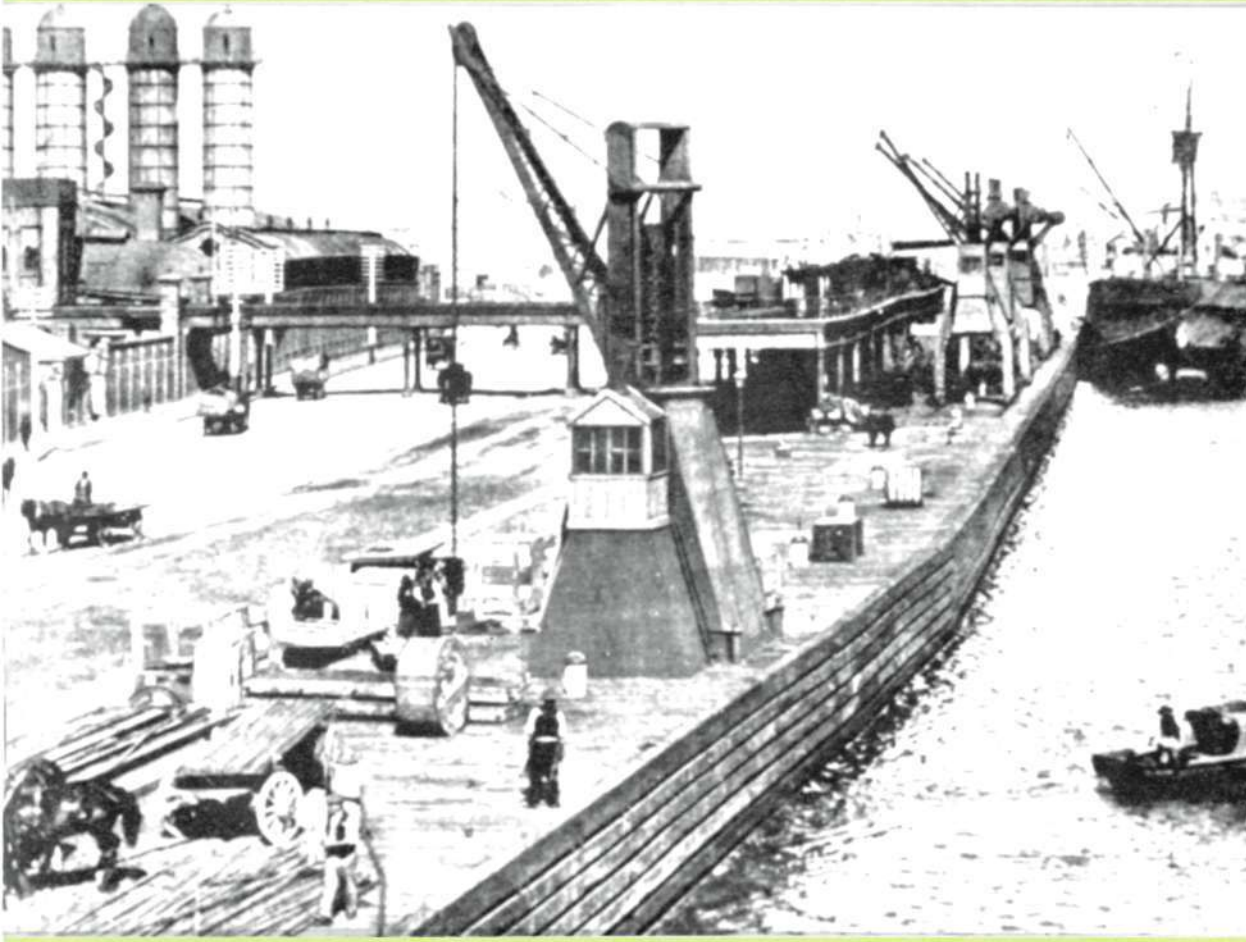
LIGHT RAILWAYS

Number 90 October 1985

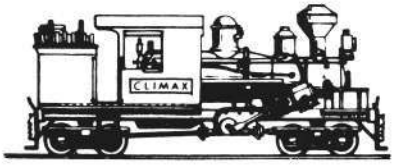
Industrial Archaeology Issue

ISSN 0 727 8101



Published by
The Light Railway Research Society of Australia

Registered by Australia Post - publication No. VBQ1339



No. 90
Vol. XXIII
OCTOBER 1985

ISSN 0 727 8101

Light Railway Research Society of Australia

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Back numbers *Light Railways* and other publications from LRRSA Sales, P.O. Box 32, Mornington, Vic. 3931.

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CONTENTS

Light Railways is the journal of the Light Railway Research Society of Australia. The Society's members are undertaking research into the history of light railways in Australia and her territories. These include railways and tramways serving the timber industry, sugar mills and mines, construction tramways, industrial railways and narrow gauge passenger-carrying railways.

Articles, letters, book reviews, maps, photographs and drawings on topics of relevance to *Light Railways* are required for future issues. Comments on previous articles offering corrections or additional information are welcome for inclusion in our "Letters" columns. Written material should be typed with double spacing. Material should be sent direct to the editor.

Cover: This 1890 view of the West Melbourne gasworks and No. 9 berth, North Wharf on the Yarra River sets the theme for this issue. The photo shows the elevated viaduct carrying the railway from the wharf to the plant and the rail mounted cranes which transferred coal to the Company's wagons.
Photo: Port of Melbourne Authority

EDITORIAL

EDITORIAL - INDUSTRIAL ARCHAEOLOGY IN AUSTRALIA

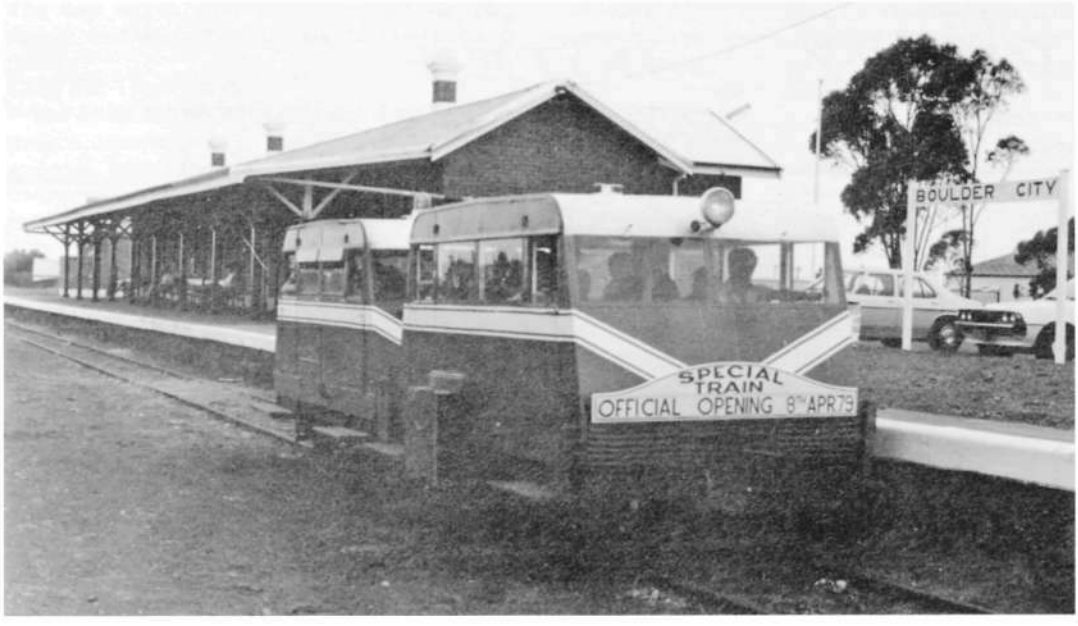
This issue of *Light Railways* is devoted to the theme of industrial archaeology and features articles on the West Melbourne Gasworks tramways, Cumberland gold mine in Queensland and Selkirk Brickworks at Ballarat. The Light Railway Research Society of Australia has been active in promoting this theme and *Light Railways* has published many articles over the years which have contributed to industrial archaeology literature.

Interest in industrial archaeology in Australia has increased in recent years, mainly through the efforts of Judy Brimingham, Ian Jack and Dennis Jeans of the University of Sydney. Their latest book, *Industrial archaeology in Australia: Rural industry* (Heinemann, 1983) sets out to promote industrial archaeology as an established field of study in Australia for both scholars and amateur historians. It follows the author's earlier *Australian Pioneer Technology* (1979) and describes and analyses the physical remains of frontier industries which provisioned and allowed communication between isolated settlers and settlements - flour mills, brick-making and other clay-using industries, the building industry, and transport and communications. In so doing, the authors not only describe the particular industries, but also the underlying changes in the economy and settlement patterns in the nineteenth century.

The introductory chapter, "Approaches to industrial archaeology in Australia", sets out four definable approaches to the field:

- the 'things' or technical approach of the engineer, concerned primarily with professional factors and standards;
- the 'landscape or occupance' approach of the geographer, for whom the countryside may already be an 'open-air museum';
- the 'political and institutional' approach of the conventional historian concerned with the causes and effects of implementing ideas in government; and
- the 'man-the-toolmaker' approach of the archaeologist, concerned with adaptation and with the social and technological contexts of industrial activities.

A researcher can bring any of these viewpoints to



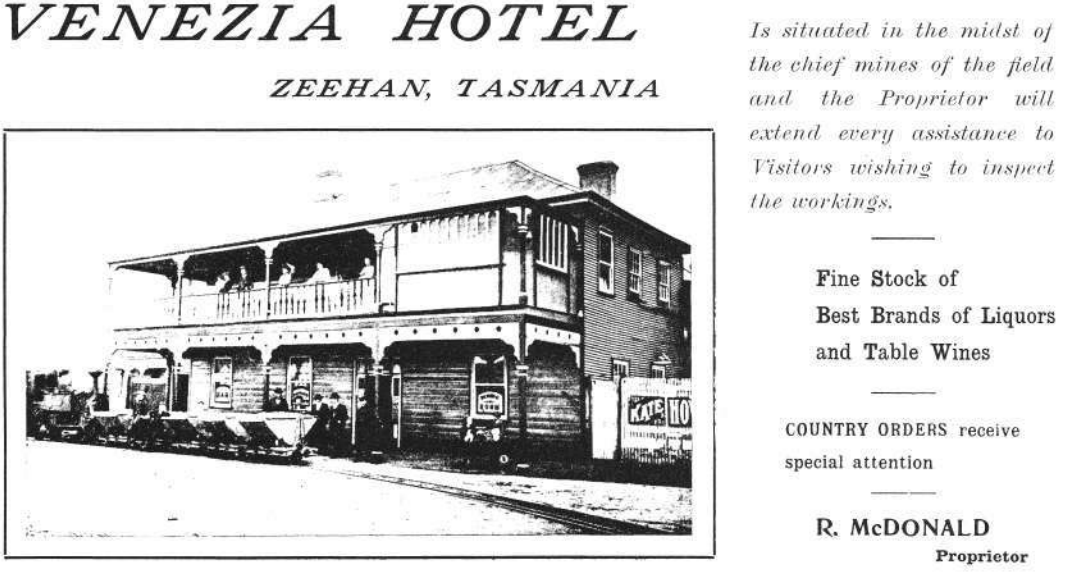
A notable centre for Australian mining history is the famous "Golden Mile" in Western Australia. The Golden Mile Railway Society operates tourist trains over the 7 km 1067 mm gauge Kalgoorlie-Boulder loop line which feature commentary on mining operations along the line. Here the official opening train sets out for Golden Gate on 14 April, 1979. Photo: David Whiteford

industrial archaeology studies. The authors emphasise that the major concern should be the physical nature and existence of both industrial items and their surroundings. They offer practical suggestions on investigation methods and a separate chapter by Ian Jack, "Sources for industrial archaeology in Australia" is an invaluable reference for anyone wishing to investigate a light railway in an industrial setting.

An important theme of the book is that mere description is not enough: interpretive activity is a fundamental part of industrial archaeology. Analytic description and scale drawing, the placing of an industrial complex in a context of housing, recreation and transport, and the identification of the technology employed with comparable materials from the time, are required to give the general public, scholars and heritage bodies the sort of information they require. Birmingham, Jack and Jeans suggest a number of interpretative themes for industrial archaeology in Australia:

a) Environmental Rigour: focusing on the constraints imposed by the new, different and often harsh conditions of the Australian environment.
b) Cultural Isolation: although Australia had the opportunity to draw on the full resources of the Industrial Revolution, the response of industrialists was often influenced by isolation: the migrant's yearn to return home, the heavy hand of distant governments and boards of directors, the challenge to innovate and the costs of shipping.
c) Colonial Enterprise: the opportunities for energetic and resourceful individuals to establish new enterprises.
d) Pioneering Frontier: the influence of a moving zone of experimentation, adaptation and new environmental challenges.
e) Transplanted Technology: the issue of imported verses adapted technology.
f) City and Country: the process of dispersal of industries to inland towns and then concentration of larger plants in the major coastal cities.

These themes offer a guide to the light railway historian interested in interpreting the history of a line and the industry it served. The material in this issue of *Light Railways* provides an illustration of the range of industries, outside our traditional focus on timber, on offer to the researcher interested in a railway theme. Norm Houghton's article on Selkirk brickworks shows that tramways have and continue to play an important role through various phases of an industry's development. In this case colonial enterprise established the industry in an inland centre and continued adaptation of technology has enabled the enterprise to remain viable in the face of



Old advertisements can provide a useful source of railway history. This 1908 example shows one of the Zeehan street tramway lines running past the Venezia Hotel with a typical train of the day. Which line is it?
From *Pictorial Guide to the West Coast of Tasmania*

city competition. The Cumberland Mine and West Melbourne gasworks have long sucumbed to the pressures of technological change. The former's history offers an example of the moving frontier and colonial enterprise and the relics of this endeavour provided a valuable guide to the field researcher. The West Melbourne gasworks operations brought images of a transplanted technology from industrial Europe: today a new wave of pioneers have preserved the key symbols of that technology in order that future generations might have a better appreciation of our heritage.

Industrial Archaeology in Australia: Rural Industry. By Judy Birmingham, Ian Jack and Dennis Jeans, Heinemann Australia, 1983, 191 pp.

THE SELKIRK BRICK WORKS TRAMWAY, BALLARAT

by Norm Houghton

The large brickmaking enterprise currently carried on by Selkirk Brick Pty. Limited at Ballarat has used tramways of one form or another since 1900 for handling raw materials and semi-processed and fired bricks. The Company has progressed from narrow-gauge man-powered systems to broad-gauge automated tramways over this period.

Robert Selkirk shifted operations to the Company's present Howitt Street site from Allendale in 1900. This move led to a more efficient handling of raw materials and transport of wares. The new works were built alongside the clay supply, and abutted the Ballarat to Maryborough railway.

Clay Pit Tramways

The initial extraction of clay and shale from the surface deposits was by means of barrows and waggons, but as the hole deepened an iron-railed tramway system was installed. In the hole itself a gang of laborers mined the clay seams by drilling adits in various directions. The raw material was loosened by explosives and shovelled into tramway trucks. These iron trucks were made by the Selkirk blacksmith, and were of one tonne capacity to hold a cubic metre of clay. The trucks themselves weighed 500 kg.

The laborers pushed the loaded trucks over a 762mm gauge tramline laid with 23kg rail to a central point, where they were attached to a cable and winched along the floor of the pit and then straight up the side of the pit over an incline 200 metres in length that terminated above the grinding pan in the works. Here the contents of the trucks were jumped through bottom-opening doors, and the empties lowered back down into the pit. The rails on the incline were 36kg profile on account of the heavy loads hauled over it, and were obtained second-hand from the Victorian Railways, surplus from relaying of the Serviceton line.

The purchase of additional brick-making machines around 1928 led to the need to increase raw material output from the pit and permit greater quantities to be delivered to the grinding pan. James Selkirk, proprietor of the works since 1921, then laid a second line of inclined rails to the pit floor. The cable-winding gear had to be altered to cope with the new arrangement, so James first made a working model from his son's "Meccano" set to test his ideas before installing the modified gear. This equipment remained in use for the next 25 years.

Mechanisation on the pit floor came about in the mid 1930s when excavating machinery was installed. Selkirks purchased a Ruston Bucyrus half-cubic metre capacity steam shovel second-hand from the Eildon Weir Construction project. This cumbersome machine was mounted on rails, and was capable of moving itself forward at a fast speed of 800 metres an hour and a slow speed of 400 metres an hour. When the shovel was delivered by road truck to Ballarat a way had to be found to place it into the pit, as no access road was available. The solution adopted was to dismantle the machine into manageable sections and lower the pieces by a cable that was stretched across the entire width of the pit and secured to traction engines at each end.

Works Tramways

The hauling of the raw material within the works and the movement of the semi-processed bricks to the kilns was at a comparable level to the methods employed in the pit, and remained unchanged from 1900 to 1946.

Clay and shale from the pit was taken into the works where it was crushed, put through a pan mill, elevated to a loft, conveyed along the loft and wiped

off into stockpiles. Machinery handled these tasks. The stockpiles were situated above each brick-making machine, and here was stationed a labourer with a shovel, whose task was to feed the clay-mix down a chute to the machine below. The machine mixed, milled and added water to the clay, and then pressed out the brick shapes onto a revolving table and, finally, added the "frog", i.e. the indentation and maker's name on one face.

At this point manual labour resumed. The green or unfired bricks were taken off the machine by hand and stacked 56 at a time onto small 4-wheel tramway trolleys. This tramway system was built with 6kg rails laid to a gauge of 457mm, and ran from the brick machine room to the kilns. This tramway delivered the green bricks to the entrance wickets of the Hoffman kilns and was operated by man-power. Flat iron sheets laid in the wickets enabled the trucks to be slid around to place them in position for the setters to unload the bricks for firing.

The Anderson brick-making machines used at Selkirks' produced 2,000 bricks an hour; the Bradley & Craven's half that number, and this output meant that the man taking off, the tramway trucker and the two setters to each trolley had to handle 1,000 bricks an hour each. The green bricks weighed 4.5kg each, so that in a full eight-hour shift these men individually handled 36 tonnes of brick solely by muscle power.

After the bricks were fired they were taken out of the kiln on iron-wheeled barrows to stockpiles or to waiting road wagons and rail trucks.

The Broad Gauge Siding

Soon after setting up in Ballarat, Robert Selkirk had begun to develop markets outside the immediate district, and by 1903 needed access to the Victorian Railways' network for long-distance haulage. Selkirks' property happened to have a railway running along its Western boundary, so it was with minimal trouble and expense that Robert was able to have a private railway siding installed. The siding opened on the 9th July, 1903, and comprised 120 metres of track capable of holding ten railway trucks. At that time the siding was beyond the Ballarat railway yard limits, but it was worked by Ballarat shunting engines, acting under special instructions. Each work day at around noon the siding was cleared of loaded trucks, and any empties or trucks of coal and firewood shunted in.

By the 1920s some two-thirds of Selkirks' production was marketed outside Ballarat, and all of this went by rail. The drawers wheeled the barrow-loads of bricks straight from the kiln into the rail trucks. The standard 16-tonne rail truck held 4,400 bricks, and these were stacked four or five rows high. Cream, pink or special bricks were inter-layered with straw or shavings to prevent chipping in transit.

Such was the strength of Selkirks' markets by 1925 that the firm was the largest user of rail trucks in Ballarat and despatched in excess of 15,000 tonnes or 4,125,000 bricks annually.

The railway siding was used for the receival of coal and firewood. Between 1910 and 1938 the plant was powered by suction gas engines, the gas being generated from burning wood, and each year around 600 tonnes of 1.5 metre-length wood was consumed. The kilns were fired by coal - some 2,500 tonnes a year.

Elevated Tramway

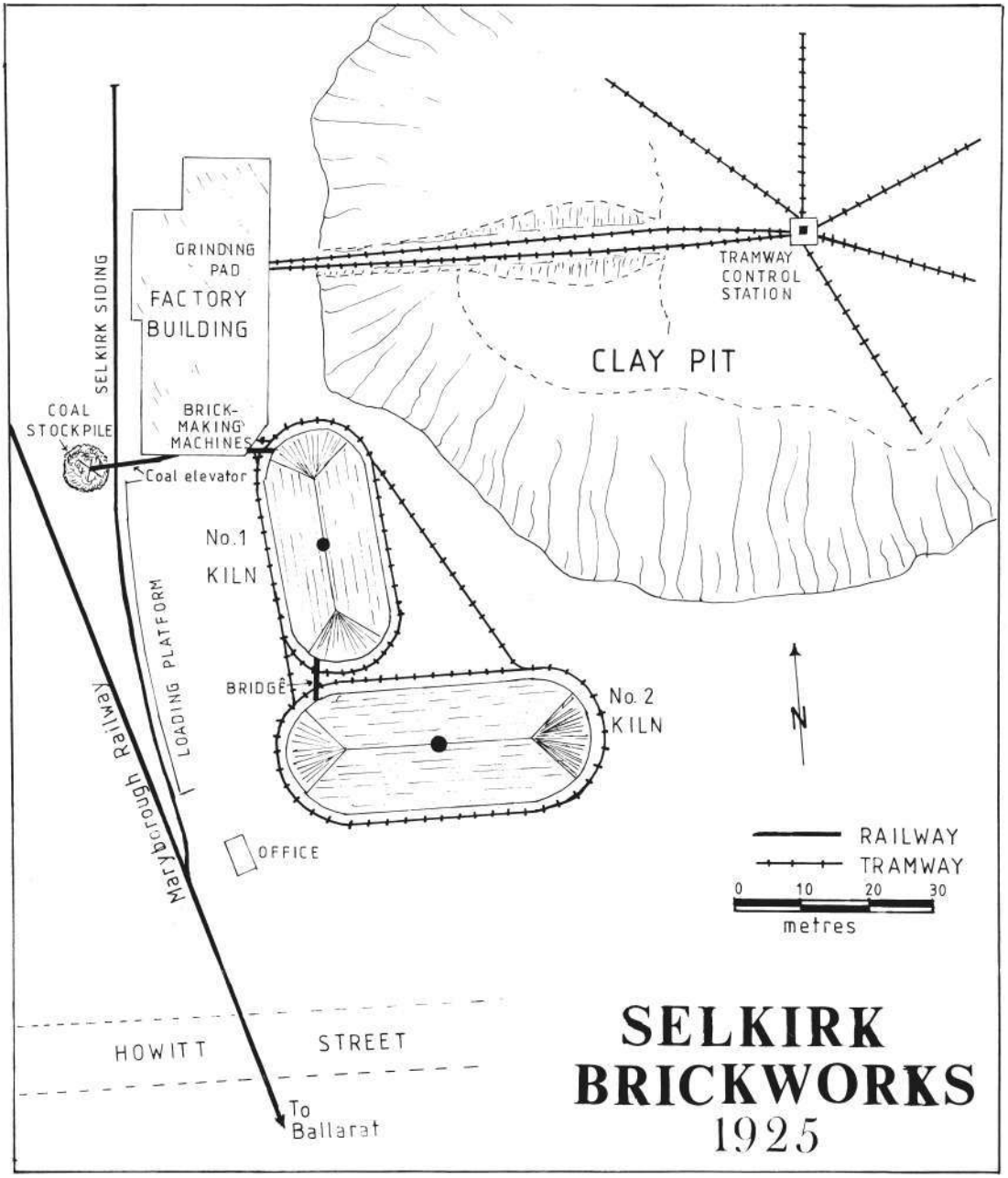
The coal was distributed to the kilns by an elevated tramway system. The inwards coal was shovelled from the railway trucks into a pit below rail level, where it was loaded into a small skip. A cable was then attached to the skip to haul it up an incline to the level of the loft, from where it was pushed across the bridge into the top of the No. 1 kiln, and from there across another bridge into the No. 2 kiln. A circular track around the top of the kilns enabled the skip to be taken near the firing pots. The coal was then shovelled into a small wheelbarrow by the furnaceman, and thus taken to the firing pots where the final delivery into the fire below was made by a small hand scoop.

Post-War Modernisation

All of the transport and handling methods described above survived until 1945, when changes were introduced. Bill Selkirk returned from his war service in 1945, eager to modernise and improve the brick works. By 1947 the labour-intensive methods used in the clay pit could no longer be economically justified. The steam shovel was retired, and three Ballarat-made Angow shovels sent down the pit. These vehicles were based on ex-Army Blitz truck chassis and were able to excavate the raw materials from any point and deliver to the central point.

Within two years the pit was extended to the North, and this put the former centrally-located tramway control station out of convenient reach for the shovels, so a conveyor system was installed. The conveyor was laid from the working face across the floor of the pit for 200 metres to the pit's Western wall, where the raw material was fed into

Right: Aerial view of Selkirk brickworks in 1925.



two bins from where the tramway trucks on the incline were automatically loaded. Bill Selkirk devised an automatic tripping mechanism so that as the truck ran under the bins the delivery chute opened and dropped a measured amount of clay into the truck. This system improved clay winning to the extent that sufficient material for the work's daily requirements could be obtained in four hours.

Nevertheless, problems persisted. The raw material as delivered to the conveyor was excessively lumpy, and men had to be detailed to break these lumps with hammers. This difficulty was overcome by installing a crusher at the pit end. The crusher was designed and made by Bill Selkirk, with engineering advice from the Ballarat School of Mines. The crusher was fabricated on the surface above the pit, and in order to deliver it an International DC6 Bulldozer was acquired, a road carved to the pit floor, and the crusher hauled down. A Ruston Bucyrus Diesel excavator of half a cubic metre capacity was also purchased around this time. The working method then adopted was for the bulldozer to extract the raw material and deliver it to the excavator, where it was mixed on the ground and placed into the crusher for conveying to the tramway loading bins. The final refinement came in 1951 when the conveyor was extended up the side of the pit to the surface, and the tramway was scrapped. These improvements enabled the work force of fifteen men at the pit in 1945 to be reduced to four by 1951.

The handling of semi-processed bricks was the next part of the works to be modernised. Increased production meant that greater quantities of green bricks had to be handled, so the hand-drawn tramway trolleys were replaced. Two Lister Industrial trucks were obtained and fitted with ten brick-carrying trailers made from war surplus material - e.g., the rubber wheels were from bren gun carrier track suspension systems. The tram lines were concreted over to provide a path for the Lister trucks. The Listers pulled the green bricks from the machines to the kilns, dropping off a trailer at each wicket for the setters.

A Return to Rail

By the mid-1950s the Company decided on a long-term modernisation plan, and beginning from 1958 scrapped the entire works in three stages and replaced it with the most up-to-date plant available. This process involved the adoption of two tramway systems in the new tunnel dryer, tunnel kiln and associated packaging system.

The dryer, as its name states, aims to reduce the moisture content in the unfired bricks before firing takes place. The dryer is a brick and reinforced concrete structure 52 metres long by 18 metres wide, consisting of two tunnels each with fan sections. The tunnels are fitted with ten rail tracks of one metre gauge, and over these pass the 162 dryer cars loaded with green bricks resting on timber pallets or battens. The process is continuous and controlled without intervention by the plant operator. As the wet clay column comes out of the extruder on a conveyor, it is cut into individual bricks and palletised. A conveyor carries the palletised bricks to an elevator that places them in a gathering frame. When the gathering frame is filled it deposits its load of 960 bricks in two lots onto a dryer car that is then moved by a chain to the mouth of the dryer.

A transfer car or traverser, travelling at right-angles to the propelling chain, takes the dryer car into the dryer and places it in one of the ten tunnels pre-selected by programme drums. Each car-load of bricks remains inside the dryer for 48 hours and passes through the 15 sections, each with its own radiator and fan. The bricks are first subjected to high humidity, which gradually decreases as temperature increases. After this process of controlled drying the car-load of bricks is ready for the kiln.

A transfer car at the exit end of the dryer pushes the dryer car outside into a storage rail track that runs the full length of the dryer building. A propelling chain takes over, placing the car exactly in position opposite an unloading machine.

The bricks are "combed off" the pallets by a belt conveyor, and the pallets returned by another conveyor to the automatic palletising machine. Between 1961 to 1962, before the third stage was completed, bricks then passed to setters who stacked them in a special pattern ready for fork-lift trucks to take them to the old kiln to be fired. This was the first time the bricks were manually handled. By then they were "dry", and man-handling could not affect their consistent shape, texture or size. Since completion of the third stage in 1962 the bricks move to the setters via a belt conveyor that crosses over and behind the deck of the empty kiln tramway cars and are picked off by hand and stacked in the firing pattern in front of the conveyor.

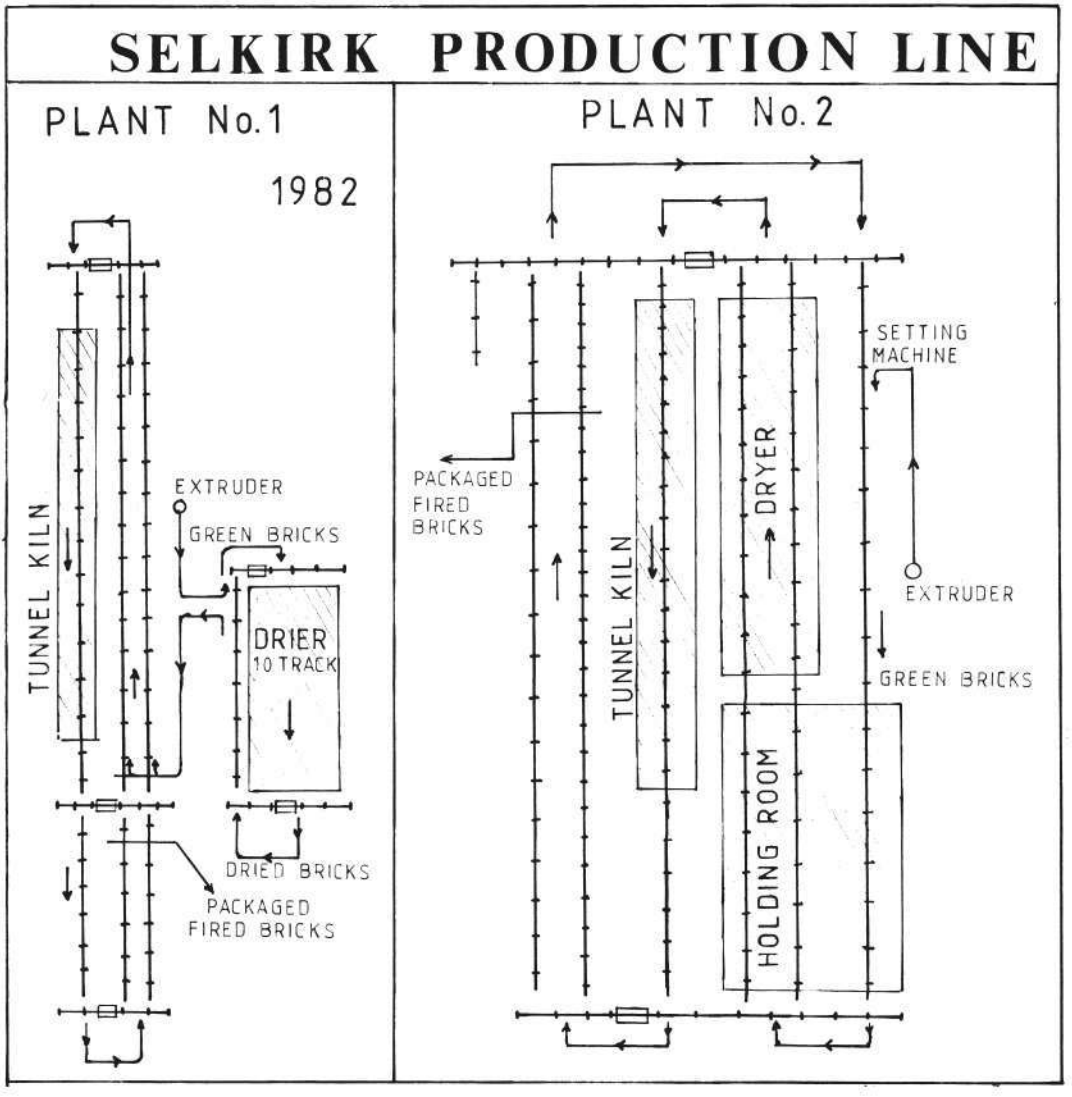
The third and final stage of the redevelopment was the provision of a tunnel kiln to replace the oval Hoffman kilns. The tunnel kiln has stationary firing points, and the bricks move past these on cars or trolleys, unlike the Hoffman where the bricks are stationary and the fire is moved around the oval. Selkirk's tunnel kiln in this section is 107 metres in length by 10 metres wide, and construction of a brick casing, steel members, concrete and insulating material.

The bricks are conveyed through the kiln on 40 cars having a loading deck 3.2 metres by 2.33 metres and loaded with around 3,000 bricks to a height of 1.75 metres. The cars run on rails set to a gauge of 2.49 metres, and are driven by means of an

hydraulic undercar propeller or cable haulage. The cars proceed North from the loading point between the dryer on one side and the kiln on the other to the end of the kiln, where a transfer car or traverser shunts one car sideways and forward into the kiln. The kiln can accommodate 117,000 bricks at the one time, and the firing cycle from cold entry to cold exit is around 40 hours. The fired bricks emerge from the South end and are moved sideways by another transfer car to the rails of the packaging section, where the car is unloaded and the empty car pushed forward to the loading conveyor to begin the cycle again. The total length of the tramway is 360 metres. The capacity of the kiln as built was for 60,000 bricks per 24-hour day, or 20,000,000 per year.

Construction was finalised in July, 1962. The kiln was then ready for commissioning along with matching-up the extrusion, clay storage and handling, clay preparation, clay extrusion, drying and packaging systems to form the integrated production line that became known as Plant No. 1.

By 1971-72 this plant had reached maximum output, and since the brick market was rising



Bricks set on kiln cars awaiting drying and firing at Selkirk brick plant No. 2 in 1982.

Selkirks decided to investigate the feasibility of expanding output by provision of another production line embodying the latest technology. The vision of the Company was bold enough, because the plans provided for more than a doubling of existing output to 50,000,000 bricks per year.

The proposed plant was to include all the techniques and practices evolved by the Company in handling Ballarat clays, and was to comprise clay storage and handling, clay preparation, extrusion machinery, an automatic setting machine to place the green bricks onto kiln cars, dryer, gas-fired tunnel kiln, packaging installation, maintenance workshop and yard storage.

The new plant was constructed on the North end of the No. 1 building, and work began in 1973. The production line is similar to the other plant - the raw material is delivered into the proportioning feeders and then through the wet pan mill, high-speed, fine-rolling mill, screen feeder, extruder and wire cutter. The column of cut bricks is then placed in the appropriate firing setting on the kiln cars by an Automatic Setting Machine. This machine gathers the bricks, forms them into rows and then uses compressed-air bags attached to a rotating head to grip the green bricks and set them down onto the car. The cars then pass to the holding room before moving through the dryer and into the kiln for firing.

Eighty eight kiln cars were furnished for this plant. These cars run on 20kg rail to a gauge of 2.49 metres and are 5.03 metres in length by 4.52 metres wide. The original design capacity for the cars was 5,760 standard bricks. These cars are moved along their tracks either by an under-car hydraulic pushing system or cable haulage at a speed of up to 2 metres per minute, and are switched to the different tracks by two transfer cars, one at each end of the plant.

The dryer is 122 metres long by 9.24 metres wide, contains two tracks to hold 24 cars plus a holding room for a further 33 cars. Nine zones divide the dryer to permit a proper sequence of drying with waste heat from the kiln.

The kiln is a Bickley "Iso-Jet" tunnel kiln from Bickley Furnaces Pty. Ltd., some 98 metres in length by 6.18 metres wide, and capable of containing 18 kiln cars. It is constructed of a red brick casing with structural steel roof supporting members and lined with fire brick in the appropriate sections.

The specified output of the kiln is 27,500,000 bricks per year. The firing cycle is 35 hours from cold entry to cold exit. Once the fired bricks emerge from the kiln they are shunted to the adjacent unloading area, and packaged. The empty cars then pass under the packaging jig and are transferred back to the setting machine for the cycle to begin again. Plant No. 2 was commissioned in 1975.

Extrusion, setting and packaging take place during the Monday to Friday day shift, but drying and firing occurs continuously over 24 hours, seven days a week. The cars are moved through the various stages automatically and without intervention by the plant operator. Sufficient bricks are extruded and set into kiln cars by Friday afternoon to carry the firing process over the weekend.

The application of computer technology to old fashioned railed transport has enabled the company to remain in the forefront of the clay brick industry.

Sources

Information for this article was generously supplied by Selkirk Brick Pty Limited and in particular Bill Selkirk, Robert Selkirk, Ian McCoy, Bonny Reynolds and John Griffith.

THE WEST MELBOURNE GASWORKS TRAMWAY

by John L. Buckland

Metropolitan Gas Company Ltd

this now long-defunct company was established to supply town's gas for domestic and industrial use to the greater part of Melbourne's city and inner suburban area, as well as provision of street lighting. It established its principal gas-making plant adjacent to the north bank of the river Yarra, at West Melbourne, between the river and nearby Victoria Dock. Subsequently another plant was established at South Melbourne, but both were phased out of use by establishment of the Gas and Fuel Corporation of Victoria - a State-owned instrumentality charged with responsibility for the reticulation and marketing of natural gas derived from the offshore discoveries made by the Esso-BHP consortium in Bass Strait, off the Gippsland coast in the 1950's.

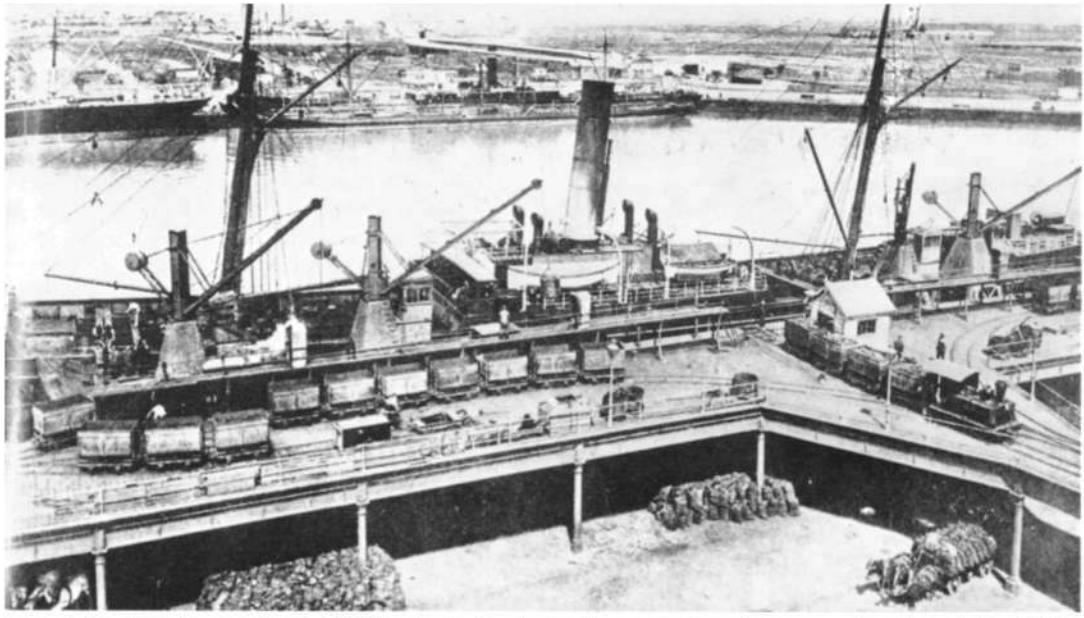
The Metropolitan Gas Company produced town's gas from coal from the Maitland area mines in the Hunter Valley of New South Wales, which was shipped by sea from the Port of Newcastle to Melbourne. The coal was unloaded from colliers adjacent to the West Melbourne plant at an elevated wharf parallel with the river bank by four hydraulic cranes. The tee-shaped wharf had a central elevated bridge or trestleway spanning North Wharf Road and continuing into the works.

762mm Tramway

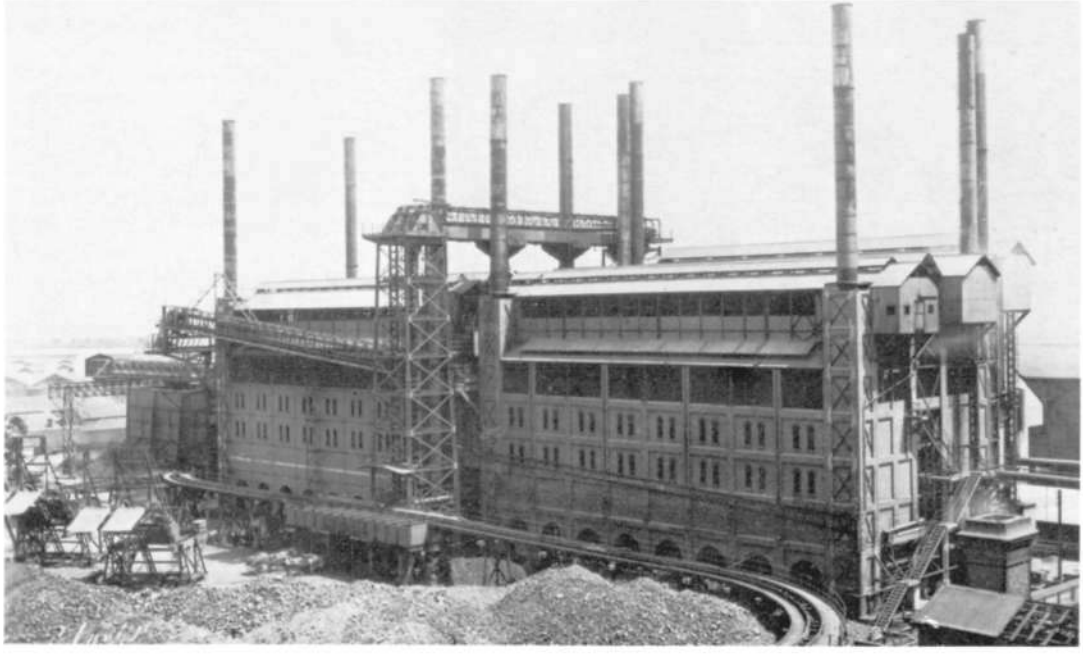
To haul coal from the wharf to the works a 2ft 6in (762mm) gauge tramway was constructed in the 1880s. The original track arrangement appears to have been a double track from the wharf, spanning North Wharf Road on the trestleway and within the plant compound continuing as two single tracks, with a scissors crossover between the two at their point of divergence. The east line continued straight ahead, while the west line curved away north-westwards towards the retort house. This track arrangement was illustrated in the 1916 Decauville catalogue and is believed to have represented the layout circa 1890.

One interesting feature of the West Melbourne line was the provision originally, probably by Decauville, of very French-looking dual directional mechanical signals, or point indicators applying to both east and west main lines and working in conjunction with the switches of a scissors crossover at the divergence of the two mainline tracks. These took the form of four double-armed metal vane pivoted signal arms with balancing spectacle plates on both sides of the lattice steel masts, which were in effect route indicators. Your author can just remember seeing these as a schoolboy.

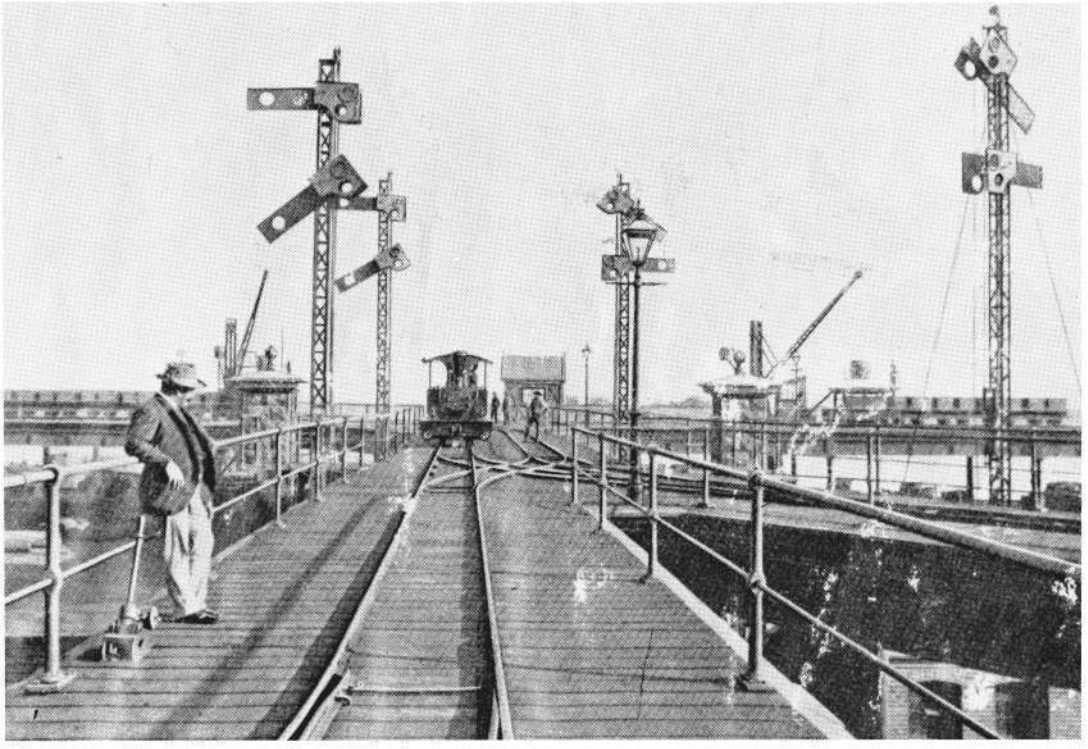
Coal arriving by ship was originally loaded manually into baskets in the ship's holds, lifted by one of the four hydraulic cranes mounted on the edge of the wharf and tipped into rakes of four-wheeled two-ton capacity tubs or wagons for haulage by steam locomotives to the works - a distance of perhaps 500 yards (450 metres). To work this line, over which a quite intensive shuttle



General view of pierhead of wharf installation showing four hydraulic cranes, rakes of wagons and track layout, circa 1912-1920.
Photo: JL Buckland collection



A 1928 view of the retort house of the West Melbourne gas plant showing inner loop of the railway serving hoppers for vertical bucket elevator carrying coal to the top of retorts. The double tracks of the 'east' and 'west' main lines can be seen at the bottom right.
Photo: courtesy Gas & Fuel Corporation



View looking towards wharf showing track layout of 1890 with route indicator signals applying in both directions.
Photo: courtesy CS Small

service must have been worked during ship unloading, the company imported two new 6/7½ ton industrial type 0-4-0T locomotives from Decauville et Cie., Paris in 1886 and 1890 - their suppliers' builder's Nos. 43 of 1886 and 90 of 1890, which were named *John Benn* (the company's chairman) and *Carbon*, respectively.

Both locomotives were in fact identical products of the Belgian industrial locomotive building firm Societe Anonyme des Usines Metallurgiquesdu Hainault, Couillet, and carried their builder's identifications No. 861 of 1886 and No. 986 of 1890. The coal tubs or wagons, of which there were 50, are believed to have been locally built to the requirements of the company. When filled, they were originally moved along the wharf to a central turntable, turned through 90 deg. and winched into rakes of six, ready for haulage into the works by one or other of the locomotives.

500mm Gauge Tramway

The Decauville catalogue of 1894 provides an illustration of a 500mm gauge tramway at the West Melbourne works. The tramway consists of 1100 metres of portable track of 4.5kg/metre rail on which ran 51 4-wheel side-tipping wagons. These were propelled by hand to charge the retorts with coal hauled from the wharf over the 762mm gauge line.

The illustration shows what appears to be the interior of the retort house, with men pushing wagons on a double track which fed a hopper to the 'a scenseur', which in turn delivered coal to an elevated section of 500mm gauge tramway which was the means whereby the retorts were charged.

Alterations to the Tramway

Extensive alterations were made to the 762mm tramway layout over the years, probably commencing prior to or during the First World War. The track layout shown in the map represents the situation obtaining, following major modification of the plant carried out in the 1930's in preparation for installation of a conveyor belt system fed by the first of two electric level-luffing wharf cranes, operating on rails on the wharf immediately west of the original elevated structure, which was eventually dismantled.

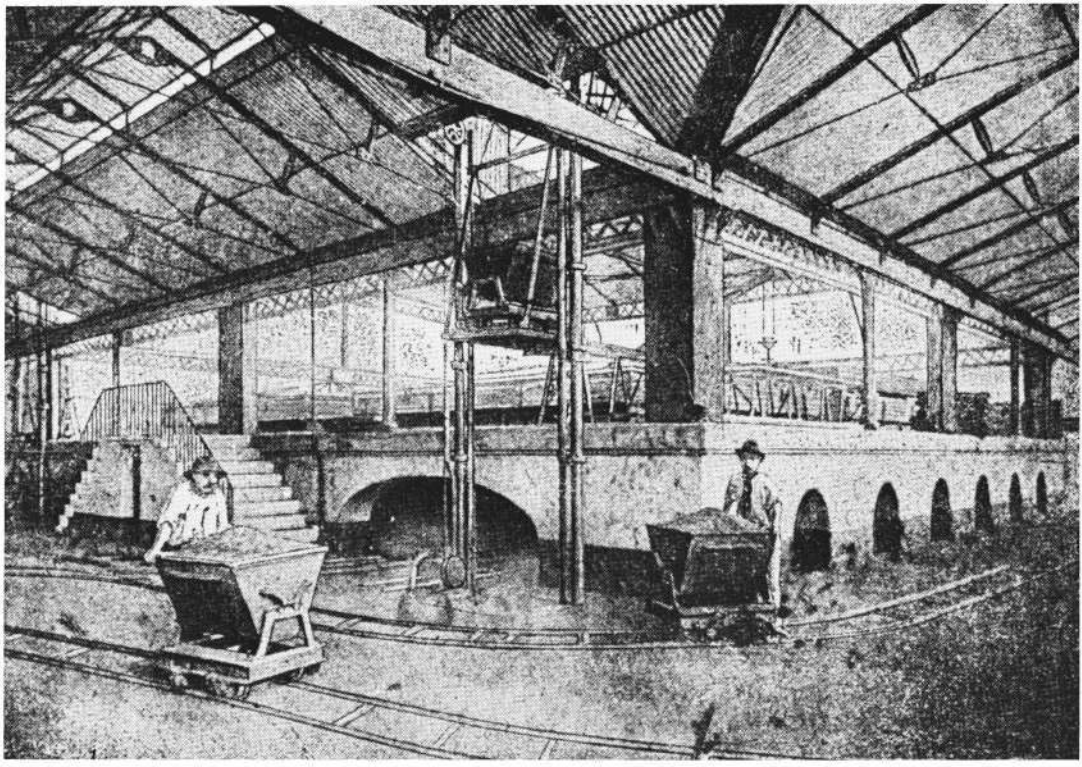
In a subsequent modification of the track layout on the pierhead, the turntable appears to have been eliminated by tracks curving in both directions off the eastern 'main' line and westwards off the western line, both of which continued as a double track almost to the far side of the works originally, although the western track was subsequently removed in 1930, with its connecting tracks.

After entering the company's compound, a single track branch diverged off each line; that to the east leading into a long covered storage area and that off the west line curving past the retort house and continuing beyond to enter the coal storage yard behind it. A second single line off the west line before the retort house served hoppers feeding the bucket elevator conveyor delivering coal to the top of the retorts. This line joined the coal storage loop line at the side of the retort house. Both these single tracks and the west main line were removed in or about 1930, prior to the installation of a conveyor belt system for use with new electric level-luffing cranes on the wharf. This installation came into use in 1933.

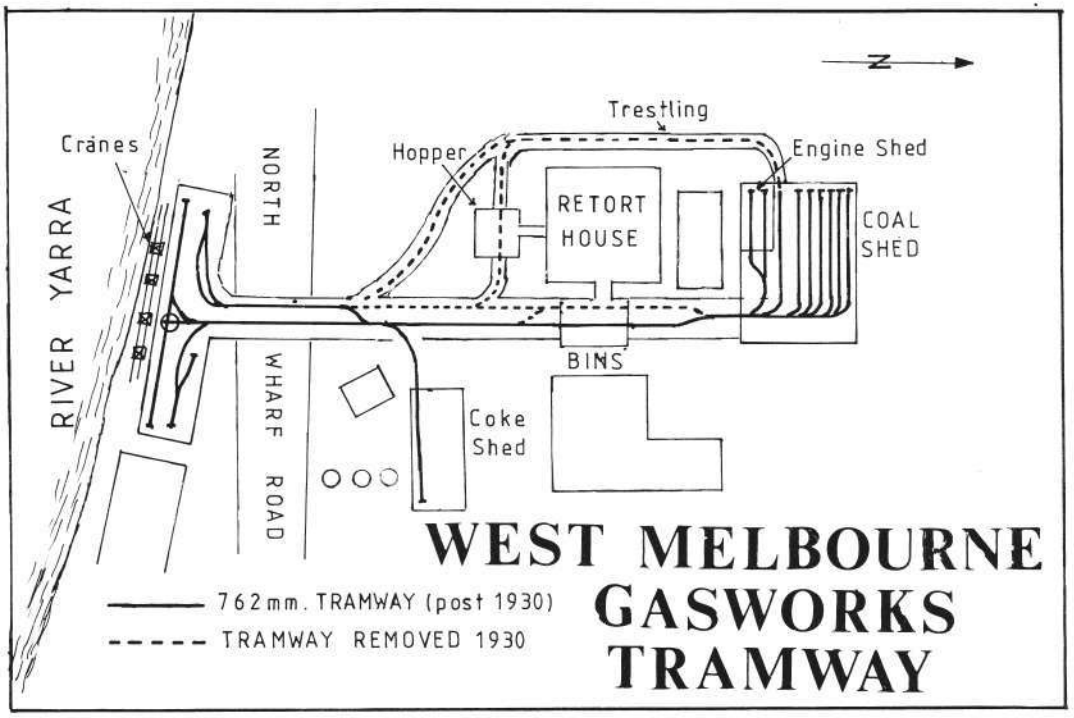
Originally the double track 'main' lines continued north over under-track hoppers on the eastern side of the retort house and after becoming single, curved to link up with the coal storage loop, as well as serving six deadend tracks, where the wagons were stored when not in use. A lead off the coal storage loop gave access to a two-road section enclosed as an engine shed in the south-west corner of the coal storage area sidings which were all roofed over.

South Melbourne Works

In connection with the establishment in the 1920's of a new gas-making plant at South Melbourne, linked to the old Town Pier on the Hobson's Bay shore at Port Melbourne by a double-tracked surface line running along the street frontages, the company purchased a third locomotive in 1926. This too, was a 0-4-0 wheel arrangement but of saddle tank configuration supplied by Peckett & Sons, Bristol, England (builder's No. 1711 of 1926 of that firm's *Jurassic* class). This engine was named after the Metropolitan Gas Company's then chairman *Sir John Grice*.



1890 Decauville catalogue illustration of 500 mm gauge tramway at West Melbourne Gasworks.



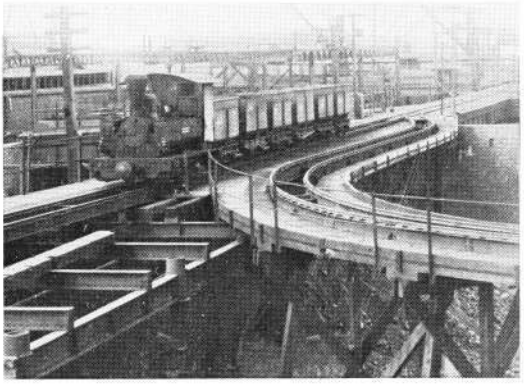
The Company was however, refused permission by the Port Melbourne City Council to operate on its streets, so after only one test trip, the newcomer was transferred to West Melbourne, leaving horses to haul the coal to the South Melbourne plant, until displaced by motor transport.

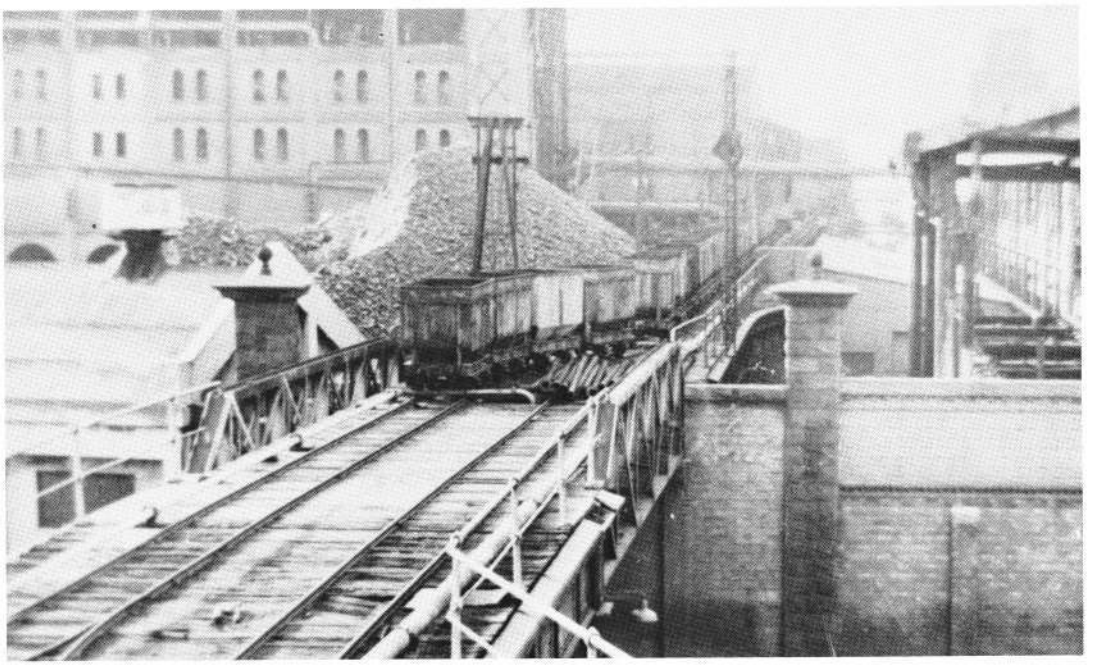
Operations 1933-46

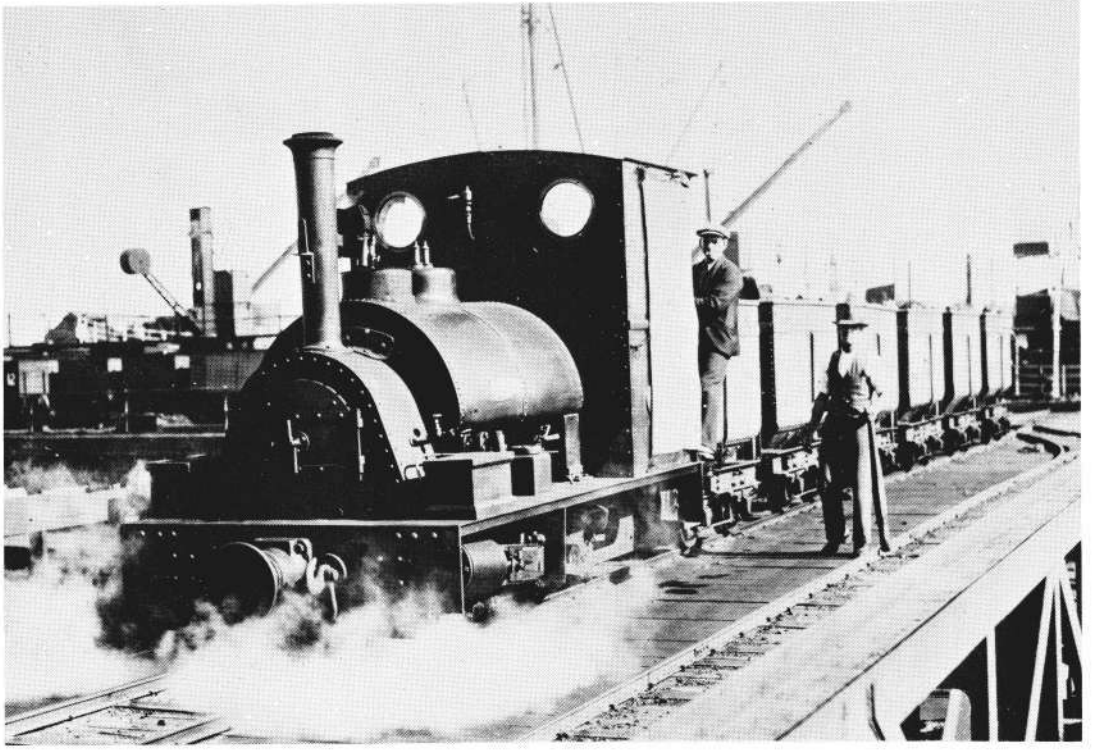
Following the commissioning of electric wharf cranes and the conveyor belt installation in 1933, the two Couillet locomotives supplied by Decauville were set aside, while the Peckett was retained on standby for use when necessary to supplement the conveyor system by hauling coal from the storage area to the retort house hopper. So *Sir John Grice* was invariably brought back into service each winter until 1941, when the conveyor system was able to meet the demand and the Peckett joined its brethren in retirement in the loco shed, protected by tallow, but otherwise uncovered.

The three engines were painted dark green, unlined, with all brass and copper pipes and fittings highly polished and with brass nameplates mounted on their water tanks. The coal tubs were painted dark grey with black underframes, which had a 'dumb' central buffer with side coupling chains.

Opposite top: Couillet locomotive No. 861 of 1886 and named *John Benn* for the company's chairman. The photo was taken in 1910.
Right: View of the "main line" at the point where the double track ended. Both JL Buckland collection.
Below: Post-1930 view showing one of the Couillet locomotives on the single track main line. Photo: LG Poole







Metro Gas Company's third locomotive was this 0-4-0ST by Peckett & Sons, Bristol (B/No. 1711 of 1926) named for the then company chairman *Sir John Grice*. It is shown here with a six wagon rake on the 'east' line adjacent to the pierhead, circa 1928. Note the change to central buffer with adjacent drawhook. Photo: AR Lyell, JL Buckland collection

In 1946 the company offered the locomotives free of charge to anyone who would remove them, but there were no takers until in 1962 a Mr George Russell, of The Basin, an outer eastern suburb of Melbourne, dismantled *John Benn* and *Sir John Grice* and removed them to his property. At or about the same time *Carbon* was taken by a Mr W Ferris to Walhalla in Gippsland where it ran for a time on a circular track in the former Victorian Railways narrow gauge yard area, hauling tourists in an adapted VR wagon for a few years.

Locomotive Preservation

In further developments, the history of two of the locomotives looked up following the purchase by Mr Jack Griffiths, the proprietor and the *Whistle Stop* amusement park, off Skye Road, in Frankston's hinterland in 1966 of the Peckett from The Basin and *Carbon* from Walhalla and their transfer to Frankston for restoration. The third engine, *John Benn*, was purchased by Messrs Ron Kain and Don Marshall on behalf of the Walhalla and Thomson River Steam Tramway, which they planned to run over a portion of the closed and abandoned former VR Walhalla line north of the Thomson River. Their engine was removed to Tecoma in the Dandenong Ranges, where over a period of years it was extensively modified and rebuilt as a 2-4-2 saddle tank of American outline, with a large wooden cab, ornate dome and a spark arrestor atop the stack. It was later transferred to Walhalla where it ran occasionally on a length of track within the confines of the former station yard, hauling a seated NQ open wagon. But this operation appeared doomed and operation has now ceased, with the loco and wagon removed, apparently for use in another location, in 1977.

Meanwhile, the beautifully restored *Decauville No. 90* (originally *Carbon*) went into service on a circular track around an artificial lake in bushland at the *Whistle Stop* in 1968. However, due to an horrendous increase in municipal rates imposed by the Frankston City Council, Mr Griffiths was

forced to cease operations in 1974, leaving the dismantled and partially restored Peckett and *Carbon* in the engine shed on the property. An auction of the equipment held on 16 October 1974 resulted in the sale of the Peckett to the Puffing Billy Preservation Society, where it was re-assembled as an exhibit at their Menzies Creek Museum site in November, 1974.

The operational Couillet B/No. 986 (invariably wrongly described as a Decauville) was withdrawn from sale as it failed to attract a bid to match the reserve price. So far as is known, this now historic and most beautifully restored locomotive is still in storage at Red Hill on the Mornington Peninsula. It is reputed to be the oldest locomotive of its type still serviceable anywhere in the world, and possibly the oldest still extant of its kind!

To complete this narrative, it remains to record that a team of Puffing Billy Society members undertook the restoration to service of Peckett B/No. 1711 and their labours were rewarded when it was steamed for the first time on the Emerald Tourist Railway, on which it can successfully haul one carriage on the 1 in 30 ruling grade. So this completes the trio of locomotives of the former Metropolitan Gas Company's fleet - all of which have been restored to working order, if not actually working, which must constitute a unique record!

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Acknowledgements

I am indebted to Charles S. Small for the Decauville catalogue illustrations, and to Ray Ellis for the 1930 track diagram. Other illustrations are reproduced courtesy of the Gas and Fuel Corporation of Victoria.

Fully restored and in steam at Whistle Stop Amusement Park, Frankston, Victoria in the mid-1970's, Coulliet 986/1886 is believed to be the only one of its kind still in working order and certainly one of the oldest Coulliet locomotives still in existence. Photo: Doug Colquhourn

Faithfully restored to working order and steamed on special occasions by the Puffing Billy Preservation Society's Museum, Peckett 1711/1926, resplendent in green paint with polished brass, was photographed at Lakeside on its inaugural run in December 1981 by Lindsay Crew. It hauls one ex-VR carriage.

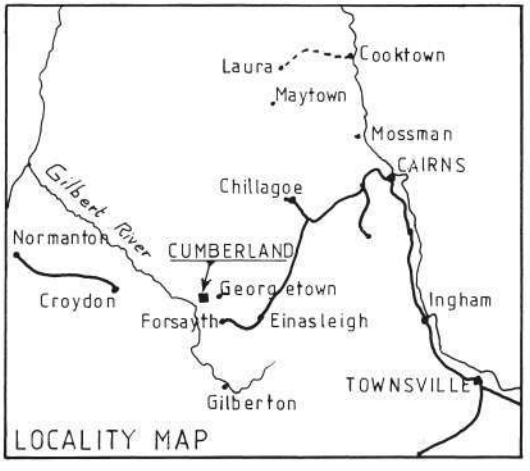
THE CUMBERLAND MINE AND ITS TRAMWAY

by JD and RS Kerr

Introduction

More than ninety years ago a horse drawn tramway was built half a mile to connect the richest and deepest mine on the Etheridge goldfield in North Queensland with its 30 head ore-crushing battery. By the tramway's completion there was little payable ore remaining in the Cumberland mine and over £100,000 of English investors' money had been lost. Most of the cash lined the pockets of the mine's former owners and the rest was used to build an expensive battery that was never needed and to sink the shaft down to barren ground.

When Queensland became a separate colony in 1859, European settlement scarcely existed in the Tropical North and the mining industry was non-



existent except for coal mining in the West Moreton. Gold had been found in small quantities but the Canoona debacle of 1858 soured the image of the north and especially of Rockhampton, for many years. The discovery of plentiful gold at Gympie in 1867 gave the frail colonial economy its first solid base on which to fund the massive capital borrowing program required for a rail network. Squatters and land grabbers had pushed the frontier of settlement northward but now miners and prospectors joined the race as gold was found at Cape River in 1865 and in fabulous quantities at Ravenswood in 1868, Charters Towers in 1871 and the Palmer in 1873.

Etheridge Gold Field

Springboard for the rich Palmer alluvial discovery had been the huge Etheridge gold field discovered by the geologist Richard Daintree. He used the pastoral industry as a financial base for his exploration, discovering the Einasleigh copperfield in 1866 and gold when exploring the Gilbert River country the following year.[1] The rush began following the publication of Daintree's report in early 1869, despite warnings that the alluvial deposits were patchy. Three thousand men were on the field by July, most having tramped in from the east coast port of Cardwell. Hampered by lack of machinery and shortages of supplies, the disappointed left and the adventurers spread out in search of more rewarding deposits. The Gold Commissioner's office established at Gilberton was moved 100 km north west to the mining camp at Western Creek which sprang up following the discovery of gold there in May 1870. When the Overland Telegraph reef was found near the Etheridge River, the township of Etheridge was established, renamed Georgetown by the Mines Department in honour of the gold Commissioner, Howard St. George. Georgetown rapidly became the capital of the Etheridge attracting a population of 600 by the end of 1871 as the first crushing machine on the field was erected. Five were at work 12 months later and more followed[2]. Returns were erratic, batteries depending for water on the annual wet season early in the year which resulted in impassable roads, bogged teams and soaring prices for the necessities of life. When the creeks stopped running and the waterholes were exhausted, the batteries fell silent

The Cumberland Gold Mining Company's cyanide works in 1897. Photo: *Queenslander*, 22 May 1897

and pay dirt and quartz had to be stacked and miners waited in hope.

Cumberland Mine

New discoveries were commonplace but one not to be forgotten was at Cumberland, 20 km west of Georgetown, T Parks, WJ Smith, John Hardie and William Steele registered the Cumberland Prospecting Claim, 460 by 400 feet (140 by 122 metres), on 18 December 1872. News of the discovery travelled fast, Cumberland South and Cumberland No. 1 North having been registered nine days earlier. Steele had located their reward claim well, for while they profited, the adjoining registered claims were abandoned within a year, to be tried again and again by the hopeful.[3]

A mine is a wasting asset; as its resources are exploited, its residual value declines until it is exhausted. However, a mine will not sell for its true value until it has yielded well - few people will pay highly for an untried asset. William Steele bought WJ Smith's share in Cumberland after the 1874 crushing. When 160 tons of ore yielded a rich 556 ounces of gold in the first two months of 1875 despite losing 180 ounces of gold and amalgam in the floods, Cumberland gained its reputation as one of the best finds in the field. T Park sold his quarter share to Edward Hunt at a satisfactory price but he probably had regrets when future returns showed how much gold remained.[4]

The gold bearing ore had to be carted long distances to the Gilbert River where the Riverstone battery was occupied for most of its time on Cumberland stone. Cartage costs cut heavily into profits but it was August 1877 before the partners, Steele, Hardie and Hunt were able to secure their own machine, the Nil Desperandum battery near the present day railway terminus of Forsayth. They bought it for £630 cash but apparently left the machine there although it would have been a greater asset at Cumberland; maybe they were diversifying, afraid the Cumberland riches might cut out at any time. Cumberland was the bright spot on the Etheridge whose gold returns had crashed from 13202 ounces in 1876 to 3842 the following year as many of the best miners flocked to the Hodgkinson rush.[5]

The decline was temporary and yields picked up in 1878, 1860 ounces or a quarter of the Etheridge yield coming from only 697 tons of Cumberland stone. Patrick O'Brien became a partner on 18 May 1878 when he bought an eighth share which John Murphy had just bought from Hardie. Murphy again became a partner when he bought an eighth from Hunt on 6 January 1879. O'Brien quickly became the driving force of the enterprise and in time the chief shareholder. A battery was ordered but there was little profit in 1879 as 800 tons of stone were stacked awaiting commissioning of the battery.[6]

The new £3000 machine was shipped from Sydney in August 1879 but it was the following February before it was erected and began work. The battery was well equipped with berdans, Wheeler and Wilson's pans to improve recovery but after only a few days' action, the meagre water supply was exhausted. The 800 tons of ore remained at grass and from February until December 1880, there was no crushing from the richest mine in the district.[7]

O'Brien & Company

Having learnt the hard way, the partners, William Steele, Edward Hunt, Patrick O'Brien and John Murphy, operating as O'Brien & Co, began work on an expensive dam on Cumberland Creek. At the same time they converted their Prospecting Claim into a seven acre (three hectare) lease. The usual wet season filled the dam and with constant work in 1881, the battery crushed 2790 tons of stone for a yield of 7031 ounces of gold. The last 500 tons yielded over four ounces to the ton and the shaft, down 220 feet (67 metres) at the end of the year was the deepest on the Etheridge with a reef 13 feet wide increasing in richness as it went deeper. Cumberland was largely responsible for the yield of the whole field jumping from 8821 ounces in 1880 to 20926 in 1881[8].

With high profits providing excellent prospects, the partners surrendered their original lease No. 18 and obtained a 21 year lease No. 34 over 12 acres of gold bearing ground, and sank £1500 into a substantial dam. Several properties were taken up surrounding "O'Brien's celebrated lease" and the camp formed into a township with hotel and store and a population of 25 Europeans and a dozen Chinese.[9]

O'Brien & Co erected another five head of stamps in 1883 superintended by H. Gillies and continued to raise valuable ore from an underly shaft which, sunk at an angle of 52 degrees to a depth of 300 feet, was equipped with a tramway and worked by Robey's steam winding gear. A specially designed wagon was used on the tramway to allow for the incline. One seen at the site in 1977 had the flange reversed on the lower wheels and was totally enclosed except for the upper end which was designed to be horizontal despite the angle of the shaft, to provide maximum capacity. Two hundred

Wagon used on the inclined shaft tramway, photographed at Cumberland in June 1977. Photo: the authors

yards (180 metres) away, a second shaft reached nearly 100 feet deep. Fifty men and boys were employed as the year's production reached 9000 ounces from 3000 tons of stone. In 1884 output rose to 11373 ounces despite the dam being exhausted at the end of August due to drought and the effect of the increased rate of crushing.[10]

Surveyor Sircom laid out a township between the leases and the dam and more permanent residences began to supplement the four hotels. By June 1884, 100 men were employed and production reached 500 ounces of gold per week. When the water ran out production stopped and drinking water had to be carted two miles from the Springs, a well fitted up by the Divisional Board, forerunner of the present Etheridge Shire Council.[11]

The Cumberland Block Gold Mining Company operating No. 1 South Cumberland and Cumberland No. 1 North Gold Mining Company both erected ten stampers each of nine hundredweight matching those of the Cumberland Company, but O'Brien & Co continued to dominate the big returns, unchallenged as the best mine on the Etheridge. Their second shaft was down to 250 feet by the end of 1885 and it too was equipped with steam winding gear and tramway.[12]

Cumberland Gold Mining Company Ltd

When Archie Forsyth visited the mine in 1886 it seemed opportune to float the mine on the English market; masses of London money had already disappeared into far less worthy prospects on the Etheridge, Charters Towers and Mount Morgan field and elsewhere in Australia. O'Brien & Co responded quickly, writing to Robert Philp on 6 March and requesting Burns, Philp & Co, the successful North Queensland merchants to organize the float and inviting Philp and James Burns to take shares. An agreement formally dated 8 October 1886 was entered into by O'Brien, Hunt and Steele with McIlwraith, McEacharn & Co, London, for the floating of the Cumberland Gold Mining Company Limited with a capital of £185,000 in one pound shares. The vendors received £100,000 in cash and 60,000 fully paid one pound shares in the company in return for handing over the mine, its machinery and its 12 acre gold bearing lease, two well equipped winding shafts, a 10 head battery complete with two Brown and Stanfield's patent

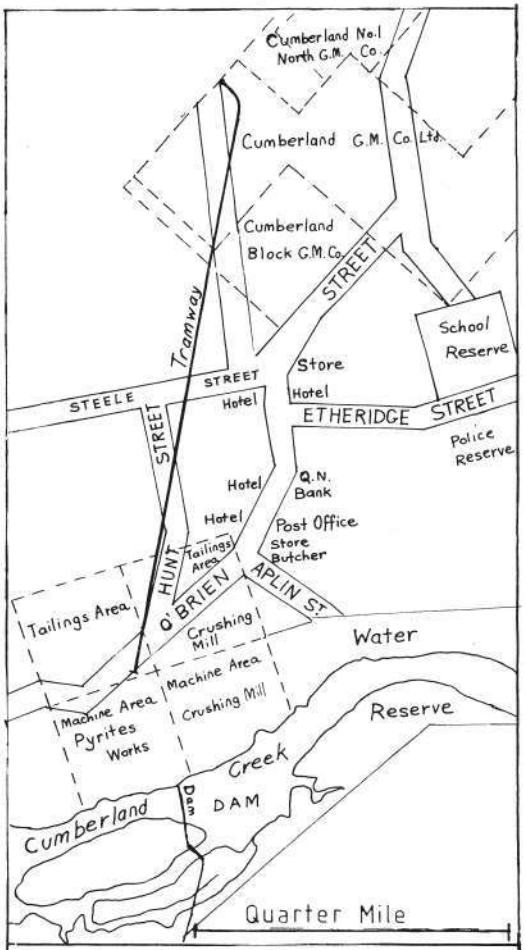
concentrators, ribble table, eight Wheeler's grinding pans, three Wheeler's concentrators, two Berdan pans, two Halley's patent percussion tables, a gold smelting furnace able to treat 3000 ounces per day and 12,000 tons of tailings. The company was incorporated in London on 7 October 1886, the subscribers to its memorandum and articles all being London businessmen, headed by Edmund Alfred Pontifex who became Chairman of Directors, Andrew McIlwraith, Bernard Gibson, John Macfarlan, Malcolm Donald McEacharn, Robert Gambles and Francis Waller Bates.[13]

The company dealt with the Queensland Bank which established a branch at Cumberland. During 1887, 6595 tons of quartz yielded 17,125 ounces of gold and with the supply of gold apparently limitless, the company declared a dividend of two shillings and sixpence per share (12.5% on capital) and sank its working capital into expensive machinery imported from England tripling the battery capacity. At the end of 1888, the company had thirty head of stamps, four tramways, above and below ground, totalling 1500 yards or 1.4 kilometres. Cumberland's population in 1888 reached 379: 224 miners, the usual tradesmen, 48 women and 76 children. The mine's performance did not match the heavy capital expenditure and big payroll. The battery stopped in November 1887 for lack of water and production in 1888 fell to 5487 ounces from 2320 tons.[14]

In 1889 the huge plant crushed only from May to September: the water supply was splendid but there was no ore! Yield was a mere 1639 ounces from 2216 tons of stone, the poorest ore since the mine opened. The huge workforce had raised less than 8 tons of payable material per working day. The remain solvent, the company was forced to issue preference shares, the usual strategy of an unsuccessful venture to induce its shareholders to part with more cash rather than see their holdings rendered worthless as ordinary shares.[15]

The London directorate had not been totally remiss in their failure to prospect the mine for ore. O'Brien & Co had, at the company's request, retained management of the property until March 1888. From London, directors issued instructions to sink further in search of reserves, but little happened until Arthur Neild was appointed the company's representative in Queensland and arrived at the mine on 31 October 1888. The failure was not revealed to shareholders until the general meeting of the company in London in October 1890 when the directors admitted that "the reason that these very intelligent working miners did not continue to sink the shaft was that almost immediately beneath our feet the character of the rock altered".[16]

Using the capital raised by the preference share issue, the company sank 242 feet through barren ground, while the hopes of its shareholders sank with the feeling they too had been the victims of another colonial trick. Most of the workers were retrenched, the Cumberland population at the end of 1890 numbering only 169, fifty of them carters and timber getters and only 30 classed as miners. The battery ran for six months, four on stone and two retreating tailings yielding 3668 ounces of gold from 2512 tons. Sinking and driving continued



Cumberland Mine Tramway
Drawn from 1889 map in school file (ED U/Z706, QSA) and 1918 map Cumberland Township (QSA)

The abandoned shafts at Cumberland viewed from the mullock heap in June 1977. The small object in front of the shaft at centre is a wagon especially built for the inclined shaft tramway. Photo: the authors

during 1891 and although some rich veins were cut, the halfyearly General Meeting was told in May 1891 that expectations had not been fulfilled. Administration costs were cut and salaried staff at the mine drew only £1299 per annum.[17]

Tramway Construction

Financial stringency finally resulted in the cost of cartage being tackled. A nine hundred yard (800 metre) tramway was belatedly constructed from the mine to the battery. Cutting, embankment and bridgework ensured a steady downgrade for the loaded trucks and it was just on the point of completion in May 1891 as the company ran out of funds and was forced into reconstruction. Had some of the needless expenditure on extravagant machinery been used to build the tramway four years earlier, the company would have been better able to make a profit on lower grade ore.[18]

Renewed Efforts

The new Cumberland Gold Mining Company (Limited) continued sinking and in July 1892 reported four ounces stone at the 900 feet level. By the end of the year the shaft had reached 1006 feet (307 metres) and although little stone was raised, Mining Warden AC Haldane retained his firm conviction that the Cumberland PC would again become the premier mine on the field. Only 1101 ounces of gold were recovered and the best hope of profits lay in retreating tailings by the new McArthur-Forrest cyanide process. Construction of the necessary vats began in late 1893 but before the equipment had been completed, a torrential downpour in January 1894 breached the dam and washed away an estimated 10,000 tons of tailings. Given the poor extraction of gold from the complex ores of the Etheridge by conventional crushing and amalgamation, the tailings were expected to yield up to one ounce of gold per ton. The dam had held enough water for two years and the bywash proved inadequate. Attempts to hastily cut a second by-wash failed and the rushing water forced a 120 feet hole in the dam wall. The tramway lay idle in 1894 as the battery lacked water for operations and Cumberland ore was carted east to the Durham just west of Georgetown whose own mine had proved an expensive failure to investors. The Cumberland

cyanide works were commissioned but were able to treat only 944 tons of tailings recovering 963 ounces of bullion before the water supply was exhausted.[19]

Cessation of Operation

The dam was repaired and with a renewed water supply, 4000 ounces of gold bullion were recovered in 1895 from 5,000 tons of tailings left after the washaway. Cyaniding was completed next year, producing another 2028 ounces valued at 43 shillings per ounce, or just over 50 per cent pure gold. The cyaniding works, the remaining 15 head of stamps, and the one thousand feet shaft, deepest on the field, all remained when the Cumberland Gold Mining Company abandoned its property in 1897. The absence of a working crushing mill then forced many independent miners to other fields although a party of four men took up the ground in 1898. John Williamson took over operation of what became known as the Lady Norah cyanide works in 1898 and began a long association with the field, sinking on the Jubilee reef.[20] The rails of the tramway were probably lifted for use underground. The road linking the railheads of Forsayth and Croydon via Georgetown, continued to pass through where the township of Cumberland via Georgetown, continued to pass through where the township of Cumberland had been. By the 1960s the dam and the chimney were the only landmarks and when a new beef road was constructed, a straighter course was adopted cutting across the tramway formation. Many tourists pass by now and wonder at the chimney but few realise they have crossed the site of a tramway, built too late for the mine it was meant to serve.

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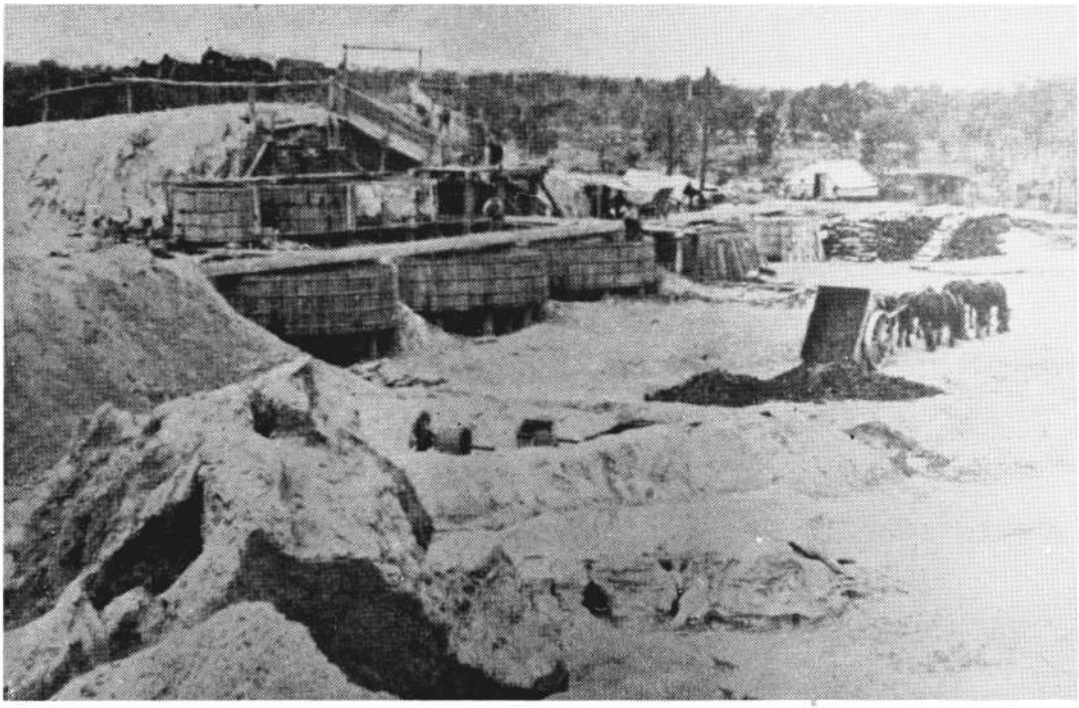
Looking south along the tramway formation from the bitumen road to the chimney, the only remaining structure of the Cumberland Gold Mining Company's works. The township was on the flat closer to the camera. Photo: the authors



The Lady Norah cyanide plant, Cumberland, 1904. *Queenslander*, 24 September 1904

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LIGHT RAILWAY RESEARCH SOCIETY OF AUSTRALIA
25th Anniversary Celebrations, 1986

The LRRSA will be holding special celebrations in Melbourne over Easter 1986 to mark the 25th Anniversary of the Society. The program is expected to cover:

- a new book **Timber Mountain** by Norm Houghton;
- a publication, **Rocky Bluff to Denmark,** featuring the best articles from early issues of **Light Railways;**
- a bush walk along early tramway sites;
- visits to operating light railways; and
- a special anniversary night.

Further details will be provided in future mail outs, but plan now for Melbourne at Easter 1986!

FROM THE ARCHIVES
LIGHT RAILWAYS

(*Adelaide Observer*, May 22, 1897)

Lieutenant-Colonel Stanley, the Engineer-in-Chief of Queensland, returned to Australia by the mail steamer Victoria on Monday from a trip to America and Europe, undertaken at the request of the Queensland Government, to inquire into the construction and management of light systems of railway lines. A representative of the *Observer* met the colonel on board the steamer on Monday.

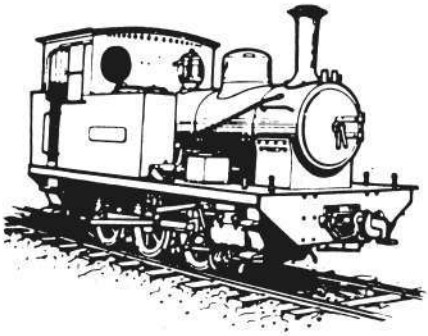
"I left Queensland in the beginning of August last," said Colonel Stanley, "on a mission for the Queensland Government, and crossed from Sydney to Vancouver. I travelled across the American Continent by the Canadian-Pacific route, and journeyed through the principal cities of the United States, including St. Louis and Chicago. My special business was to collect information on railway matters generally, more especially with the view of seeing as much as possible of the cheap and light railway lines. I found, as a matter of fact, no narrow-gauge lines in America, with the exception f one isolated instance. I visited all the principal engineering works of interest, where the large locomotives for the American lines are built, and altogether spent a most instructive stay. Leaving America in December, I went to England, and the rest of my time was occupied in travelling about Great Britain and the Continent. In connection with light railways, the best examples I observed were those of Belgium. There an admirable system of light lines has been adopted, many of them being constructed along the roads, and others through private lands where the roads are not available. They are mostly of the 3ft 3in gauge, and though extremely light their utility is beyond question. The lines were constructed chiefly for the benefit of the farming districts, and run from Brussels into the country, carrying milk, butter, cheese and other produce directly into the market places of the city. They have as a rule no connection with the main lines.

"I also visited Ireland, but found the narrow-gauge lines of 3ft 6in constructed in all essential particulars in the same way as the main lines. In France, however, I was very much interested in the DeCauville system, situated at Corbeill, near Paris. The line runs right through farming districts, and exists chiefly for the purpose of bringing the beet sugar to the factories; but in addition is utilised for passenger traffic. We have this class of line on some of our plantations in Queensland. The gauge is 2ft 6in, gradient 1 in 45, the locomotives each weigh 20 tons, and take 60 tons upon a 45 grade at a speed of 23 kilos, or about 12 miles an hour. The lines in France are not fenced, but are well ballasted, and, what is of greater interest, they are not expensive.

"On my way across the Continent I visited Vienna for the purpose of inspecting the Abt system of rackrail and adhesion combined. The Eisberg line, which runs between Vordenberg and Eisenerz, is twelve miles in length, and is constructed on the ordinary standard gauge. It was built for the carriage of iron ore to the smelting works at Eisenerz. All the gradients on the rack incline are 7 per cent, that is 1 in 13, and 150 tons can be hauled up that incline at once. I travelled over the line on the engine, and was very much impressed with what I saw. The ease with which the engine ascended the steep gradient was amazing. In descending the engine is reversed, and its speed checked with an air-brake. I was specially interested in this type of line because the Queensland Government are constructing one to Mount Morgan. We have there a very heavy range to cross that would render the construction of an ordinary line prohibitive, and it was at my suggestion that it was decided to adopt the Abt system. The line will be one and a quarter miles in length, and the incline 1 in 16. Two engines have been ordered from Glasgow. A similar line has been constructed in Tasmania, and is working satisfactorily.

"I expected to see more in the way of light railway construction in America than I did. Where you see the light lines is in the prairie districts, which are admirably fitted for them. Many of these lines are not ballasted, not because American engineers do not consider ballasting necessary, but because they either have not the money or are unable to obtain the ballast."

Submitted by David Whiteford



BOOK REVIEW

THE BRIEF HISTORY OF THE LAUNCESTON & WESTERN RAILWAY 1867-1904 Compiled by Brian R. Chamberlain and published by Regal Press, Launceston. 74 pp illustrated with soft cover.

Hitherto unknown private researches into the fascinating history of railways and tramways in Tasmania is becoming habit-forming! The latest evidence being the above title which reached this reviewer recently. The author has gathered a multitude of factual reports in the language of those early days which he has skilfully and interestingly combined in this 74 page soft cover booklet, covering the original broad gauge Launceston-Deloraine line.

Together with some illustrations of the former Company's rolling stock and several lineside scenes, the reader is given a fulsome word picture of Tasmania's short-lived pioneer railway company, which failed due to a combination of adversities in the winter of 1872, just 19 months after its formal opening.

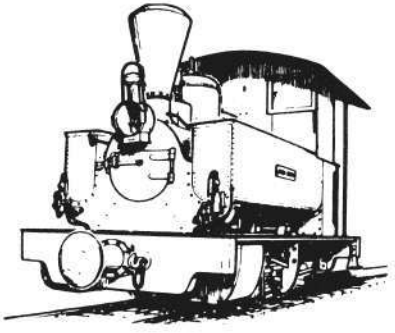
Taken over by the Government, which restored the service, from 12 August 1872, the former Company's four Stephenson 4-4-0T locomotives and 100 items of rolling stock maintained the service until eventually broad gauge was phased out by 1888; there having been mixed 5ft 3in and 3ft 6in gauge with a third rail since 1885.

Three of the four locomotives later came to the mainland and provided a study of their own, unfortunately not recounted in this booklet. The fifth, ordered by the Company, but delivered to the Government after the takeover, made history of a sort in its subsequent conversion to 3ft 6in gauge as the only single driver 4-2-2 known on narrow gauge, which is another story.

Fare schedules, timetables and details of employees and the principal shareholders and officers are all included together with a selection of portraits of some of the office-bearers.

One hopes a subsequent edition will include more details and illustrations, but this will depend upon sales of the present volume which is well worth its retail price of $8.95 a copy. At this stage copies are available only from Regal Press, 80 Elizabeth Street, Launceston, Tasmania, 7250.

Jaybee



LETTERS

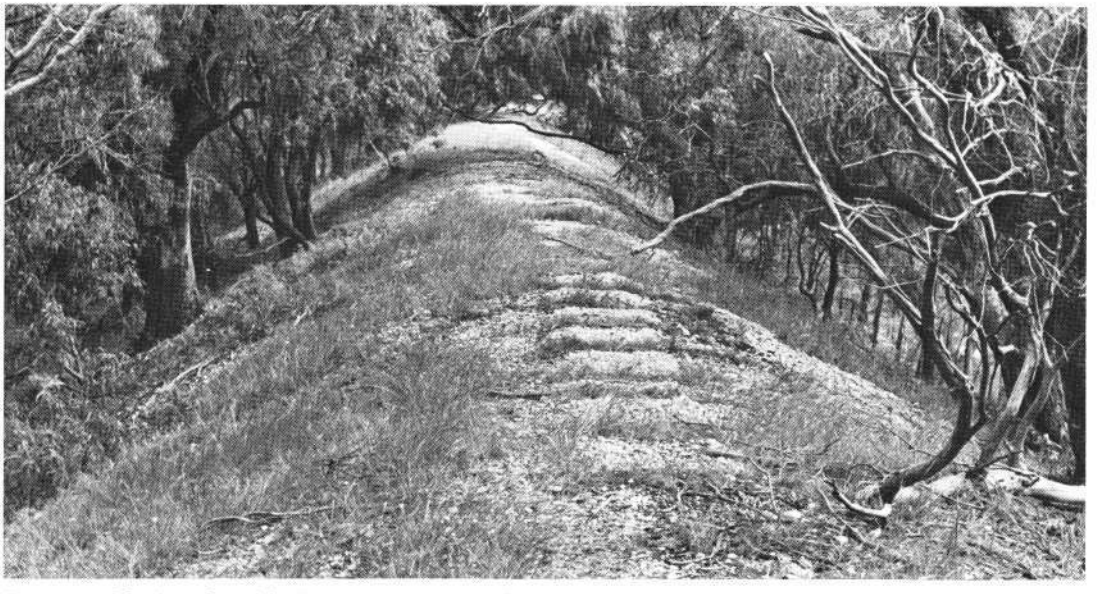
MORIAC TO WENSLEYDALE RAILWAY, VIC. I enclose a photograph taken during a Rail Tourist Association hike along the remains of the VR Moriac-Wensleydale line on 30 October 1983. It shows the remains of the narrow-gauge tramway which connected the Geelong Gravel Conference quarry to the loading bins on the VR siding near Gherang. The tramway at this point was on a fairly high embankment and I took the photo at the sport where the embankment finished and the track was carried by bridgework to the unloader. A similar view appears on page 43 of *Saddle Line*, by Norm Houghton. He refers to the siding and quarry under the titles 'Geelong Gravel Conference' and 'Gherang Gravel Conference'. I am not sure which is correct.

THE PENGUIN TRAM, LR.87 What a gem of an issue *LR.87* is - particularly the major article on a hitherto unknown (to me) line. The photo on p.12 is just like so many mini cameos on model lines which I always felt could not possibly occur in real life!

Some corrections/questions/comments:

p.2 balance should read balanced; facits should read facets; editors should read editor's; Gorogie should read Georgie.

p.3 In what process was the iron ore used as flux? Flux in this context means purifying agent. Normally one associates another agent as the



Formation of Geelong Gravel Conference ng tramway in October 1983. Photo: R.A. Smith

flux for smelting iron from iron ore.

p.5 lone should read long. Does the statement '... there were little bridge abutment earthworks' mean that the bridges were small, requiring small abutments or were there few bridge abutment earthworks?

p.19 principle should read principal;

p.22 Mews should read Mewes;

p.24 Regining should read Refining.

RB Smith
Surrey Hills, Vic.

POWELLTOWN Since publication of *Powelltown*, Arthur Winzenreid has forwarded me a copy of an internal Victorian Railways memo dated 6 January 1922, which was written by a VR engineer after he visited Powelltown at the request of the Forests Commission. This was the time the FCV was proposing the construction of a passenger car for the bush line (see *Powelltown*, p. 52).

The engineer confirmed what I had suspected; the first passenger car was built on a VR narrow-gauge wagon underframe, the bogies being altered to 3ft gauge. The body was built at Powelltown by two car builders sent up specially from Newport.

The second passenger car was built without the assistance of the VR. The FCV's proposed bush passenger car was intended to be built on a VR underframe, with an entirely new design of body.

The book makes brief reference to the diversion of the tramway from the centre to the side of the road at Yarra Junction (p.128, and map on p.17), and refers to sleepers still being visible at this location. Unfortunately these sleepers were obliterated late in January 1985. I was told that this diversion was very rough, and it was not uncommon to see many wagons derailed and spread all over the road.

Frank Stamford
Canterbury, Vic.

COFFS HARBOUR RAILWAYS: LR.86 Congratulations to John Kramer for the Coffs Harbour issue of *Light Railways* (No. 86).

A couple of minor points of correction should be noted on page 28. The *Simplex* loco was built by Motor Rail Ltd. (not "Motorail"). Secondly, the *Planet* loco was built at Park Royal, London (not "Royal Park").

More information has come to hand about the *Planet* since I supplied John with the information on p.28. Although the chassis plate on this loco appears to be dated 1954, makers records now reveal that the loco left the works on January 31st of the following year, so the date of building should be more correctly given as 1955.

John Browning
Mackay, Qld

Since publication of *LR.86* on Coffs Harbour I have received information from Noel Thorpe, Honorary Archivist for the Metropolitan Water, Sewage and Drainage Board, concerning Manning Wardle locomotives Nos. 1780 and 1781. In part Mr Thorpe comments:

It is with regret that I have to advise you that some of the information in my letter of 6th January, 1982 relating to the Manning Wardle locomotives, used on the construction of Potts Hill Reservoir No. 2, is incorrect.

The source of the information given you was the plant file dealing with locomotive No. 4 and the historical details recorded therein were accepted, in good faith, as being a factual historical summary of the locomotive's service. However, certain other information on file and further research has confirmed that the summary was, indeed, inaccurate.

The two Manning Wardle locomotives (B/Ns 1780/1781) together with a Bucyrus locomotive steam shovel and a number of Western dump cars, were offered to the Board by the Public Works Department early in 1913 (Board minute of 17.2.13). This equipment was referred to as being used on the construction of sections 3 and 4 (Dungog-Gloucester, Gloucester-Taree) of the North Coast Railway. The clear inference was that the work was being carried out by the Public Works Department.

After seven months of negotiation the Board accepted the Department's offer at original cost less 15 per cent depreciation (Board minute of 1.10.13). At Board meeting of 10th December, 1913 advice was received that the subject plant - Bucyrus shovel, two locomotives and dump cars had arrived at Potts Hill during the previous week.

No reference is made at any time to Norton Griffith and Company and the locomotives certainly were never at Coffs Harbour.

The number 3 and 4 were given to the engines by the Resident Engineer at Potts Hill to fit in with the numbers 1 and 2 borne by the American Vulcan locomotives.

Locomotive No. 4 was transferred to Ryde water pumping station, the date of Board's approval to such transfer being 26.4.23. The date of disposal of No. 3 is still not known.

John Kramer,
Woolgoolga, NSW

Tasmanian Government Railways

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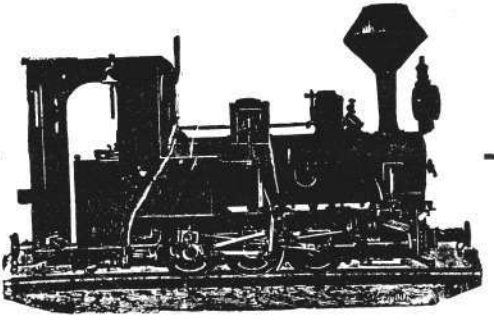
Ditto, on Saturdays, 16s. 6d. first, 13s. 6d. second class.

JOHN M. McCORMICK,
General Manager.



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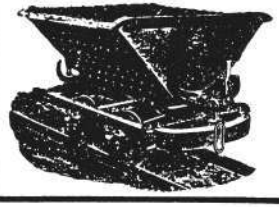

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Top: Advertisement from the *Pictorial Guide to the West Coast of Tasmania*, December 1908.
Bottom: From the *Australian Mining Standard and Electrical Record*, 5 May, 1909.