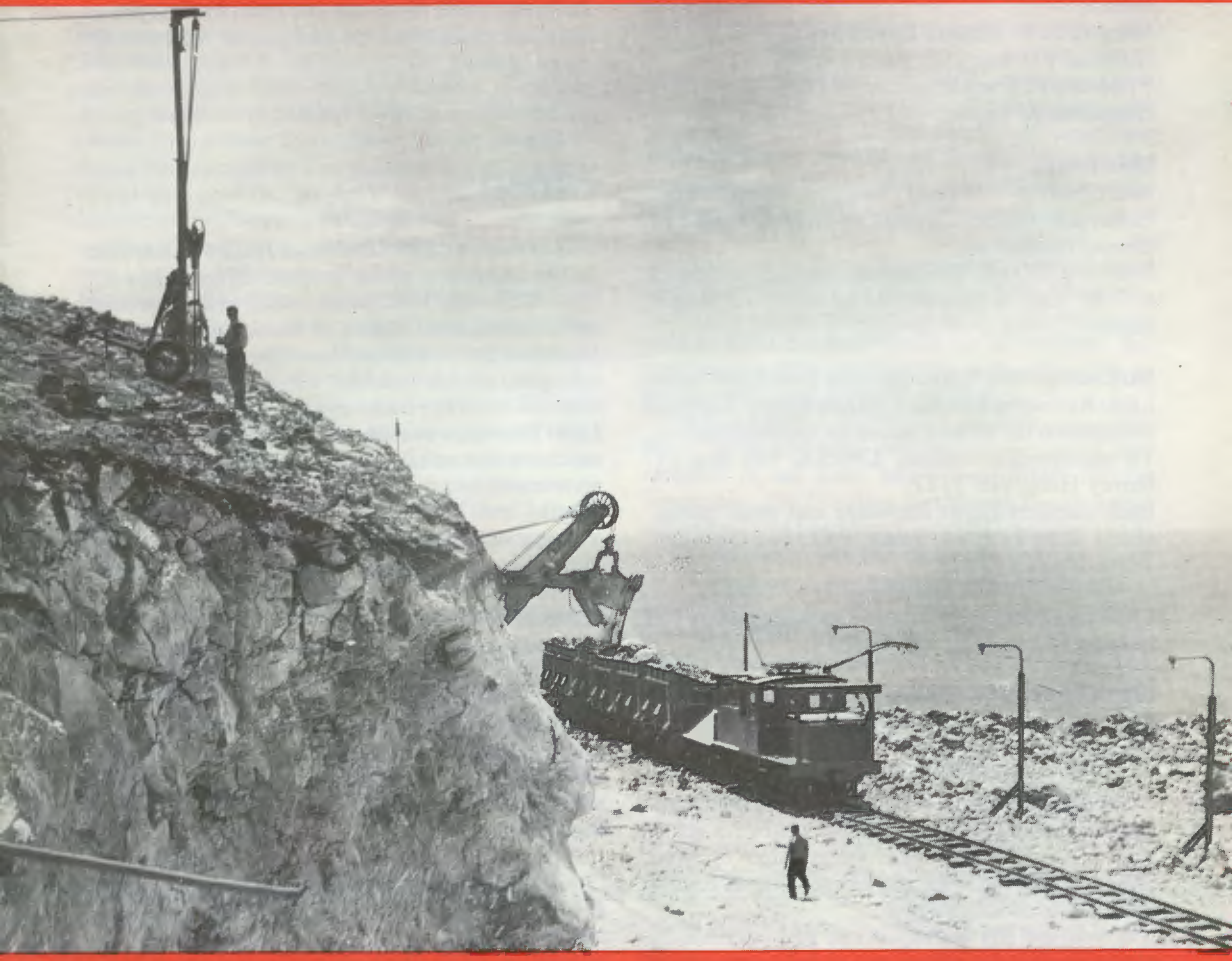
LIGHT RAILWAYS

Number 71
January 1981



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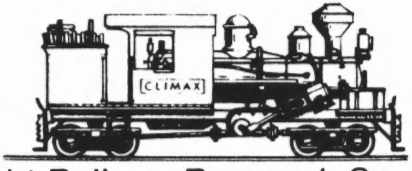

Light Railway Research Society of Australia

P.O. Box 21, Surrey Hills, Vic. 3127

COUNCIL
President, Frank Stamford (830-1640)
Secretary, E.G. (Ted) Stuckey (836-8732)

New South Wales Division
Address: PO Box 290, Burwood NSW 2134
President, Paul Simpson (771-3929)
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Light Railways Editor, Bob McKillop, 10A The Bulwark, Castlecrag, NSW 2068
(Phone 02 95 4516)
Light Railways News Editor, John Browning, P.O. Box 111, Indooroopilly, Qld. 4068
(Phone 07 378 8805)

Whilst every effort is made to ensure the accuracy of articles published in *Light Railways* errors may creep in. Additional information is being discovered all the time, and this sometimes contradicts previous information.

If you see any errors, or can add information, please contact the editor, and so help us to record the full history of Australia's light railways.

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JANUARY 1981
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Articles and news items are always welcome and should be forwarded direct to the editor. It greatly assists if they are typed or written on one side of the paper only and double spaced.

Historical references to sums of money in *Light Railways* are in Australian pounds (£). One pound equalled two dollars on changing to decimal currency in 1966.

Editorial

This issue of *Light Railways* features an article on the tramways of the Delatite River valley by Mike McCarthy. It provides another well researched and detailed local history of timber tramways in Victoria. Such articles have been one of the strengths of this journal. Given the wealth of material on timber tramways which has appeared in *Light Railways* over the years, it is now appropriate that someone take up the challenge to prepare a review article on the role of these tramways in shaping the timber industry and consequently Victoria's pattern of development. In recent years Australian historians have given increased attention to the role played by railways in economic development, but the contribution of light railways has often been overlooked. The ability of sawmillers to efficiently exploit forest resources and economically transport their products was a key factor in Australia's rapid urban expansion late last century, particularly the rise of 'Marvellous Melbourne' as a leading city. An article based on this perspective of economic history would be most welcome in *Light Railways.*

I also welcome a new contributor with David Griffiths' article on the Perry electric locomotives which were used at the Rapid Bay limestone quarry. These locomotives have the subject of some interest in *Light Railways* in recent years (see *LR62* and *LR69*).

Perry Electric Locomotives

by David Griffiths

During the early years of World War II, international shipping was unreliable, and locomotives, which could be shipped, were almost unobtainable. The decision for BHP to commence quarrying limestone at Rapid Bay in South Australia thus presented a problem. BHP had successfully operated four Metropolitan Vickers Bo-Bo electric locomotives at Iron Knob, South Australia since the quarry had been electrified in 1928, and desired to obtain two similar locomotives for its proposed Rapid Bay operation. The solution to the problem of war-time construction was to seek approval from Metropolitan Vickers for construction in Australia by Perry Engineering. A BHP order (No 443) of 4th April, 1940[1] sought to purchase from Metropolitan Vickers 2 sets of 600V DC electrical equipment, and agreed to a royalty payment of 5% on mechanical parts. The 22-ton locomotives carried builders' numbers EL1 and EL2 (*LR* 62, p.15).

Details of the building and operation of the quarry at the time were limited by war secrecy requirements to stating that production of limestone commenced on 13th August, 1942 and the SS *Iron Knob* loaded the first shipment of 55286 tons of limestone from Whyalla.[2,3]

The operation of the quarry was a big 'small time' operation using the most advanced machinery available. The limestone was removed from the quarry, after blasting, by rail transport on a 3ft 6 inch gauge track. One electric shovel was used for loading the stone into side dumping ore trucks. The 3½ yd³ capacity shovel was capable of loading 250 tons of limestone per hour. The side tipping cars tared 14 tons each, and could carry 12 tons of limestone.[4]

Cover: loading limestone at Rapid Bay Quarry.

Photo: BHP Publications Department, courtesy The Australian Geographical Society.

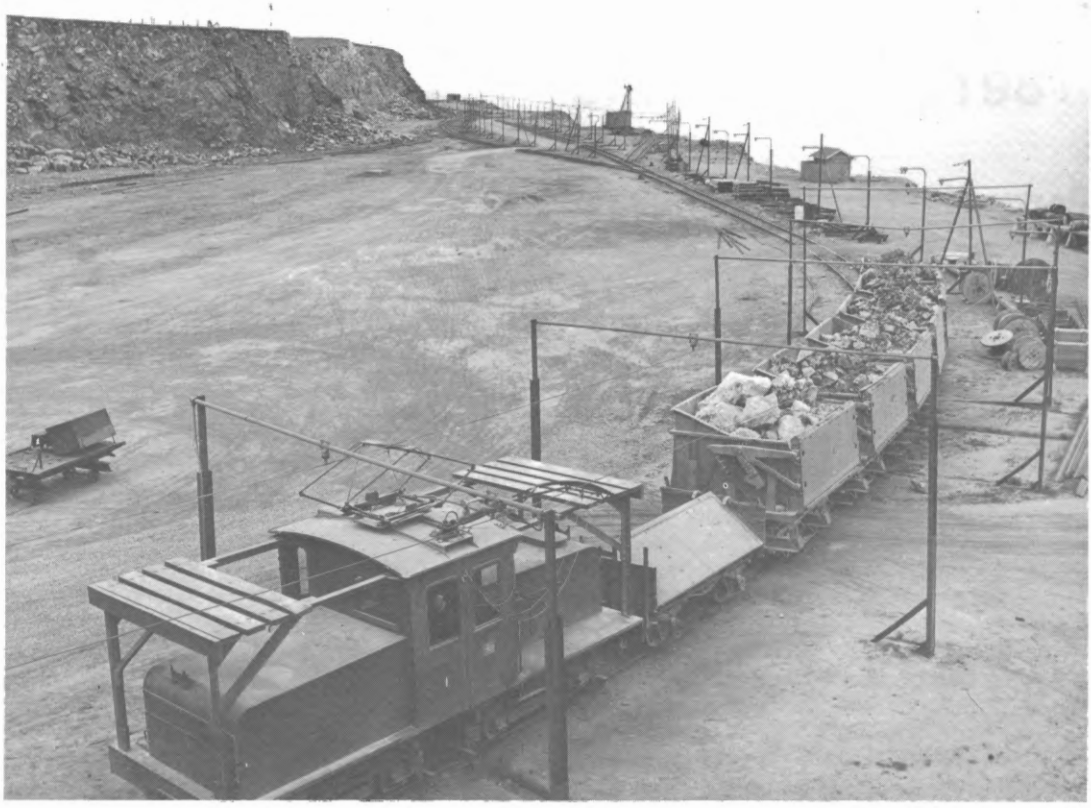
Nine cars in each of two rakes were hauled over 94 lb rails by the locomotives which were equipped with both a side bow and pantograph. The average length of haul was 2,500 ft. At the crushing plant, the trucks were tipped by an overhead crane.

Perry Engineering built two further almost identical locomotives for BHP under a similar arrangement some years later. A memo dated 29th December 1950[5] sought details of price and delivery from the UK, of 2 sets of electrical equipment for 22 ton 600 volt DC locomotives similar to the 1940 order. Metropolitan Vickers agreed on 11th January, 1951[5] to the order and construction by Perry Engineering. A letter dated 14th March 1951[5] to AGE Pty. Ltd., the manufacturer's agents, noted that M.U. equipment at a cost of £290 per loco would not be required, nor would cable reels, and agreed to a royalty of 5% on mechanical parts supplied by Perrys.

Delivery of the electrical equipment appears to have been extended beyond expectation, and resulted in an irate letter from BHP on 1st September, 1952[5] noting that though the electrical equipment had been promised for December 1952, latest estimates put the despatch date as April 1953. The letter did not have the desired effect, apparently, as a letter dated 2nd June, 1953[5] arrived at BHP advising that the electrical equipment would be despatched within 10 days. The electric locomotives were finally commissioned by 24th September, 1954[5] at a cost of £20,505/1/10d for the mechanical equipment.

The future of the electric locomotives was put in the shadow by the delivery of the first diesel locomotive to the quarries - a Clyde G8, in January 1957[6], and as a result of legislation restricting quarry face heights. All rail operation ceased in the Iron Knob quarry on 12th July, 1968. The exact date of withdrawal at Rapid Bay is not known to the author.

Technical details of the locomotives are shown below:



Locomotive E1 at Rapid Bay showing pantograph and bow collectors, offset hoods and a spacer wagon.

Photo: BHP Publications Department.

Motors

One on each axle. Type - standard traction motor, totally enclosed. Motors of series wound, commutating pole traction type wound for operation, connected permanently together, two in series on a line voltage of 600V.

Rating

Nominal, one hour rating is 5.5 HP but arranged two in series in order to reduce the speed to that required, in this case rating of a pair will together be 48 HP. Temperature will be below 65°C. Nominal locomotive 1 hour rating 96 HP. Gear ratio 14:70.

Magnet Frame

Standard tramway type split frame, arranged with usual suspension bearings and bar provided at opposite side from axle bearings, from which motor will be supported by means of suspension springs.

Commutation

Built with best quality of built-up mica, assembly done under high pressure while heated to high temperature. Repeatedly heated and toughened on the Vee rings before the commutation is finally finished.

Brush Holders

Two brush arms provided, on which are mounted the brush holders, are of substantial castings on two insulating rods clamped to supports on the motor frame. Insulation is of Micanton wrapping.

Armature Bearing Housings

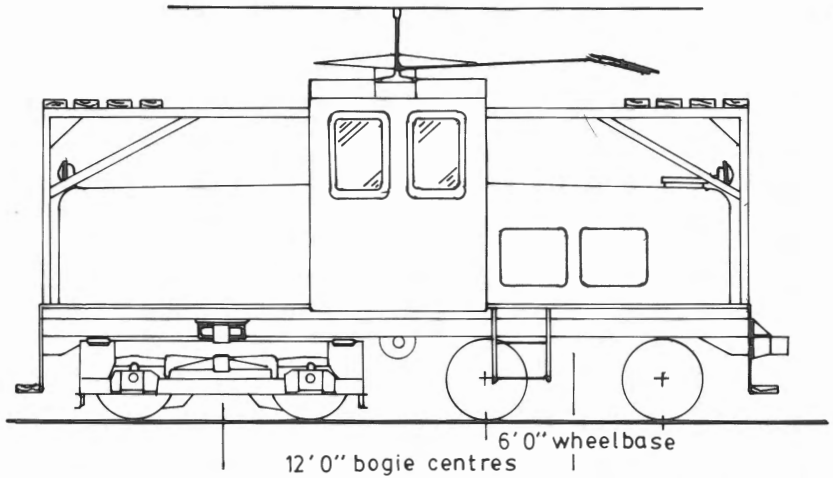
Housings made of cast steel, attached to frame by gripping the two halves of the frame together on the housing, which is made with suitable flanges to hold it sideways.

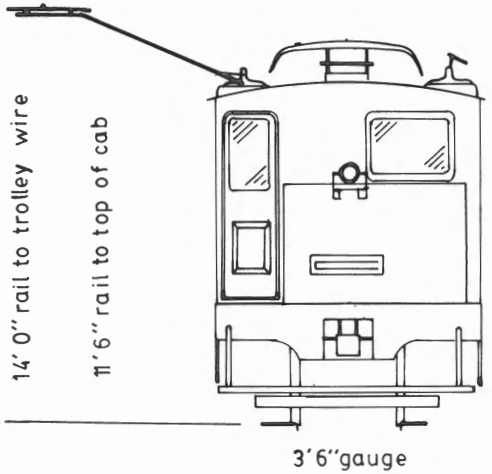
Bearings

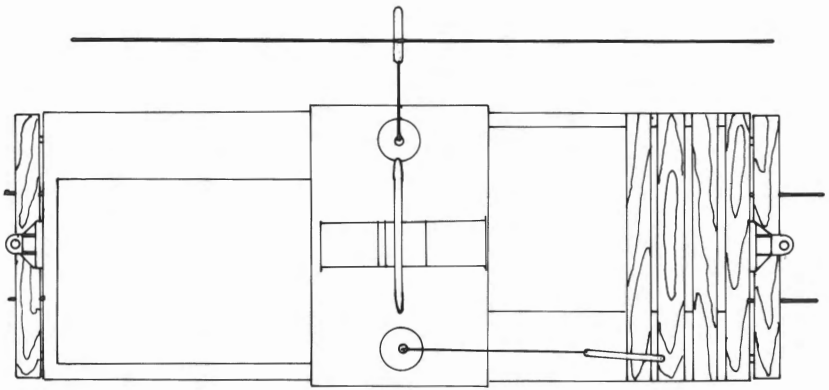
Roller.

Gears and Pinions

Gears solid type forged steel, heat treated after cutting teeth to give hard wearing surface and retain







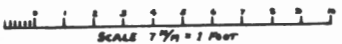
B H P SA

Iron Knob & Rapid Bay

Design — Metropolitan Vickers

Builder — Metro Vickers UK
Perry Eng S Aust

DRAWN for "LIGHT RAILWAYS"
by David Griffiths September 1980



original toughness of steel in body of wheel. Of one piece pressed on with hydraulic pressure, no key. Pinion, taken home to fit armature shaft, with key, secured in position by a nut and locking device. Of high carbon steel hardened after cutting.

Gear Case

Malleable cast iron split horizontally, having two overlapping lids to prevent dust entering case. Arranged for two point suspension.

Control

Electric-Pneumatic system, operated by compressed air cylinders through medium of electrically controlled valves, the valve magnet being excited at low voltage through wire connected to Master Controller in driving cab.

Main Current

Motor current handled by electro-pneumatic contactors and drum type reverser, all operated by pneumatic cylinder.

Overload

Main motors protected by overload device circuit breaker in main circuit and main fuse. Main motor cut-off.

Control System

Of non-automatic type, so that all operation is under the full control of the driver. In addition, a dead-man handle feature is provided on Master Controller, so that if the driver releases his hold of the control handle, it slides up and all circuits are opened and cannot be closed until Master Controller is put back in the 'off' position, when the sequence is to be started up from the beginning.

Master Controller

Drum type with two handles, one for accelerating and other for reversing.

Brake

Westinghouse. Motor driven air compressor. 'Bungalow' type BH25, two cylinders horizontal geared, driven by 5.5 HP motor. Piston displacement 25ft³ free air per minimum crankshaft and motor speed being 200 and 1080 rpm respectively. Motor for 600 volts.

Handbrake

Wheel operated from cab.

Tractive Effort

Total hourly basis 6400 lbs. Speed hourly basis 600 volts 5.5 mph.

References

1. File G27/18A; BHP Archives.
2. *BHP Review,* September 1942, p.7; BHP Archives.
3. *BHP Review,* December 1942, p.8; BHP Archives.
4. *Proceedings Australian Institute of Mining and Metallurgy,* 1952.
5. File G27/18A; BHP Archives.
6. Half Yearly Report, November 1958; BHP Archives.
7. Half Yearly Report, November 1965; BHP Library Whyalla.
8. Illustrated Data Book - BHP; Courtesy National Trust S.A. (Whyalla).

Notes on Drawing

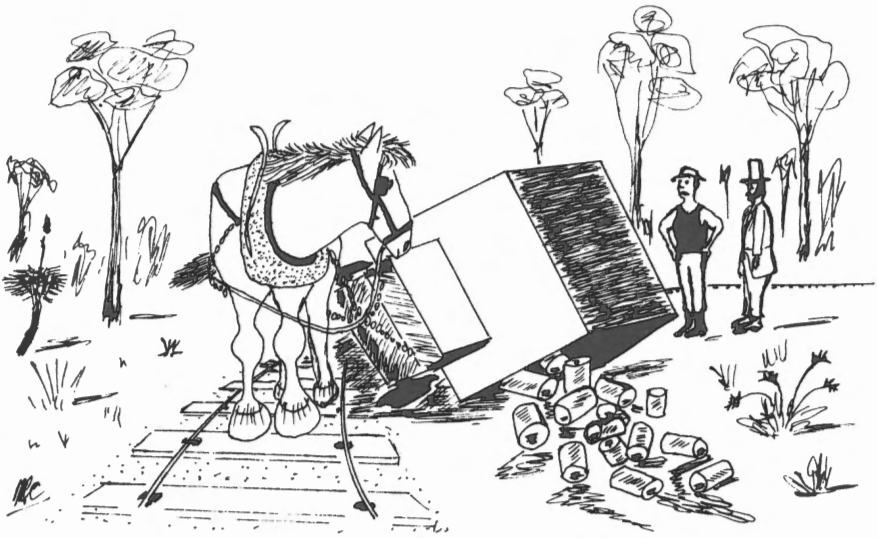
1. Accuracy - Redrawn from Metropolitan Vickers drawing.
2. Sanding gears and sand boxes not fitted to E4-8.
3. Clarion Whistle on E1, 2 and 3.
4. Shunters step on E4 only.
5. Back bracing and planking omitted on left hand of plan for clarity.

THE RISE AND FALL OF THE NORTH PERTH SANITATION TRAMWAY

by I.R. Crellin

Every community depends upon its transport system to provide it with the necessities of life. Food, fuel and water are brought in to the city, and garbage, drainage and sanitary wastes are taken out. Over the years the task has been performed by animal power, then by machine. Light railways have been represented as carriers of many of these necessities at various times, particularly in the supply of food and fuel, but also to a lesser degree as a remover of wastes. One of the most interesting Australian experiments, albeit a notable failure, occured at Perth, the Capital City of Western Australia, in the final years of the last century.

Perth was only a small city in the 1890s, compared to the bustling modern city of today. It was separate and distant from communities such as



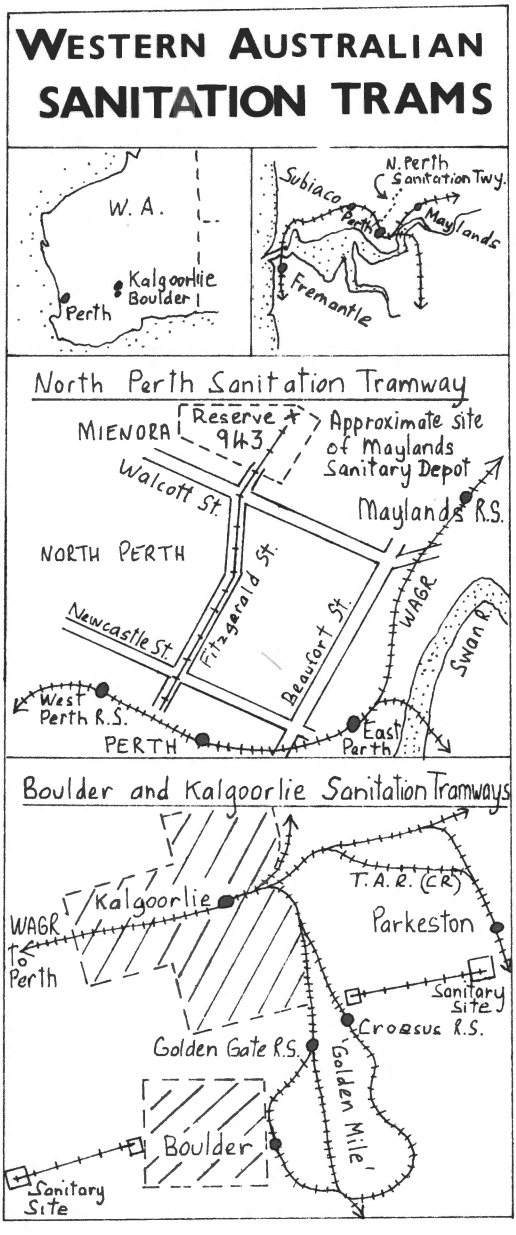
Ian Crellin's impression of the outcome of the trial run on the North Perth sanitation tramway.

Fremantle, Armadale and Midland which today may be regarded as mere outer suburbs of the metropolis. Despite its infancy and small size, the city-fathers were faced with problems of waste disposal, which threatened to get more severe as the city grew with the influx of population and business attracted by the promised riches of the Eastern Goldfields. Health problems were posed by continuing the existing method of nightsoil disposal using covered pans removed by municipal officers or contractors, who subsequently conveyed their cargo by horse-drawn wagon (to the shouts and insults of the street urchins), to a burial site away from the urban area. Deep drainage by a proper sewerage system was the obvious solution, but the cost of such a scheme was prohibitive. A number of interim solutions were tried in the following years; none truely were successful. A tramway into the bush was tried and abandoned. It was replaced by a hydraulic system with a pumping station and pipeline. It subsequently exploded with dire consequences, and a Select Committee of Parliament was set up to investigate the whole sorry business. It recommended a return to the horse and cart as a temporary measure, pending speedy construction of a proper sewerage system.

Construction of the Tramway

In the mid-1890s, the Public Works Department of Western Australia carried out a number of studies and surveys for improvements to the system of disposal of sanitary wastes for the City of Perth. The Estimates and Accounts of the Department showed expenditure in a number of areas. In 1894-95, investigations were undertaken of a proposal for a short line to Subiaco (the area on the eastern edge of the city), and preliminary surveys were undertaken. The sum of £2300 was provided in the Estimates for the next twelve months for its construction. It did not eventuate however, although the 1895-96 Annual Report of the PWD notes that a survey was made for a tramway for nightsoil from Perth to the Commonage Reserve 1½ miles west of Subiaco Railway Station. A second survey was also made to an alternative site at Third Swamp Reserve. The author regrets that he is unable to enlighten his readers as to the whereabouts of the latter site. It would appear that none of these sites on the eastern side of the city were proceeded with, for in the following year, work commenced on the North Perth Sanitation Tramway.

The North Perth Sanitation Tramway was constructed in 1897. It ran from a site near the Perth railway yards, down Fitzgerald Street in a north-easterly direction to the site called Reserve 943, known later as the Maylands Sanitary Depot. Its length was some 2½ miles and it was to be operated as a horse line. The standards of construction were very light. It is reported that rail as light as 8lb per



yard was used in its construction and that, in places, wire nails served as dogspikes. The line was located on the roadway in the city, but was probably sited on its own right-of-way at the eastern end. It was generously ballasted with some 2 inches of ashes!!! No record has been found of the gauge of the line, but the problems experienced with stability of vehicles on the tracks suggest that it may have been 24 inch-gauge, although the possibility of 3 ft 6in cannot be ruled out. It should however be remembered that the design and construction authority (the PWD), was at that time building and operating a number of 24 inch-gauge wharf tramways which probably served as models for this project. The rolling stock consisted of some twenty horse-drawn trucks. The tramway and its equipment was constructed by the PWD and handed over to the Perth City Council in 1897-98. In the same year, the PWD commenced work on a study of the ultimate solution to the problem, the expensive deep sewerage system proposal.

Tramway Operations and Aftermath

It is a sad fact that apart from its construction, where one can presume that trolleys may have been used to convey construction materials, only one official trip was made on the tramway. It was a trial trip under the supervision of the Chief Inspector of the Perth Local Board of Health, a Mr Charles Edward Lee. In the presence of the City Engineer and a City Councillor, the system was to be tested for its suitability and health standards, thoughtfully however with the cans filled with water in view of the occasion! The trip ended in a minor disaster, and the system failed to get its approval from the Board of Health.

Some years later, Mr Lee gave evidence at an Inquiry of a Select Committee of the Legislative Assembly, in which he described the event:

> We had a tramline laid out there some years ago . . . It was intended originally as a horse line, as laid by the Government. There are some 8lb rails and some 10lb rails. They used wire nails for dogs in some instances, and it was ballasted with about two inches of ashes, and really in a very bad state from the start . . . I had to report it was impossible to use the line. The late Councillor Patterson and Mr Deverell, the City Engineer, and myself, and some other gentleman (Mr George, I think), went out to have a trial trip. One horse was put onto a car. We filled the pans with water. When the car got to the curve, it capsized. That was the last of the tramway.

History does not record the fate of the scheme's supporters, but we can imagine that they were the objects of jokes and ridicule for some time. Not dismayed however, the Perth City Council set about constructing a pumping station and pipeline to move the wastes from the city collection depot to the disposal site. The populus of the city did not entirely embrace the new scheme with enthusiasm.

Odour problems were noted, particularly understandable when one considers that any item which failed to pass through the sceens at the pump-entry was simply shoveled into the pumphouse furnaces. After some time, a pipeline fracture occured within the residential area causing severe health and pollution problems. The hydraulic system thus joined the tramway in ignominy.

Public outcry at the failure of the two schemes, and disquiet at the existence of the disposal site on the margins of the expanding city, brought about moves in Parliament for an investigation. This resulted in the appointment of a 'Select Committee of the Legislative Assembly Appointed to Consider the Question of the Removal of the City Sanitary Depot from its Present Position and to Recommend a Suitable Site for Such Purposes'. The Committee took evidence on the past schemes and on proposals for the future. Mr D. Munro, Chairman of the North Perth Roads Board, gave evidence on the past:

> In the face of the agitations we had in the district, a tramline was laid down in Fitzgerald Street. That was an absolute failure. They did not use the line at all for the transport of nightsoil... and the pumping station was erected.

The evidence of Mr Lee of the Perth Local Board of Health, referred to in the preceeding paragraphs was also given on that occasion.

Despite the failure of the earlier tramway scheme, there was no shortage of advocates of the use of railed transport to solve Perth's sanitary waste problem. Both WAGR and the Municipal Tramways were suggested as possible carriers. Neither were enthusiastic however. Argument on the public health benefits of proper sewerage systems carried the day, and the committee reported as follows;

> ... Committee has no objection to the continued use of Reserve 943 as a sanitary depot subject to satisfactory transport of pans to the site ... pumping station closed... recognises that it is a temporary solution pending deep drainage.

That was in 1901. It took several years before the sewerage scheme was implemented. Contracts for the sewerage works were let in 1907, and by the outbreak of the First World War in 1914, the city was substantially sewered. The North Perth Sanitation Tramway was by then a sad memory and a severe embarrassment to the authorities who must have wished that they had implemented the ultimate solution from the outset.

Other Sanitation Tramways in Western Australia

Although there may be others, there were at least two additional sanitation tramways in Western Australian towns. Although the author has no first hand knowledge of these lines, they are clearly documented on Lands Department maps of the earlier part of this Century. They were on the Eastern Goldfields at Boulder and Kalgoorlie. The first ran westward from a depot on the outskirts of Boulder for some 12 miles, to a disposal site adjacent to the Magazine Reserves which served the mines of the goldfields. The second, which served Kalgoorlie, ran for a distance of some 1½ miles from a depot near Croesus Railway Station on the Brown Hill Loop (WAGR), in an easterly direction to a disposal site near the Trans Australian Railway, a short distance south of Parkeston. The location of these lines are shown on the accompanying map.

I would be particularly interested to hear from any WA readers who have any further information on the operation of these lines. While nothing remains of the North Perth line in the built-up areas, there may be a remnant of earthworks at the Maylands end (which I am informed is still a municipal reserve of some description). It is possible that some evidence remains at the sites of the Boulder and Kalgoorlie tramways.

The Tramways of the Delatite River Valley

by M.J. McCarthy

INTRODUCTION

The Delatite River is located in central Victoria near the town of Mansfield approximately 200 kilometres north east of Melbourne. The river is not a long one by any standard, flowing 90 kilometres from its source, on the northern and eastern slopes of Mount Buller, to Lake Eildon where it joins the Goulburn River.

The Delatite Valley has never been settled to any great extent. In the 1850's attempts were made to clear some allotments in the Merrijig area but the efforts usually resulted in failure, the land reverting to scrub within a short time.

Although virtually the whole area was forested, it was largely of a poor standard, and it was not considered to be of value as a milling area until the 1930's when the Toombullup territory to the north had been largely cut out, and a new source of timber was needed for north east Victoria. The Otways and Gippsland, Victoria's two prime sources of timber, were too far distant to be regarded as viable economic providers of timber for this region.

The principal species of timber found in the area are narrow-leaved peppermint, blue gum, messmate and candlebark with alpine ash in the higher zones, particularly in the vicinity of Mount Buller and Mount Timbertop.

Roads into the area were virtually non existent prior to the 1930's, a rough track from Mount Buller being the only access route to the upper reaches of the Delatite River. With the arrival of the sawmillers and the development of Mount Buller as a snow resort in the mid 1930's, the track was improved into a serviceable road.

Three firms established mills in the region in the 1930's. The development of motor trucks and the availability of good all weather roads made timber outlet tramways unnecessary, but all three mills were served by log tramways. The first mill to be established was that of Paul Christensen followed by McCashney and Harper and then Carter Bros. Pty. Ltd.

Delatite Sawmilling Co. Pty. Ltd.

In 1935 Paul Victor Christensen established a sawmill on the Delatite River at its junction with Buller Creek. The settlement which grew around the mill was named Mirrimbah by Christensen after the Crown Parish within which it was located. The town of Mansfield 17 miles to the west of Mirrimbah was the main outlet for Christensen's timber, which was forwarded by rail to markets in both Melbourne and north-east Victoria.

Christensen was an experienced miller. He had previously been involved in sawmilling at various sites around Orbost and Nowa Nowa in Gippsland before joining with the Saxton brothers in a sawmilling enterprise in the Erica district. In 1935 he left Erica and established his own mill on the Delatite River trading as the Delatite Sawmilling Co. Pty Ltd.

In the forties, Paul Christensen went into semi-retirement leaving the day-to-day running of the mill to his son Bill. Christensen senior however, maintained a close interest in the mill, handling the financial/business side of the concern from his home in Melbourne. This situation continued until the mill was sold to Marbut Mouldings Pty Ltd. in 1950.

The mill was powered by a semi-marine dry back boiler and a twin cylinder steam engine fitted with a twelve foot flywheel. The engine, boiler, and much of the mill plant had been obtained from the idle Australian Jam Co. (AJC) sawmill in the Murrindindi district in Central Victoria. Apparently the engine had once formed part of a power unit driving the cables used by Melbourne's cable trams. A waste timber tramway of about 150

Delatite sawmill prior to the 1939 fire.
Photo: W. Christensen.

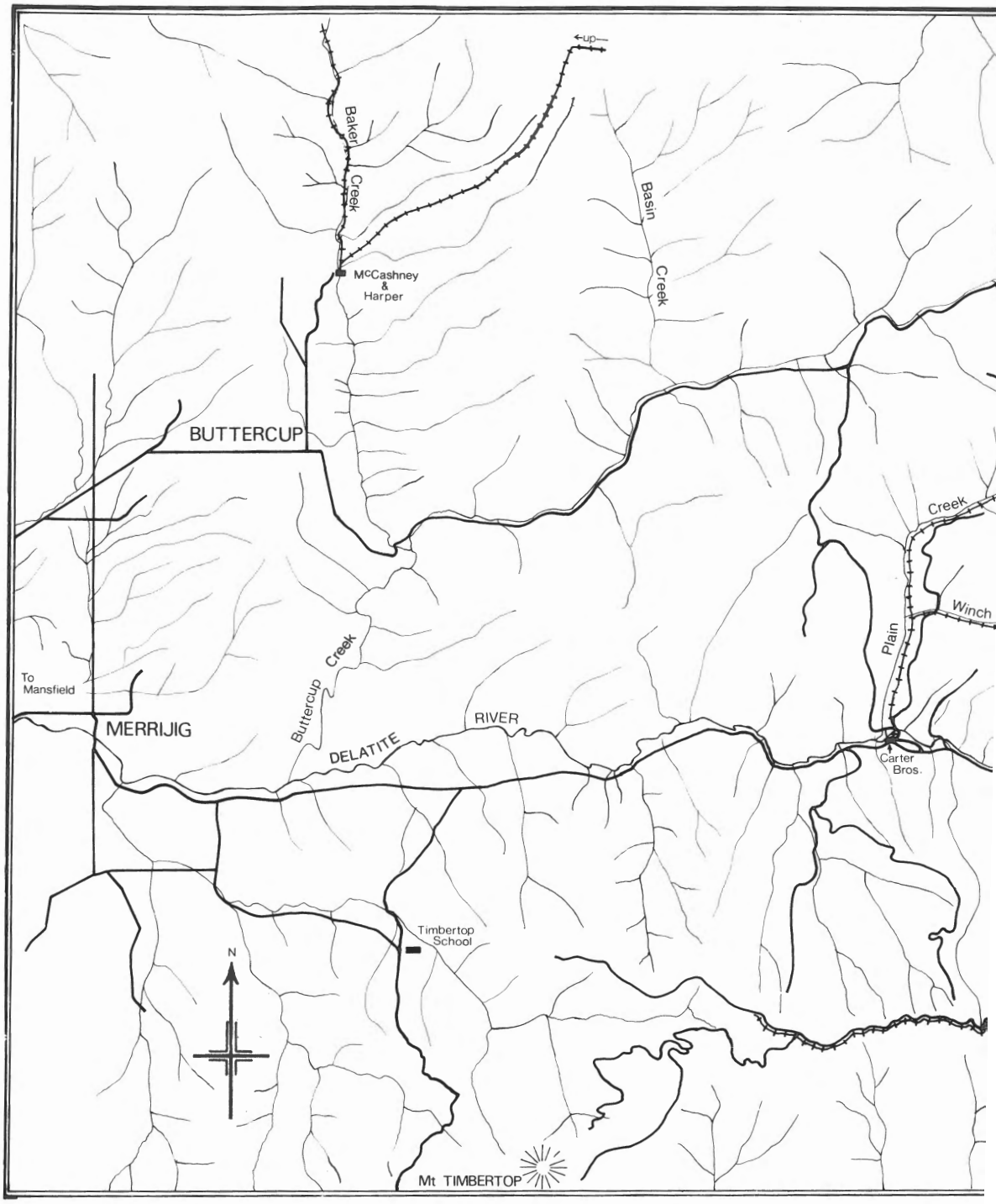
metres in length, ran from the west end of the mill shed. The line was laid on a grade to allow the truck carrying the edgings to gravitate down to the edging pit where the scrap was burnt. The truck was hauled back to the mill by a winch.

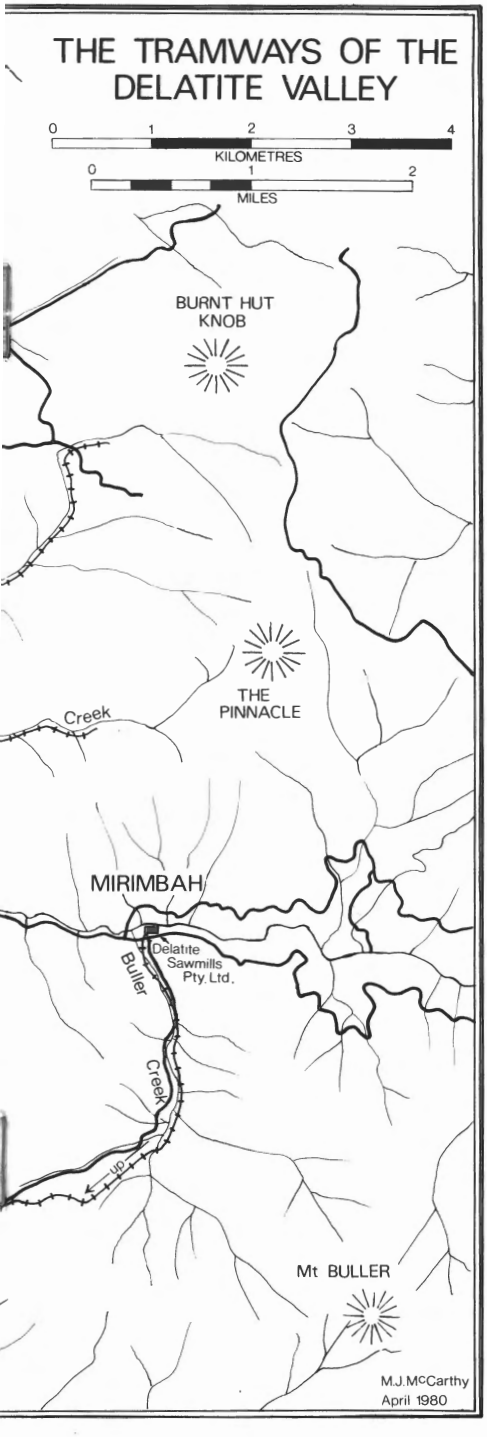
Perhaps influenced by his experience with the Saxton brothers at Erica, Christensen powered much of the equipment in the mill and workshop by means of pelton wheels. These were driven by water delivered under pressure to the mill by way of a pipeline from a dam on the hill side above. Electric power for the mill was also generated this way, much of the generating plant coming from the Latrobe River Electricity Supply Company's hydroelectric plant at Noojee, which had supplied power to the Goodwood Timber Company.

The logging area that had been allotted to Christensen lay mainly up the Delatite River to the east of the mill and in 1935 he began construction work on a road to extract this timber. Logging commenced about a year later with a newly purchased Chevrolet truck and a Malcolm Moore log jinker. Some logs were snigged from the immediate mill surrounds by a Harman winch located in a shed at the mill. This winch along with another Harman winch had also come from the old AJC mill.

The Tramway

The summer of 1938-39 was one of the hottest and driest on record. The severity of the conditions coupled with gale force northwinds led to the most destructive bushfires the State had witnessed, and approximately a third of Victoria was burnt. The Delatite River Valley, although threatened by the fire, escaped almost unscathed due to a sudden change in the wind. The threat however, was strong enough to warrant the evacuation of the residents of Mirrimbah to Mansfield where they were billetted in the empty Coffee Palace. The sudden change of wind saved the mill, but much of the bush to the south between Mount Buller and Mount Timbertop was destroyed.[2] The Forest Commission, anxious to salvage as much of the burnt timber as possible, directed Christensen to temporarily abandon





logging along the Delatite River and shift his fellers to the burnt area to the south of the mill.

Christensen constructed a road running up Buller Creek for about 2 miles, and commenced carting logs using the Chevrolet truck. The area was considerably rougher and steeper than the previous logging area, and it was not long before it was found that the motor truck was not up to the task. The well proven method of log extraction by tramway was the only viable answer.

A trip to the Otways by Christensen resulted in the purchase of a quantity of steel rails and 3ft 6in gauge wheel sets. By this time, a Caterpillar crawler tractor with a bulldozer blade had been purchased, and this was used to form the road bed for the tramway.

Logging operations commenced from a log landing about ½ mile up the tramway from the mill. As the logging progressed to the south, the tramway was extended. George Shaw, who had previously worked for Skinner, a sawmiller at Alexandra, was in charge of tramway construction. The main line in this section was laid mostly with wooden rails.

The Incline

Approximately 1¼ miles up the tramway from the mill, a siding was laid to a log landing. A short distance past the siding, a tramway crossed Buller Creek and came to the bottom of a steep rise separating the watersheds of the Delatite and Howqua Rivers. A three-railed balanced incline was laid up this rise. Loop sidings were provided at the summit and at the base of the incline to allow loaded trucks to pass the empty ones. A passing loop, common in most balanced inclines, was installed at the half-way mark.

The incline was constructed around the middle of 1940, the lowering gear having been purchased from a mill at Marysville where it had been used for a number of years. The first load of logs was sent down on or about the 15th September 1940, and to all appearances the gear functioned perfectly.

On 25th September, 1940 Mr and Mrs Kofler, the proprietors of the Mount Buller Chalet in the company of K. Jones, a relative of one of the mill workers, and Bill Christensen, the mill manager, were travelling up the incline on a sightseeing trip. The truck on which they were travelling was being hauled up the incline by another truck coming down. Unfortunately the weight of the log truck proved too heavy for the gear to handle. The brakes on the lowering gear failed, which allowed the log truck to career uncontrolled down the hill, hauling the other truck with the occupants on board up the incline at a very dangerous speed.

The Koflers were sitting on the front of the truck, Jones and Christensen were seated at the rear. The trolley raced over the top of the incline and smashed into a stationary truck, killing the Koflers instantly. bill Christensen was thrown off the truck seconds before impact and narrowly escaped serious injury. However, Jones was thrown down an embankment by the force of the smash, and a couple of days later, died from injuries received in the accident.[3]

Following the accident, the lowering gear was scrapped and replaced by a much larger more powerfully braked gear which used two separate ropes, one winding and the other unwinding, to eliminate any chance of a repeat of the September disaster. The new gear was constructed from a winding apparatus purchased from a Bendigo mine, and altered to suit Christensen's needs by Johnsons Tyne Foundry of Melbourne. The new equipment was extremely well braked, having four big shoes which clamped onto a 2 metre diameter brake drum, as well as having the two separate ropes for raising and lowering. The mill was closed for four weeks following the accident during which time the new lowering gear was installed.

Lowering gear at the top of the incline c1941.

Photo: W. Christensen.

Destruction of First Mill

Operations were due to start again on Monday 21 October 1940, and with this in mind, the boilers were lit on the Saturday nigh to ensure a good head of steam for Monday. Close to midnight the boiler attendant noticed a fire had broken out in the rafters of the mill shed in the vicinity of the boiler. Apparently, sawdust had accumulated on the beams and a spark had set the dust alight. Although prompt action was taken, the fire quickly took a hold and within minutes the whole shed was alight. The mill shed was completely destroyed, and only the lack of a breeze prevented the fire spreading to the workshop, winch hut and houses nearby.[4]

The mill was rebuilt with a skillion roof rather than the gabled structure which had been used before. Most of the equipment had been destroyed in the fire, the boiler being the only major component salvaged. A new Bellis and Morcom vertical compound engine and a step grate dutch oven to burn sawdust from the benches were fitted in the rebuilt structure.

Tramway Extensions

By 1944 a further 2½ miles of tramway had been laid from the top of the incline. Five log landings were established along the top section of the line which was laid entirely with steel rails. The first was about a kilometre past the lowering gear and consisted of a log platform positioned beside the main line. A second landing served by a run-around loop was located about 400 yards past the No. 1 landing. A siding was laid a mile past the No. 2 landing, leading to the No. 3 landing or the *Big Landing* as it was known.

The *Big Landing* was positioned on a saddle between the Delatite and Howqua Rivers, and logs were hauled to it from both sides of the track by an Allis Chalmers crawler tractor. Where as most of the other landings used by Christensen were generally abandoned after working through the area, the siding to the *Big Landing* was often used after the main cutting area had moved westward. If the other landings became too wet and muddy to use, operations could be shifted back to the *Big Landing* until conditions improved.

A short distance past the *Big Landing* siding, the tramway passed over a bridge supported in the centre by a 5 metre high crib support. Landing No. 4 was located about half a mile past the bridge. This landing was not in use for very long and consequently a loop siding was not installed.

The line terminated at landing No. 5 where a loop

Christensen's tramway at No.2 landing. The huts under construction are for the bush workers.

Photo: W. Christensen.

Top of the incline, Delatite Sawmills.

Photo: W. Christensen.

'Pig sty' bridge under construction between The Big Landing and No.4 landing.

Photo: W. Christensen.

siding was laid to allow the tractor to off-load the empty bogies, and pick up the loaded trucks.

Tramway Operation

The bottom section of the line was worked with a tractor hauling the empty trucks from the mill to the bottom of the incline, and then trailing behind the loaded truck as the load rolled down to the mill.

Because of the falling grade, only one man was needed to operate the locomotive and control the trucks. The tractor would be put into neutral gear and attached behind the load to follow merrily back to the mill. The driver, normally Arthur Brunsden, controlled the brakes on the trucks.

The top line was worked by another rail tractor. This section was laid on a more or less level grade and, as such, some hauling or pushing had to be done. Where a landing was not equipped with a loop, the tractor would haul the empty truck out and then push the loaded truck back. Two men were needed to operate the top section of the tramway. One man, usually Tom Gardiner, drove the tractor while his brakeman, Robert Ware controlled the trucks. The top crew were also responsible for operating the lowering gear.

Rolling Stock

To work the tramway, Christensen built a total of five tractors, only three of which existed at any one time. Four of these tractors were log haulers, the other being a small motorised trolley for transporting men over the line.

As the first rails on the tramway were laid, work had also commenced on the construction of a rail tractor to haul logs on the line. Sometime earlier, an International tip truck had been purchased from the Shire of Mansfield for use in constructing logging roads into the bush to the east of the mill. This solid rubber wheeled vehicle was to form the basis of Christensen's first rail tractor.

The engine and much of the cab from the truck were mounted on a frame supported by two four-wheeled bogies. The drive shaft from the engine drove the front axle of the rear bogie. Power was

transmitted to the other axle by means of a chain connecting sprockets mounted on the hubs of the wheels. The gearbox from the International was also fitted. A cab, roofed with corrugated iron, afforded the driver some protection from the elements, although the four open sides must have guaranteed a chilly trip in the middle of a Mount Buller winter.

Although the first tractor was reasonably successful, it was basically an experimental model and was used for only a short period. Late in 1939 Paul Christensen's son, Bill, by now the manager of the mill, rebuilt the locomotive using the engine from a First World War ex-army Leyland truck. Due to World War 2, which had just begun, new motor trucks were in short supply. Christensen snr. had come across a dozen of these vehicles for sale and snapped up all twelve (cheaper by the dozen). His move was perhaps shrewder than even he thought, as he was able to resell one of the trucks to another timber firm for about the price he had paid for all twelve.

The second tractor was very similar to the first vehicle with the exception that it had no canopy for the driver, and it was powered by the Leyland engine. It replaced the first tractor on the bottom section of the line prior to the construction of the incline.

After the incline had been installed and construction had commenced on the top section of the line, another haulage unit was needed. Bill Christensen constructed a third tractor using a Leyland power unit. This time all wheels on both bogies were powered through a common gearbox driving both front and rear bogies through tail shafts. The two inner wheels of each bogie were of a smaller diameter than the outer wheels. This allowed the drive shafts to clear the inner axles to run to a universal joint located beneath the bogie centre pin. A short shaft ran from the joint to the outer axles where power was transferred to the wheels via a crown wheel and pinion attached to the axles. The two inner wheels were driven by sprockets and chains on the outer wheel hubs. The normal Leyland four speed gearbox was supplemented by an additional gearbox which contained only two gears, forward and reverse. This effectively gave the same number of gears available

The first tractor working on the bottom section of the line.
Photo: W. Christensen.

Christensen's third tractor carrying a temporary title..

Photo: W. Christensen.

when travelling in either direction. The rear of the tractor sported a flat tray which was used for carrying men and equipment, as well as petrol for the tractor, and Trewella jacks used to rerail the tractors when necessary. Derailments, incidently, were rare.

The third tractor was successful from the day it commenced running. The eight-wheel drive provided excellent traction on the top section, which unlike the bottom line, was relatively level, requiring haulage power in both directions. Immediately on placing this tractor into service Christensen set about building another similar unit to take over the running of the bottom line.

The fourth tractor was very similar to the previous unit, with the exception that all the wheels were of the same diameter, the drive shaft connecting directly with the inner axles of the bogies. Power was transferred to the other wheels by side rods rather than chains as had previously been the case.

Close by the No. 2 landing, two huts were built to house the bushmen during the week, the alternative being a long walk to work each day from the mill at Mirrimbah. To carry these men from the huts to the logging area, and also to transport the platelayers to the end of the line, Christensen built a small man-carrier powered by an engine from a 'T' model ford. This vehicle was basically a four-wheeled bogie with an engine mounted upon it. Connected permanently behind the bogie was a small two-wheeled trailer upon which the men rode.

The Community

Prior to the 1939 bush fires it was common for a small settlement to spring up around a bush mill. At Christensen's mill, a boarding house and about a dozen huts housed the mill workers, while a general store/post office was established by Keith Grant, a dental mechanic from Melbourne. Even in 1937 Mount Buller, a few miles to the east of the mill, was a popular skiing area during the snow season. Grant was able to pick up a good deal of passing trade on the way to the snowfields in addition to the custom afforded him by the residents of Mirrimbah. Many of the houses made good use of the excellent water pressure available to generate electric power for their own household use. One such case was Rolland Crozier who had tapped his water supply from the pipe feeding the pelton wheel in the mill workshop. The force of the water drove a pelton wheel generator at his home, providing enough electricity to power the 12 volt 40 watt lighting system he had installed.

The Upper Delatite School was established midway between Mirrimbah and Carter's mill a couple of miles to the west, to serve the two sawmill settlements. Following the closure of Carter's, the school was shifted to Mirrimbah and took up that name.

Line Closure

The tramway was used until 1946 when the Timbertop area was cut out. The line was dismantled immediately, most of the steel rails being sold to the PMG for use as telephone poles. The two remaining Leyland tractors were sold to Clarke and Pearce at Rubicon in about 1946. However it is believed that the locomotives saw little use, if any, at Rubicon.

The 2nd tractor (the first Leyland) was probably scrapped at the mill around 1940, although some

The second tractor at Mirrimbah.

Photo: W. Christensen.

sources suggest that it may have gone down to the Otways around that time. The man-carrier was scrapped at the mill after 1946.

After Christensen had finished logging to the south of the mill, he shifted his operations back up the Delatite River. Over the previous few years, Bill Christensen had been extending the road up the river in his spare time. Once logging shifted back to this area, all transport was performed by motor trucks. In 1950 the mill was sold to Marbut Mouldings Pty. Ltd.

Today Lands Department maps show the location of the settlement of Mirrimbah, but if you pass through on your way to Mount Buller, you will find that the township has all but vanished, although the site is marked by the Forests Commission toll point closed in 1973, having retained its steam power right to the end. A Forests Commission road has been constructed leading to the south from Sawmill Settlement, two kilometres west of Mirrimbah. This road passes through much of the area through which Christensen's tramway ran. The remains of pig sty tramway bridges can be seen alongside this road on the ridge connecting Mount Buller and Mount Timbertop.

McCashney & Harper

In common with many of the larger sawmilling concerns operating in the 1930's and 1940's, the firm of McCashney and Harper could trace its origins to what was arguably the birth place of Victorian sawmilling, the Wombat Forest, east of Daylesford in Central Victoria. In 1916, William Henry McCashney shifted his mill from the Wombat forest to the Toombullup district south of Tatong, where he teamed with John Harper and milled the area until it was cut out in 1936.

Early in 1937 the mill was shifted to Baker Street at Buttercup[5] 13 miles east of Mansfield. The mill was connected with Mansfield by a good graded road which precluded any necessity to use tramways for sawn timber transport, but two 3ft gauge tramways were constructed to bring logs to the mill.

Construction work on the first line commenced in 1937, after a survey which followed a steeply graded route to the north east of the mill had been pegged for about a mile.

The mill at this time was logging mostly in messmate country. The firm employed an 8 hp Fowler traction engine and a horse-drawn jinker on log hauling to landings on the tramway. Originally, two Fowler traction engines were brought down from the Toombullup area, however it appears that only one was used.

Tramway

By late 1939, the tramway stretched three miles from the mill onto the ridge separating Baker Creek from Basin Creek to the east. Part of the sawmilling area allotted to McCashney and Harper lay in the upper reaches of Basin Creek, and to tap this timber, an incline was constructed down into the valley in 1940.[6]

The tramway terminated at the bottom of the incline where a large log hauling winch was located, the incline winch being at the top of the haulage. The line from the top of the incline leading across the ridge was worked by two horse teams hauling one truck each. The horses would be detached about halfway back to the mill, and the trucks would then gravitate over the remaining distance. The final section of line leading down to the mill was quite steep, so old winch ropes were attached behind to provide some drag resistance to the descent. If this measure was not taken, the drivers would find the trucks almost impossible to control on frosty mornings when the rails were covered with ice.

The Basin Creek log line was used until about 1943 when the area to the east of the mill was cut out, and construction commenced on a tramway to the north following Baker Street.

The Baker Creek tramway was surveyed by Charlie Waters, a long time employee of the firm. The line followed an easy grade up Baker Creek for about 2 miles crossing the creek several times over its length.

Because of the easy grade, horse haulage was necessary in both directions on the tramway.

Log transport by tramway ceased in about 1947 when road vehicles took over entirely. Prior to this, probably during 1945 and 1946, the line was used only during the winter months when, owing to the deplorable state of the roads, motor transport was out of the question.

The mill operated at Buttercup until 1950[7] when it was shifted to Barjarg, north west of Mansfield. It remained there until 1972 when it was destroyed by fire.

Carters Benalla Pty Ltd

In 1938 Carter's Benalla Pty Ltd established a mill on the Delatite River at its junction with Plain Creek, a little over a mile to the west of Christensen's mill at Mirimbah.

Carter's was a timber and hardware firm with a large store and yard in Benalla. The proprietors of the firm also operated a mill and timber yard at Gardenvale (Vic.) under the name of E. Carter Pty. Ltd. The mill on the Delatite was an unusual move

for the firm. Although the Company had been involved in sawmilling in the north-east of Victoria before 1938, it was the firm's practice to have a financial interest in a concern rather than be the establishing company. Although the mill was on the south side of the Delatite River, the milling area lay to the nroth along Plain Creek and included the headwaters of the Buttercup Creek. Two major land features were found in Carters area, Burnt Hut Knob (4400 ft) and The Pinnacle (4700 ft).[9]

The mill was powered by an underfired multi-tubular boiler and a horizontal single cylinder engine. The timer produced was despatched by motor truck to buyers in the Benalla area.[10]

Tramway

In 1939 after some initial snigging had been done from the bush immediately to the north of the mill, the company began constructing a 3 foot gauge wooden railed tramway across the Delatite River and up the east side of Plain Creek. This horse-hauled line was extended for about 3 miles up the creek and terminated below Burnt Hut Knob. In about 1941 a branch line was laid running up Winch Creek about a mile to the north of the mill. The branch was about a half a mile long, and was constructed to tap the timber along the Creek and from the western and southern slopes of The Pinnacle.

On the Winch Creek branch, the winch was positioned at landings on the tramway, the logs being snigged down from the valley sides. This was a departure from the normal practice of winching either across or up the grade.

Owing to a war-time shortage of labour, the mill closed down late in 1942. For three years the machinery lay idle. In 1946, after hostilities had ceased, Carter's leased the mill to Harold Doughty, who had formerly been the proprietor of a mill at Tolmie. Doughty continued to work the mill until 1956 when Carter's again took over the running of the mill.

Doughty used the tramway for only a short period. He replaced the tramway bridge over the Delatite with a more substantial structure, and converted the tramway formation into a road. Logs were then carted by motor truck. After 1956 Doughty opened his own mill (The Pinnacle Mill) close to Carter's, and operated there for a number of years.

The site of Carter's mill is marked today by the small gathering of houses on the Mount Buller road called Sawmill Settlement.

Acknowledgements

I would like to thank the following people who assisted me in compiling this article, Bill Christensen, Rolland Crozier, Mrs. M. Dent, Harold Doughty, Mrs A. Harper, Ted Stuckey, Charlie Waters and Jim Westcott.

Reference

a) Introduction
1 - Forests Commission of Victoria.

b) Delatite Sawmilling Co.
Most of the information was provided by Bill Christensen, former manager and owner of the mill. Rolland Crozier, a former employee of the firm, also assisted.
Other references are as follows:
2 - *Mansfield Courier* 20 Jan. 1939
3 - *Mansfield Courier* 27 Sept. 1940
4 - *Mansfield Courier* 25 Oct. 1940

c) McCashney & Harper
Charlie Waters supplied most of the information on this mill and tramway. Charlie was employed by McCashney and Harper for approximately 30 years from about 1920. Other information was provided by Mrs. Ada Harper.
References are as follows:
5 - Forests Commision of Victoria
6 - Forests Commission of Victoria
7 - Forests Commission of Victoria

d) Carter's Benalla Pty Ltd
Harold Doughty, a former manager of the mill provided most of this information.
Other references:
8 - Forests Commission of Victoria
9 - Forests Commission of Victoria
10 - Forests Commission of Victoria

THE WALKERVILLE LIMESTONE JETTY TRAM

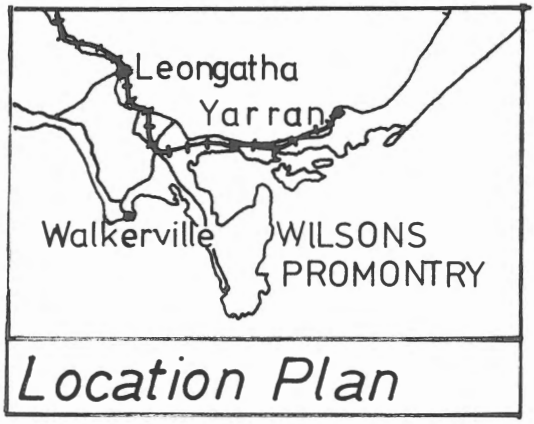
by Norm Houghton

On the coast of Gippsland and west of Wilsons Promontory is the tiny settlement of Walkerville on Waratah Bay, now a holiday resort, but at one time the focus of a flourishing lime-burning industry.

In July 1980, the author motored along the many miles of dirt road to Walkerville to see if any relics, including tramway ones, survived. Inspection revealed that substantial remains of the lime kilns were intact, along with one set of jetty piles and, surprisingly, several lengths of corroded tram rail were lying on the foreshore.

The limestone deposits along the cliffs at Waratah Bay were first exploited by William Miller of Yanakie Station in 1875. Miller located the deposits and was alive to the commercial possibilities of lime for use in Melbourne building works. In that year he took out a quarrying licence and built a kiln against the cliffs fronting the foreshore.

Two other men were active in the trade at the same time as S. Ulrich and Joseph Reed also took out quarrying licences at Waratah Bay.



Location Plan

These pioneers did not remain for very long, and by January 1877 the trade had passed into the hands of the Waratah Bay Lime, Marble & Cement Co. Mr W.F. Walker of Melbourne had a leading

Walkerville kilns c1926.

Photo: Walkabout magazine.

Same view in July 1980. The remains of the kilns and jetty piles are clearly visible while old rails are still present on the beach near the centre of the photograph.

Photo: Norm Houghton.

View from the jetty looking back at Walkerville settlement.
Photo: Walkabout magazine.

interest in the Company, hence the origin of the settlement's name. The Company began work on a large scale, opened four quarry sites on Crown Allotments Nos. 1 to 4, Waratah Bay Parish, and constructed another five kilns along the foreshore at the base of the cliff.

The kilns were made of local bricks faced with stone, and were 60 ft deep. The limestone was conveyed from the quarries in horse-drawn carts, deposited into the kilns, burnt, and the finished product drawn from the bottom and packed into bags.

The bagged lime was despatched to Melbourne by sea because of the area's isolation and lack of adequate communication with the hinterland. The Waratah Bay Company obtained a jetty licence in 1877, so presumably Miller, Ulrich and Reed used some means other than a jetty to load ships. The jetty was constructed of timber. It commenced at the kiln area and stretched some 500 yards into the Bay, curving at the end to avoid shoals.

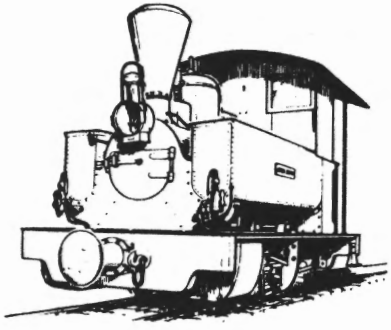
An iron-railed tramline was laid from the storage shed (situated on the foreshore at the base of the kilns) along with full length of the jetty to the end, where the rails forked into two sidings. A couple of four-wheel trollies powered by horse were used on the jetty. The gauge of the tram is not known, but it appears to have been around 3 ft 6 ins.

The Company employed 70 men at the peak of operations, and a lively settlement grew up around the kilns. Overland communication was maintained via the Fish Creek railway station, 16 miles to the north, by means of coach that made the trip three times a week.

The enterprise continued working until 1926, when economics turned against it, and lime-burning shut down. The settlement shrunk almost to nothing for the next twenty years, but has revived since then to cater for the leisure activities of a more affluent society.

References:

Feature article in "Walkabout", August 1959
Victorian Government Gazette 1875 pp 222-224, 1876 pp 292, 298, 798; 1878 pp 65, 221.
Various Municipal Directories 1890 to 1930.



LETTERS

SOUTH AUSTRALIAN JETTY TRAMWAY

Further to my letter in LR69 please note the following addition and correction:

1. To the list of other jetties which had tramways add Robe.
2. Relating to Kitson T.97/1884 the information that this locomotive was formerly used at Kingston is incorrect. The item should read 'Ex Dalgety & Co., Beachport and originally new to SAMB, Port Germein Jetty'. (Note on builder's number: this is the locomotive referred to on page 7 of LR64).

Richard Horne
Croydon, Surrey, UK.

THE HARTLEY VALE SHALE TRAMWAY, NSW

Reading the interesting article by F. John Reid (LR64) I am curious that in his list of references the author made no mention of the book 'The Shale Railways of New South Wales' by Gifford Eardley and E. M. Stephens, published in 1974 by the Australian Railway Historical Society (NSW Division).

According to such records as I have the Company's tramway was of 1.00m gauge (not 3ft) and appears to have possessed certainly two and possibly three locomotives. Of these one (Dubs 1442 or 1880) was a 2-4-0T type and worked on the *Hill Top* line connecting the Hartley Vale siding on the NSWGR Western line with the top of the incline along the Darling Causeway.

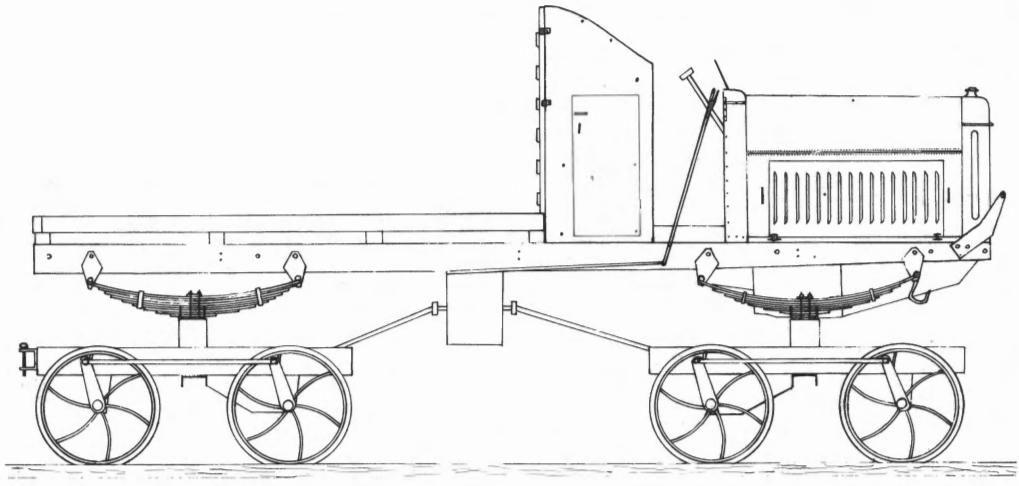
There are conflicting opinions (and evidence) as to the identity of the two locomotives said to have been employed on the *Flat*, i.e. in the valley, linking the foot of the incline with the works. These were variously described as a Fowler of approximately 1886 vintage and alleged to have been a 2-4-0ST. The second engine is something of a mystery, though a photograph of it appears in *'The Shale Railways of NSW'*, which claims it was built by Mort's Dock, in Sydney, date unspecified. Although the locomotive was said to have been built as a 0-4-0ST, the photograph depicts it as a curiously foreshortened 2-4-0ST with outside Stephenson valve gear, and an open cab.

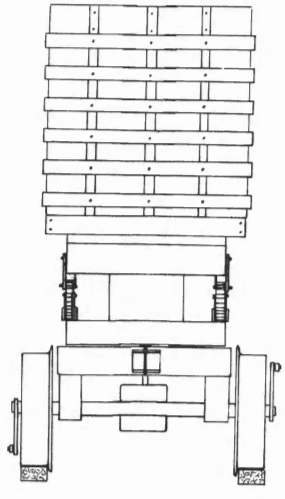
What became of any, or all of these after the works closed down for good in 1913 is anybody's guess, but Eardley recounted a visit to the area about 1950 when the Hill Top Dubs was still more or less intact (lacking only its distinctive builder's plates). Down in the valley the party encountered a pair of side tanks bearing unmistakeable evidence of once having carried Dubs plates. Given the lack of any evidence of other than the Mort's Dock engine on the lower level tramway, the existence of the alleged Fowler may be questionable, as there were precious few metre gauge Fowlers known to have come to Australia.

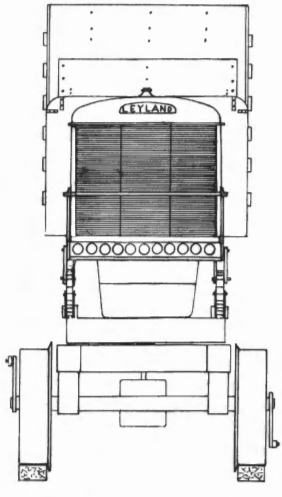
In view of the impending world 'energy crisis' it is interesting to speculate on whether the wheel has turned full circle, with such early enterprises as the Hartley Vale and Wolgan Valley shale oil industries getting a new lease of life!

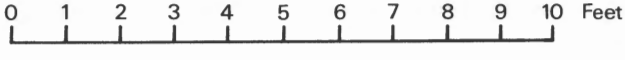
With regard to the photos of Federal Timber Co at Warburton, Victoria on page 35 of LR64, the extension beyond Warburton station on VR was named La La Siding (not Lal Lal - an entirely different location on the Geelong-Ballarat line) where there were exchange sidings between the 3 ft 0 in gauge privately-owned timber tramways and the VR which had its two-stall engine shed and turntable in the same area.

John Buckland
East Brighton, Victoria









CHRISTENSENS 4TH TRACTOR

Converted from an ex-army Leyland truck in 1940 by W Christensen at the Delatite Sawmill, Mirrimbah.

Sold in about 1946 to Clarke and Pearce at Alexandra (Vic).

M J McCARTHY 7/80