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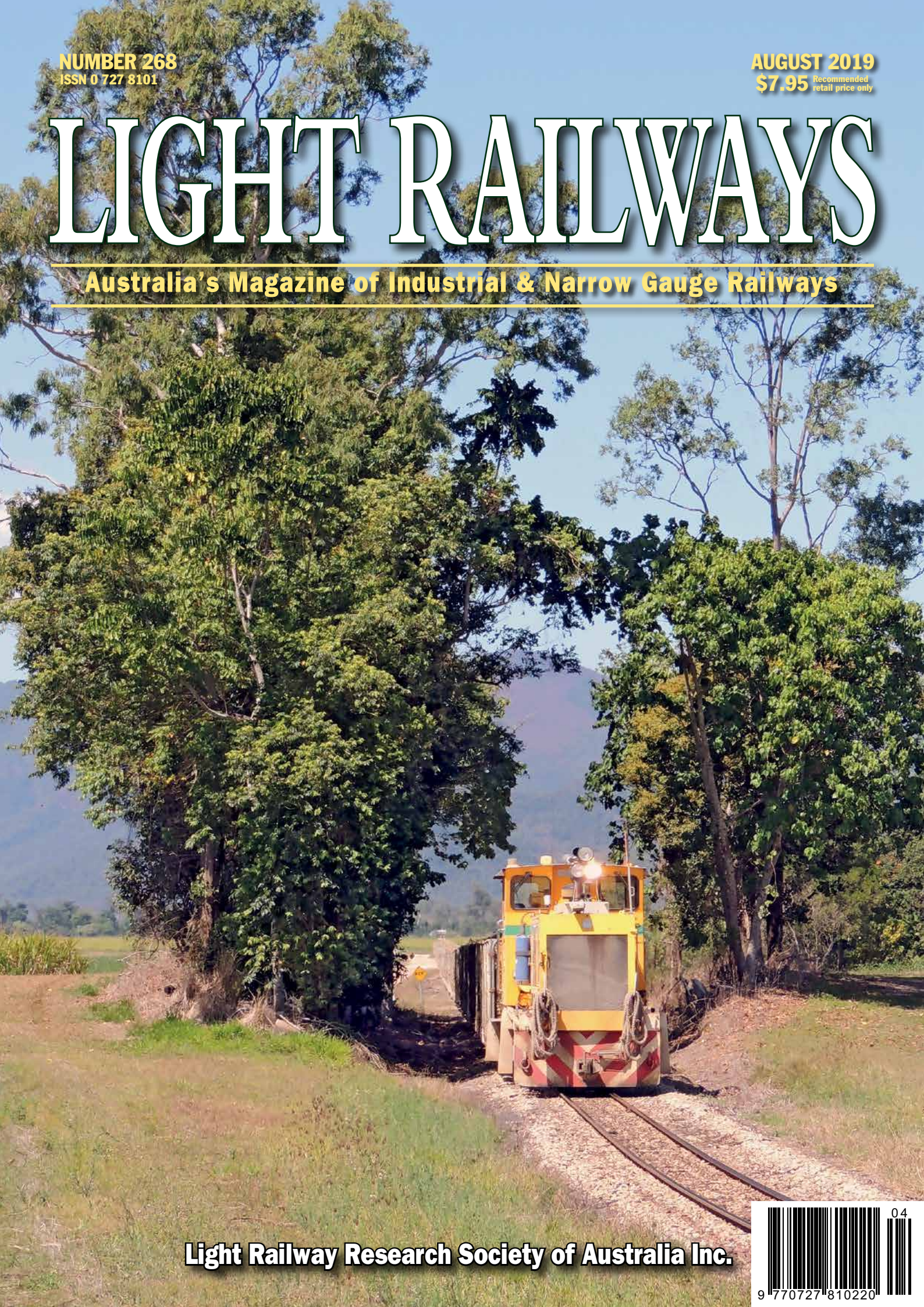
# LIGHT RAILWAYS

Australia's Magazine of Industrial & Narrow Gauge Railways



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**Imperial to metric conversions:**

| | |
|---|---|
| 1 inch (in) | 25.40 millimetres |
| 1 foot (ft) | 0.30 metre |
| 1 yard (yd) | 0.91 metre |
| 1 chain | 20.11 metres |
| 1 mile | 1.60 kilometres |
| 1 ton | 1.01 tonnes |
| 1 pound (lb) | 0.454 kilogram |
| 1 acre | 0.4 hectare |
| 1 horsepower (hp) | 746 Watts |
| 1 gallon | 4.536 litres |
| 1 cubic yard | 0.765 cubic metres |
| 1 super foot (sawn timber) | 0.00236 cubic metre |

# LIGHT RAILWAYS

**Australia's Magazine of Industrial & Narrow Gauge Railways**

**No 268 August 2019**

## Contents



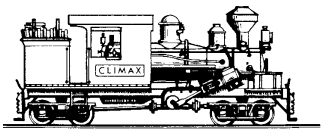
## Editorial

One of the many challenges of being the Editor of this magazine is the choice of a cover photo for each edition. A lot of effort goes into making the decision, firstly in collecting some candidates, and then making the actual decision. The photo on the cover of this edition is an excellent example of what makes a good cover photo. It was originally submitted to the Editorial team as a possible photo for the Industrial Railways News section but we recognised its qualities and quickly set it aside for further consideration as a cover. We thank Luke Horniblow for submitting it.

There could be a long discussion as to what constitutes a good cover photo, but what we are generally looking for includes something that has a strong level of interest, good light and colours, a high level of detail and a focus on what the subject is doing. Whilst it is not always possible, if the photo relates to an article within the magazine, that is always a positive as well.

If you have a possible cover photo or know of one, I would love to hear from you. Please submit them to editor@lrrsa.org.auor contact me on this address. This is another bumper 48 page issue with lots of material to interest our readers, including the final installment of Ian McNeil's excellent series on the railways used at the Clarence River breakwater construction site over an extended period. I trust you will enjoy it all. *Richard Warwick*

***Front Cover:*** *Victoria Mill's EM Baldwin B-B DH* Gowrie *(7135.1 7.77 of 1977) grinds its way through Long Pocket on the long climb up from the Herbert River bridge on 4 October 2014. Photo: Luke Horniblow*




**Light Railway Research Society of Australia Inc. A14384U**
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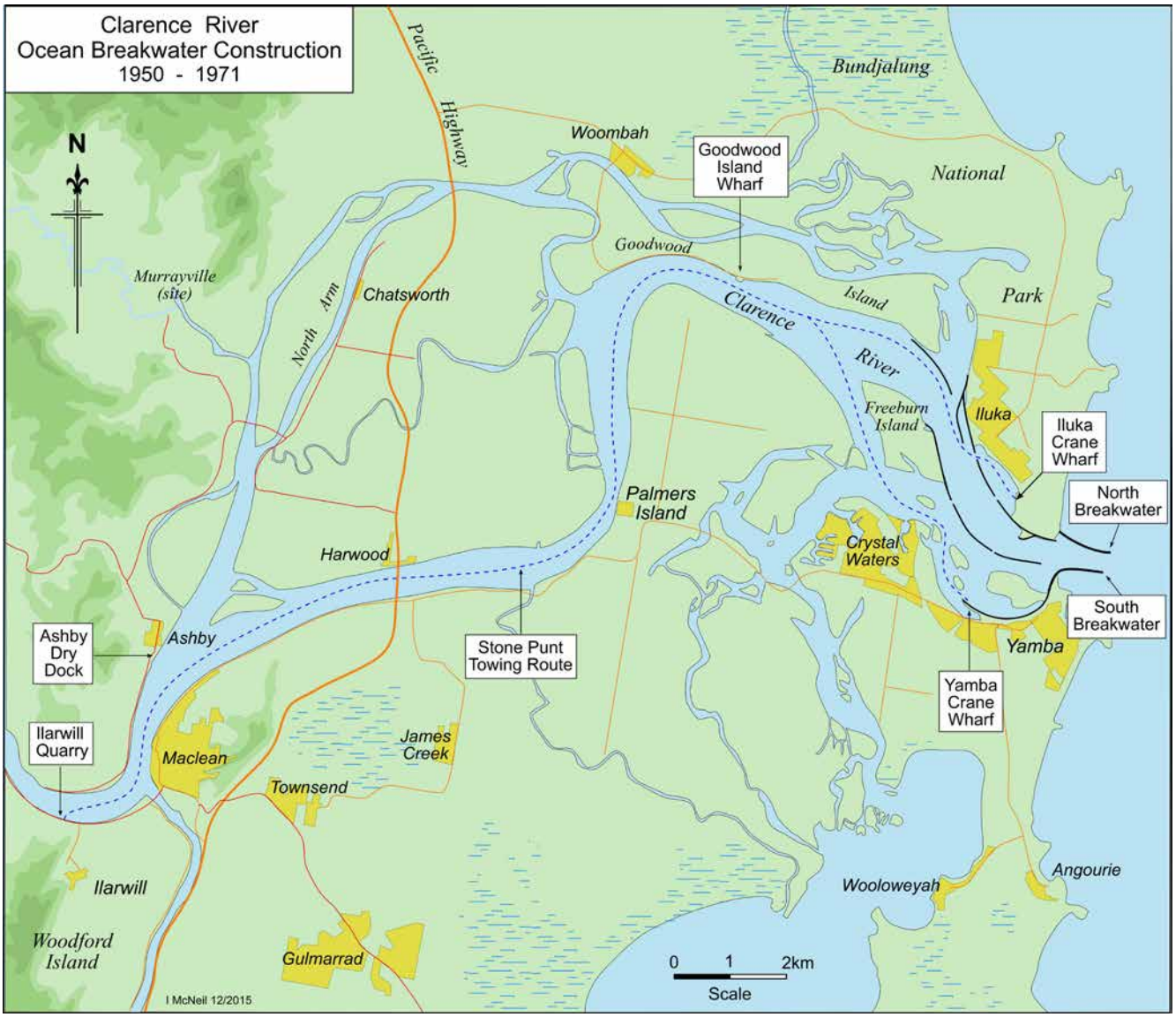
The Light Railway Research Society of Australia Inc. was formed in 1961 and caters for those interested in all facets of industrial, private, tourist and narrow gauge railways in this country and its offshore territories, past and present.

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



Articles, letters and photographs of historical and current interest are welcome. Contributions should be double spaced if typed or written. Electronic formats accepted in the common standards.




*Over a 20-year period nearly one and a half million tons of stone boulders and 40-ton concrete blocks were shipped from Ilarwill Quarry 15 miles down the winding Clarence River to construct the ocean breakwaters at the river entrance.*

# The Clarence River Breakwater Story
## Part 5 – The Ocean Breakwaters

*by Ian McNeil*

### Introduction

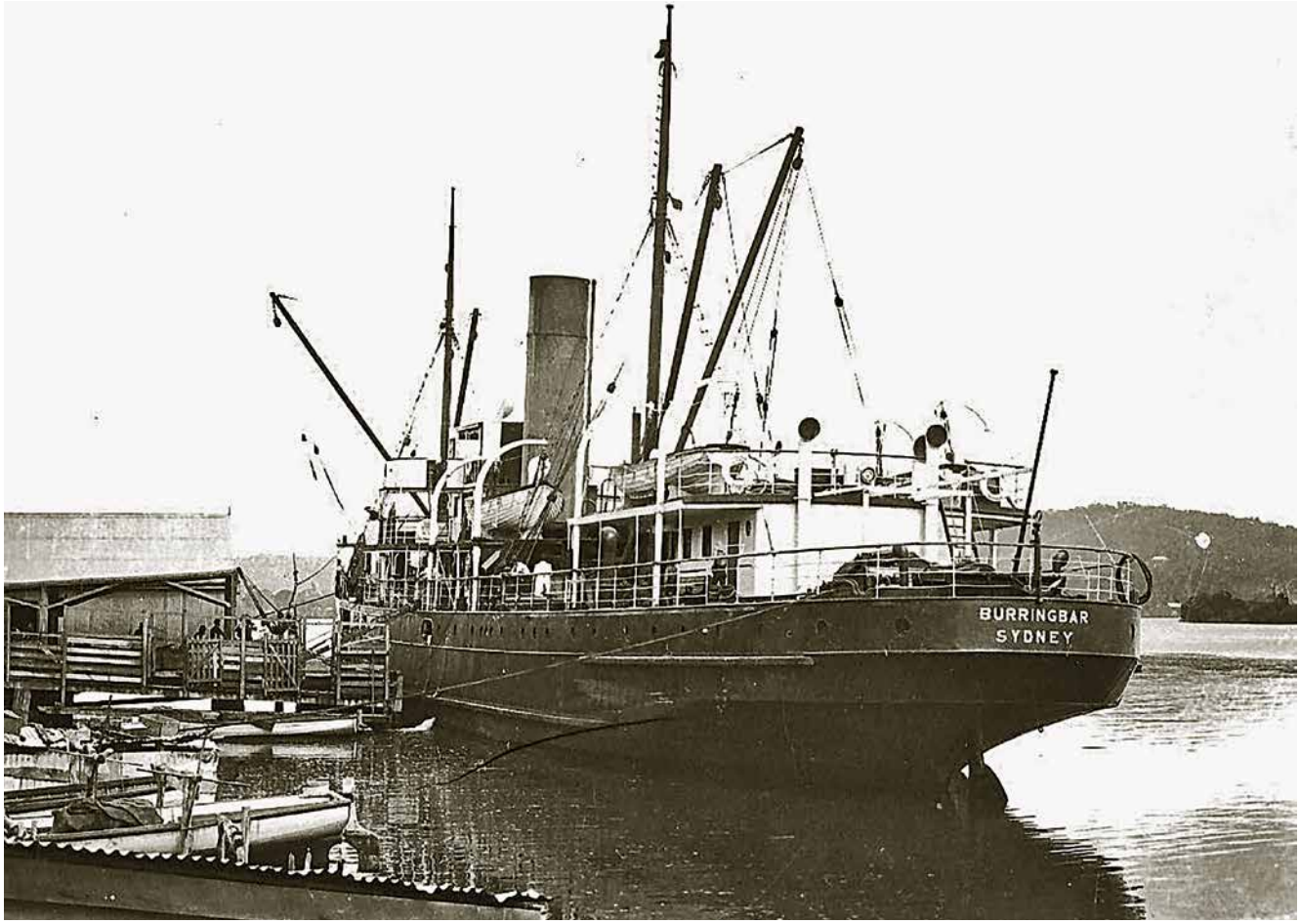
The Clarence River is the largest river system on the NSW coast. For over 100 years it was a busy maritime highway for the movement of people, goods and produce. However the unstable river entrance was hazardous for shipping. It was obstructed by an off-shore bar, a mid-channel reef and inshore sandbanks, and the shallow channels around these obstacles shifted unpredictably. Successive NSW Governments strove to improve the navigational safety of the entrance in order to foster trade and encourage development.

This is the fifth in a series of five articles covering the 100-year history of the Clarence River breakwaters and training walls at the river entrance, and the railways used in their construction. Parts 1 and 2 (*Light Railways* 245 and 248) related the history of Edward Moriarty's unsuccessful 1860s-era river entrance improvement scheme. Parts 3 and 4 (*Light Railways* 255 and 262) told the story of the successful replacement training wall system designed by Sir John Coode in the 1880s.

Part 5 covers the belated construction of the ocean breakwaters at the entrance, some 100 years after they were first recommended, and coming far too late to benefit the shipping trade they were designed for and which had become irrelevant by the time they were completed.

### The Limitations of the Training Wall System

The last of Sir John Coode's inner training walls – the Iluka Training Wall – was completed in August 1903. The construction of Coode's ocean breakwaters had not been attempted, and although Coode had considered them essential to the success of the scheme, the harbour works were closed down, the workmen discharged, and the construction plant removed or sold off. Government policy regarding river entrances had changed. It considered the huge amounts of money expended on breakwaters could not be justified in terms of the present or prospective trade to the river ports.




*The 876 ton* Burringbar *was one of the largest North Coast Steam Navigation Company's steamers able to negotiate the shallow reaches of the Clarence River all the way up to Grafton. Scheduled passenger services to Sydney were withdrawn in 1927, unable to compete after the North Coast rail link was completed.* *Photo: Norman Brown collection*

In the case of the Clarence River, it was confident that its fleet of modern dredges would be able to maintain a minimum depth of 12 feet of water in the shipping channel at far less cost.

However, as Sir John Coode had foreseen, without the protection of ocean breakwaters, large quantities of sand were continually driven into the mouth of the river by tidal flows. By 1908 the Public Works Department dredges had given up on the task of trying to keep a shipping channel open from Yamba wharf to the sea. The continued build-up of sand and sediment across the mouth of Yamba Bay led to the formation of Hickey and Dart Islands which today block off ocean access.

The Chief Engineer for NSW Harbours and Rivers Department, Ernest de Burgh, gave evidence on this issue to a Public Works Committee in January 1912.[1] He highlighted his two main problem areas – shoaling on the off-shore bar and the shallow Iluka crossing.

He explained that while modern bar-dredges such as the *Antleon* were capable of carrying out dredging operations in the shipping channel across the bar under most sea conditions, one heavy storm could undo weeks of work. In addition, there were many calls for the *Antleon* to dredge entrances up and down the coast, and she was not always available for service on the Clarence.

His second and more serious problem was the losing battle being fought on the Iluka Crossing. This was the channel near the end of the Goodwood Island Training Wall where the strong flood-tide currents slowed down and dropped their loads of suspended sand. He had the powerful sand-pump dredge *Juno*, capable of moving 500 tons of sand per hour, permanently stationed on the tortuous channel at the Crossing. It was costing his Department over £8,000 a year on dredging operations on the Clarence.

The North Coast Steam Navigation Company (NCSNCo), the dominant shipping line servicing the NSW North Coast, wanted to run its larger and more modern steamers such as the 1300 ton steel-hulled *Orara* upriver to Grafton. It made one trial but could not get past the Iluka Crossing and abandoned the attempt. The Grafton-based Clarence Navigation Committee continually lobbied for additional dredging and a more permanent solution to the problem.

A slight improvement to the situation on the Iluka Crossing was achieved in 1917. A channel was cut through the Goodwood Island Training Wall to re-direct the flow of the North Arm of the Clarence into the main shipping channel. It was not a permanent solution, and in fact only moved the problem a short distance downstream. The main cause had not been addressed, the large quantities of sand coming into the river mouth from the sea.

## The Clarence River Northern Breakwater Act of 1919

It was not until after the First World War was over that the NSW Government was able to act. On 5 December 1919 it passed the *Clarence River Northern Breakwater Act*, 1919. The Act authorised a 3100 ft extension of the Iluka Training Wall at an estimated cost of £340,000. Essentially this was a scaled-down version of Sir John Coode's planned north breakwater – he had recommended the breakwater should be separated from the Iluka Training Wall to create a wave trap which would calm the waters inside the entrance.

Work began in early 1920 to reopen Woodford Island Quarry to provide stone for the breakwater. The Public Works Department

began readying a small fleet of wooden punts to ship stone down to Iluka. Plans were laid to obtain steam cranes for Iluka from Port Kembla and from the Richmond River entrance. Quarry cranes, a locomotive and rails were to be obtained from Port Kembla and Newcastle. Department officers carried out surveys for stone wharf sites at Iluka and Woodford Island.[2]

The project got off to a bad start. The first steam crane sent to the Clarence was lost at sea in July 1920 when the punt carrying it capsized off Crowdy Head while under tow by the tug *Waratah*. Nevertheless, by the end of September the old quarry at Woodford Island had been cleared of scrub, three steam cranes had arrived and were being erected. Wharf construction had begun and workshops erected. Plans were in hand to repair Iluka Wharf and erect a steam crane.

All this came to an abrupt halt in December 1920.[3] The works were closed down and all the staff dismissed. The Public Works Department had spent several thousand pounds of its own limited funds, but the promised Loan Funds from the Government did not eventuate, and it ran out of money to continue the work.

## The Interwar Period

In 1925 the Commonwealth Government commissioned the eminent British civil engineer Sir George Buchanan to inquire into and report on harbour facilities in Australia. During his tour of inspection he came to the Clarence River on 1 July 1925 to inspect the entrance and to confer with local representative bodies.

Sir George presented his comprehensive report to the Commonwealth Government in October 1926. Dealing with the NSW North Coast ports, he said that Byron Bay, the Richmond River, Coffs Harbour and Port Macquarie were capable of being improved for coastal services, while the Clarence River was capable of being made into a first-class harbour for overseas trade. Of the Clarence he said:

> In the matter of harbours for overseas trade, I am distinctly of the opinion that the physical conditions at the Clarence River and estuary, if assisted by a wise, and constant, policy of deepening, flood regulation and estuarial reclamation, will lend themselves admirably to the creation of a first-class waterway and port for deep-sea shipping to the town of Grafton. I should, therefore, place the Clarence River first on the list of all ports above Newcastle for the scientific port development of deep-sea traffic.[4]

This however did not spur either the NSW or Commonwealth Governments into action, and the PWD dredges continued their struggle to maintain a 12 ft deep shipping channel through to Grafton.

The case for the Clarence River to be developed as a port for deep-sea shipping was again promoted in 1933 when the NSW Government set up a New States Royal Commission to inquire into areas of NSW which might be suitable for self-government as States in the Commonwealth of Australia. One of the areas proposed was the State of New England encompassing the NSW North Coast from Newcastle up to the Queensland border and as far inland as Walgett. The Clarence River was again promoted as the logical site for a major port for the new State. Representatives from the Grafton and Maclean Chambers of Commerce gave evidence at Commission hearings to support the case for the Clarence.

However, a different case was presented by the Secretary of the NSW Navigation Department, Mr. H G Faulks.[5] He said that all ports in NSW, other than Port Jackson, were more or less non-paying, and many had been kept open more as a matter of national policy and in the interests of neighbouring districts. Activities at the smaller ports on the North Coast had declined since the opening of the NSW North Coast Railway and the greater use being made of Coffs Harbour as a shipping centre. His department had on several occasions suggested confining sea traffic to a few of the larger ports and concentrating on the proper maintenance and upkeep of those rather than spreading available funds inadequately over the many ports, the maintenance of which involved the State in a loss of nearly half a million pounds annually. In the case of the Clarence the reef at the entrance did not interfere with the navigation of vessels of much deeper draft than those at present trading there. The department considered that the Clarence in its present condition was capable of handling many times the number of ships now trading there.

*The modern twin-screw suction dredge,* H.E. Street*, built in 1949 at Newcastle State Dockyard for service on North Coast rivers, at work in the river channel fronting Ilarwill Quarry. The quarry's 10-ton steam crane is visible behind the dredge, while the vehicle ramp and jaw crusher – part of the concrete block plant – can be seen to the right of the ship's bow. Photo: Norman Brown collection*

## The Post-World War 2 Reconstruction Programme

There were no further developments in the years leading up to the outbreak of the Second World War, and during the war years there were no resources available for anything not connected to the war effort. Nevertheless the Grafton Chamber of Commerce and other local bodies continued to promote a deep-sea port on the Clarence as being in the national interest. Towards the end of the war, thoughts turned to the post-war reconstruction programme.

In April 1945 the NSW Government set up an expert committee to decide whether a deep sea port should be constructed on the North Coast.[6] Reporting back in February 1946 the committee concluded that the Clarence River, centrally situated between Newcastle and Brisbane, would provide a harbor superior to any other of the alternative ports - Byron Bay, Ballina, Woolgoolga and Coffs Harbor.

It recommended Iluka as the site for the deep sea port, and proposed that it should be connected to the inland areas of the State by a direct trunk railway to Inverell. It estimated the cost of the project would be £14,486,000. The NSW Premier, William McKell, enthusiastically supported the proposal, saying:

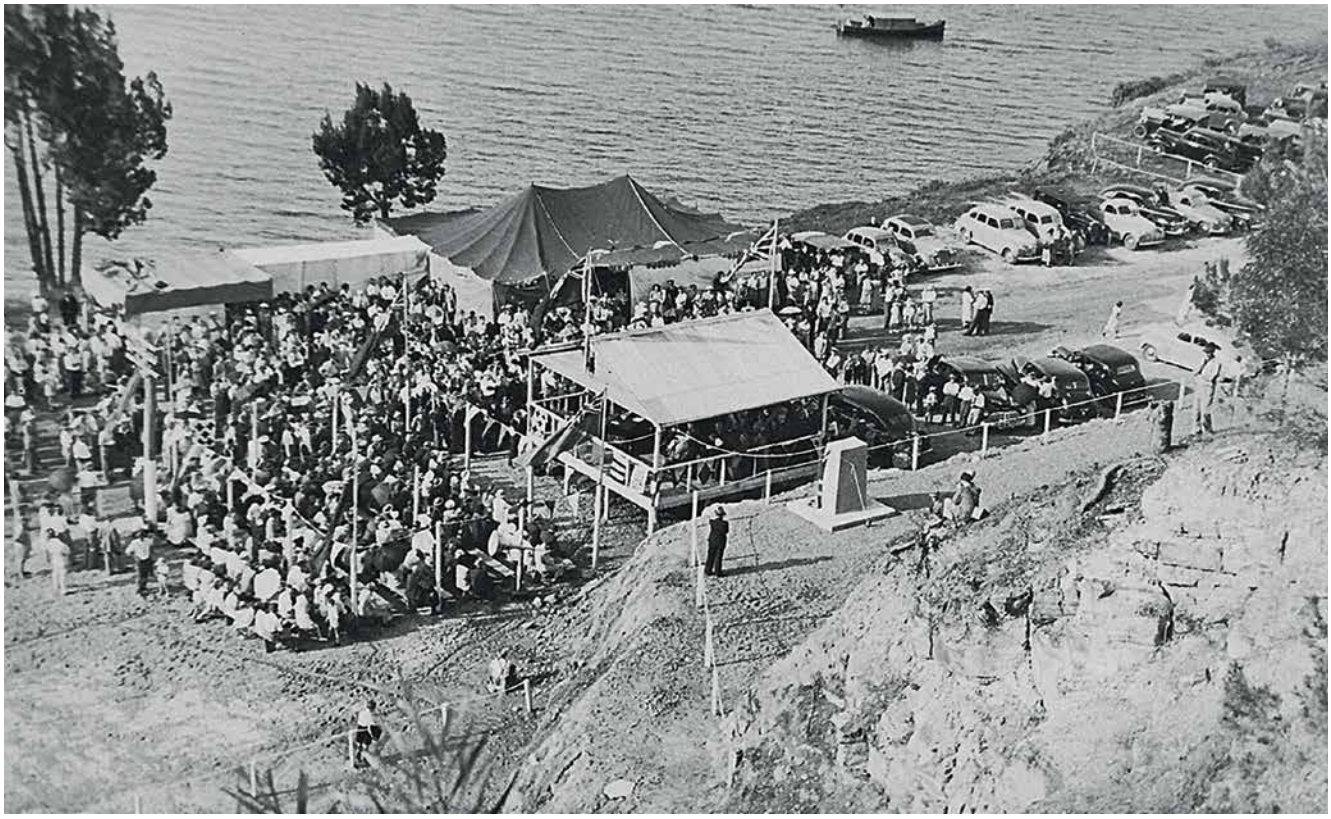
> Establishment of a new port will open up the vast hinterland of the northern part of the State as far west as the Barwon River. As it is, there is no deep-sea port on the coast between Newcastle and the Queensland border, a distance of over 300 miles.[7]

The Committee's report was referred to the Public Works and Railway Departments to carry out detailed surveys on which to base the final estimates for port and railway construction. The Public Works Department estimated the cost of providing a deep water port at Iluka at £3 million. The Department of Railways carried out trial surveys for a railway between Iluka and Inverell via Grafton and Glen Innes. It reported that the construction of a 50 mile rail link between Inverell and Glen Innes would be straight-forward to construct at a cost of £2.7 million. However, a link between Glen Innes, situated some 3500 ft above sea level on the summit of the Great Dividing Range, and coastal Iluka presented serious construction difficulties.

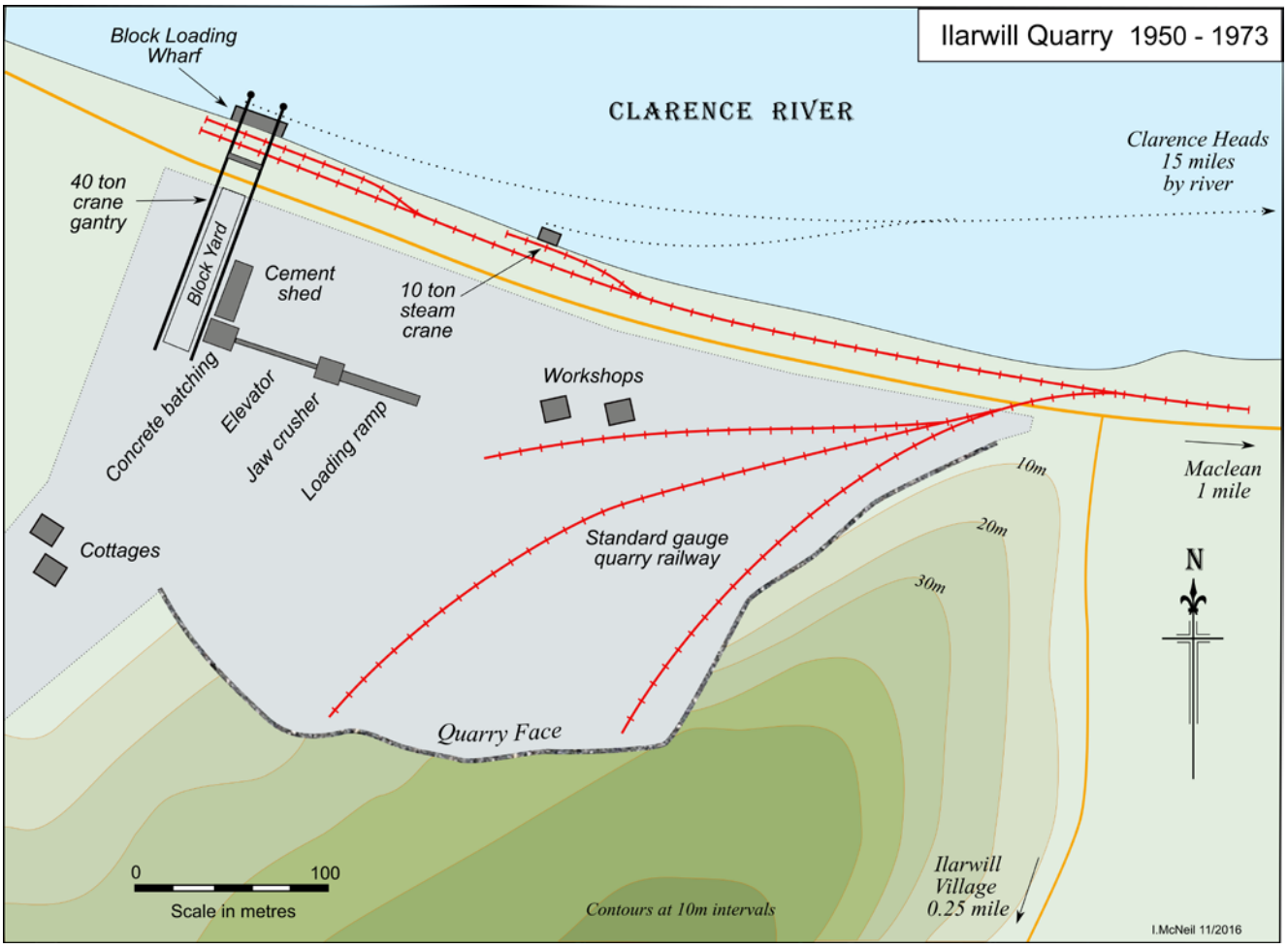
The Department submitted two possible alternative routes to the Government. One was from Glen Innes to Newton Boyd, Jackadgery, Copmanhurst and Iluka costing £18.3 million and the other was from Glen Innes to Newton Boyd, Little River, South Grafton and Iluka costing £15.2 million, both exclusive of land resumption costs. On both routes there were sections where normal railway construction was deemed almost impracticable and where it could only be carried out at very high cost.[8]

Faced with such high costs the Government elected to construct the £2.7 million rail link between Inverell and Glen Innes, and to substitute a £780,000 upgrade of the Gwydir Highway between Glen Innes and Grafton instead of a railway.[9] It passed the Glen Innes to Inverell Railway Act No 7 on 3 April 1950 but faced with a post-war shortage of rails and steel, was unable to proceed with its construction. The scheme to divert wool, wheat and meat exports from north-western NSW to a deep sea port at Iluka was strongly resisted by Sydney interests, and although the Government gave lip service to the rail link, no funds were provided for its construction and the proposal was allowed to quietly lapse.

The *Clarence Harbour Works Act* of 1950, enacted on 24 March 1950, authorised the expenditure of £3 million to effectively complete Sir John Coode's original plan. The key works to be carried out were the construction of a 4200 ft northern breakwater, a 1800 ft extension of Moriarty's southern breakwater, and the removal of the Black Buoy reef at the entrance. The overall aim of the works was to create and maintain a minimum depth of 20 feet of water in the shipping channel at the entrance and across the off-shore bar.



*Sir John Northcott, the Governor of NSW, officiated at the opening ceremony of the breakwater works at Ilarwill Quarry on 25 March 1950, and unveiled the commemorative tablet seen in the foreground. The NSW Premier, James McGirr, fired the first shot at the quarry to mark the occasion. Photo: Maclean District Historical Society*




*Ilarwill Quarry was developed on the site of the 1898 Woodford Island Quarry that had furnished stone for the construction of Iluka Training Wall. The old workings were greatly expanded and a concrete batching plant was installed to produce 40-ton blocks for breakwater construction. One of the most visible structures was the long crane gantry, which straddled the block yard and was used to load the stone punts.*

## Ilarwill Quarry on Woodford Island

The Breakwater Scheme officially commenced at the old Woodford Island quarry on 25 March 1950 when NSW Governor Sir John Northcott officiated at an opening ceremony and unveiled a commemorative tablet. NSW Premier James McGirr fired the first shot at the quarry in front of a crowd of over 1000 invited guests and district residents.[10]

The task ahead of the PWD was formidable. There was no infrastructure in place to produce, handle and transport the 40-ton concrete blocks deemed essential for breakwater construction. Specialised equipment, including a concrete batching plant (£27,000), a rock crushing, screening and storage plant (£32,000), two 40-ton capacity gantry cranes (£61,000), two diesel locomotives and a Halco-Stenuik deep-drilling plant had to be ordered from overseas. The design, tendering, purchase and installation of this plant promised to be a lengthy business. In order to start construction as soon as possible, the PWD gathered up what steam plant it had on hand. Ten-ton steam cranes were installed at Ilarwill and Iluka, and a 10-ton steam locomotive crane was brought in to load stone in the quarry.[11]

There was a considerable amount of preparation work required before the quarry could start sending stone down river. A new village called Ilarwill was laid out near the quarry, but half-a-mile south of the river and out of reach of its periodic floods. Accommodation facilities built there for the quarry work force included staff cottages, single men's barracks, a cookhouse and a mess hall.

Wharfage was constructed along the river bank for the PWD's tugboats, stone punts and dredges. Standard-gauge railway tracks were laid between the crane wharf and the quarry face. A workshop, a blacksmith's shop and locomotive shed were built and a 400 KVa substation installed to supply electricity to the workshop and to the future block-making depot.

The first stone was quarried with the aid of jackhammers driven off portable air compressors. It was used to build a reclamation wall behind the wharves, to build up the wharf approaches and for various road works around the site.

It was over two years after the opening ceremony that the first punt load of stone for breakwater construction was sent downriver on 7 April 1952.[12] Stones up to 10 tons weight, the largest size that could be handled with the available plant, were loaded onto standard-gauge flat wagons by the locomotive steam crane. The diesel locomotives had not arrived from England so tractors were employed to tow loaded wagons to the crane wharf where the fixed steam crane off-loaded the stone into punts moored alongside.

Only 5400 tons of stone had been sent downriver to begin construction of the northern breakwater when all work was suspended in June 1952 due to a shortage of Loan Funds. All the men were laid off with only head ganger Mick O'Reilly kept on as caretaker. Part of his job was to turn on the workshop machinery – lathes, milling machines, air compressors, etc – once a day to keep them in operating condition.

Work did not resume until August 1953.[13] Improved quarrying procedures were progressively adopted as modern plant began to arrive. The locomotive steam crane was replaced by an imported 20 ton capacity diesel caterpillar shovel.


*A 28-ton standard-gauge Ruston & Hornsby diesel locomotive at Yamba Crane Wharf circa 1970. It was one of two locomotives, Nos 310085 and 313393, imported new from England by the PWD in 1952 for the breakwater project. One was employed at Clarence Heads, the other at Ilarwill Quarry.* *Photo: Ron Preston*

The shunting tractors were replaced in June 1954 by an imported Ruston and Hornsby 28 ton 4-wheel diesel locomotive. Jackhammers were replaced by specialised deep drilling equipment capable of boring 4-inch diameter holes down the full 145 ft depth of the tallest quarry face. Gelignite was replaced by ammonium nitrate – fuel oil explosive that returned a consistently higher yield of stone.

The quarry's location close beside the river enabled stone and concrete blocks to be efficiently loaded directly onto punts for the trip down-river to the Heads. But it rendered the quarry vulnerable to river floods. Water inundated the entire quarry, including the concrete block production facility, during the major flood of May 1963 and it was several weeks before production was resumed.

When the 40 ton gantry crane, part of the concrete block manufacturing plant, was commissioned in October 1959, the quarry also began producing 38 ton stone blocks to supplement the relatively slow production of concrete blocks. A typical blast every couple of months involved drilling 28 full depth holes seven feet apart and 14 feet back from the quarry face. These were packed with 1820 lbs of explosive which when set off produced up to 60,000 tons of stone at a time. Over-large blocks were reduced down to 38 ton sizes by boring holes spaced one foot apart in a straight line with a jackhammer. These were loaded with cordex to blow them into 8 ft by 7 ft blocks.

The quarry workshops fabricated 35 tip wagons, subsequently strengthened to carry 40-ton loads, as well as 17 sand skips and 15 sets of points and crossings for the railway sidings at Ilarwill, Iluka and Yamba.

Over the 21-year life of the quarry, almost 1.5 million tons of stone was produced for the breakwater project. Nearly half of that was used in the manufacture of 40 ton concrete blocks. The remainder, ranging in size from gravel up to 38 ton boulders, was sent down river to the breakwaters.

## The Concrete Block Plant at Ilarwill Quarry

The construction of the 40 ton concrete block manufacturing plant and loading facility was by far the biggest and most complicated project undertaken at Ilarwill, and it took nearly nine years to bring into production. It consisted of a stone crushing, screening and storage plant, a 240 ton per day concrete batching plant, and a 576 ft x 60 ft block casting yard straddled by 10-ton and 40-ton overhead travelling cranes. An elevated crane gantry extended 40 ft over the water to enable concrete blocks to be loaded directly onto punts moored beneath.

The preparation of specifications for the concrete block plant, the invitation for tenders for component supply, and the awarding of contracts was not completed until 1952. The major plant items were supplied by English companies and had to be shipped half-way around the world. The concrete batching plant was commissioned in 1957 but it was not until October 1959 that the block casting yard with its 40 ton travelling gantry crane began operation.

Part of the long lead time was attributed to the hundreds of long timber piles that had to be driven up to 140 ft down to solid rock to create secure footings for the crusher, the batching plant, and the overhead crane gantry. The pile-driving crew only had a 40 ft pile driver and had to splice 18 inch diameter piles together to get down the required depth. Each of the 56 crane gantry columns was supported by a cluster of five piles topped by a 3 ft thick concrete footing. No pile-driving could be done during the 1952 – 53 shut-down, and the supply of piles and timber from local forests was held up by excessively wet weather during 1955 – 56. The footings were finally completed in late 1957.

***Above:*** *A short rake of side-tipping and end-tipping standard-gauge stone wagons stabled on the South Training Wall at Yamba, near the 40-ton gantry crane. They were built in the Ilarwill Quarry workshops and subsequently strengthened to carry 40-ton concrete blocks. The NSW PWD used these ubiquitous four-wheelers on breakwater and harbour construction works for over 50 years. Photo: Ron Preston*

***Below:*** *Ilarwill Quarry here seen underwater during major flooding on the Clarence River in May 1963. Sections of the quarry face were over 140ft high and required specialised deep-drilling equipment to bore full-length holes for explosive charges. One of the big diesel caterpillar cranes employed to load stone onto rail trucks is dwarfed by the rock wall behind it. Photo: Norman Brown collection*

***Above:*** *The PWD had no heavy lifting gear available when work started in 1950, and so it installed 10-ton capacity steam cranes at Ilarwill Quarry and Iluka as an interim measure to avoid delays. The Ilarwill crane remained in operation for the whole 20-year project, being used to load smaller stone sizes which were also required for breakwater construction.* *Photo: Norman Brown collection*

***Below:*** *The 60ft 240hp steel-hulled* Iluka *was the second diesel tug acquired by the PWD in 1950 to tow stone punts between Ilarwill Quarry and Clarence Heads. It was built in Canada in 1944 for war service, finishing up in New Guinea from where it was towed to the Clarence by the cargo ship* Admiral Chase. *She had a crew of three who slept on board during the week.* *Photo: Norman Brown collection*

*Blasting operations involving up to 1,800lb charges of explosives were carried out every month or so at the quarry, periodically shaking the nearby town of Maclean. Each blast could bring down anything up to 60,000 tons of stone. About half was fed to through the jaw crusher for the manufacture of concrete blocks, the other half was sized into blocks between five and thirty-eight tons apiece for the breakwaters.*

*Photo: Norman Brown collection*

In full operation the plant produced eight 40 ton blocks a day. Quarry stone was loaded into 4½ cubic yard shuttle dumpers which hauled it up a timber ramp – built with girders recovered from the de-commissioned Woolgoolga Jetty – and tipped into a jaw-crusher hopper. A belt conveyor took the crushed stone to oscillating screens where it was separated into four sizes, maximum 3 inches and minimum below ¼ inch, and sent to storage bins. A belt conveyor fed the aggregate to the batching plant which was equipped with a two cubic yard mixer.

Portland cement was stored in bags inside an elevated shed. A screw conveyor transferred cement to the mixer via a weigh hopper. The 10 ton travelling gantry crane transferred mixed concrete to steel casting forms in the block yard. Each seven foot high, 40 ton block required 25 cubic yards of stone, 129 bags of cement and 450 gallons of water, and took 28 days to cure before it could be lifted.[14]

The plant began producing concrete blocks in October 1959 and continued operating for 12 years with the final blocks being cast in April 1971. During that time, 15,504 blocks with an aggregate weight of 620,160 tons were produced for the north and south breakwaters. The entire plant was among the assets auctioned off in February 1973, and today the only surviving reminders are the old cement shed and the concrete footings of the elevated crane gantry. The nearby substantial concrete block wharf is put to good use by amateur rod fishermen.

## The Clarence River Breakwater Fleet

The PWD assembled a small fleet of vessels to transport quarried stone and 40 ton concrete blocks from Woodford Island Quarry to the crane wharves at Iluka and Yamba.

In June 1951 a contract was awarded to Dayal Singh of Lismore for the construction of five 130 ton capacity wooden hulled punts.[15] He set up up a small shipyard and slipway on the river bank at Maclean where, over the course of the next two years, the five punts were built. The punts were hardly a thing of beauty, being ruggedly built to carry heavy loads and withstand rough handling. Each was 85 ft long by 22 ft wide by 7 ft deep and weighed in at 300 tons. The first four were christened upon launching. *Black Swan* was the first, followed by the *William A Moody* (the PWD's Resident Engineer), the *A C Beattie* (the shipyard manager), and the *J N Schwonberg* (a pioneer Brisbane Water shipbuilder, two of whose grandsons were building the punts.)

In January 1954 the *Black Swan* foundered off Trial Bay while being towed by the dredge *Antleon* to Newcastle, and had to be replaced. Eventually a total of six punts were in service.

Two diesel tugs were acquired, the 240 hp 60 ton steel-hulled *Iluka* and the 270 hp wooden-hulled *Yamba*. The Iluka was built in 1944 on the west coast of Canada and was in New Guinea when the PWD purchased it in 1950. The 60 ft long craft was fitted with cabins for the master and engineer, and had accommodation in the forecastle for a crew of four.[16] The *Yamba* was acquired at the same time and was sent to Newcastle Dockyard for a complete overhaul.

Each tug typically towed one fully-loaded punt down river per trip and brought an empty one back. Loaded punts carried between 120 to 150 tons of rock or three 40 ton concrete blocks. The 15 mile trip from Woodford Island Quarry to either the Iluka or the Yamba crane wharf took between 2¾ to 3½ hours depending on tidal conditions. Each tug would do 1½ round trips per day for four days. On Friday they would do a single round trip so as to be home for the weekend, and start the process again on Monday morning. The tugs were fitted out with kitchen, toilet, shower and sleeping accommodation, and during the week their 3-man crews lived on board. Unlike their fellow workers at the quarry and the breakwaters, the tug crews were not allowed to have a drink after work during the week in case they had to be called out in an emergency.[17]

*The May 1963 Clarence River floods inundated Ilarwill Quarry and its concrete block plant, halting production for several weeks. The pre-flood line of the river bank is marked by the dredge* H.E. Street*, the tugboat* Iluka*, the row of stone punts and the 10-ton steam crane. The extent of the elevated 40-ton crane gantry can be appreciated in this photograph.* *Photo: Norman Brown collection*

The transport of stone downriver was the biggest bottleneck limiting breakwater construction. To accelerate construction, two of the punts were fitted with Harbourmaster outboard motors. These were large self-contained 165 hp diesel-engined units fitted with a five foot diameter propeller, and could easily be moved from one punt to another.[18] They were necessarily slower than the tugs, and could only manage one round trip a day. One loaded outboard punt would leave Woodford Island in the morning, while the other empty punt came upriver from either Iluka or Maclean. They also had a crew of three on board.

When the PWD first opened Woodford Island Quarry in 1899 it also constructed a small dry dock at Ashby, just across the Clarence River from Maclean, to service its small fleet of punts and steam tugs. Between 1956 and 1959 the PWD enlarged Ashby Dock so as to maintain the large modern dredges in service as well as the Clarence Breakwater punts and diesel tugs. New pumps, steel gates and a 14 ton derrick crane were installed and a new wharf constructed. Operations at Ashby Dock came under the control of the Breakwater Authority.

## Motive Power: the Ruston and Hornsby Diesel Locomotives

On 13 November 1950, Ruston & Hornsby (Australia) Pty Ltd cabled an order to Ruston & Hornsby Ltd, Lincoln, England for two small diesel locomotives for its customer, the NSW PWD.[19]

Order No 3614 specified two Ruston & Hornsby standard-model Mark 165DS DM 0-4-0 shunting locomotives, 4 ft-8½ in gauge, weight 28 tons, fitted with a 6VPHL diesel engine. Each locomotive was to be fitted with air brakes, an engine tachometer, an engine water thermometer, two driving mirrors and door locks. Also included was a draw hook 2 ft 9¾ in above rail level capable of taking a load of 6 ¾ tons. Shipping instructions were that each locomotive was to be dismantled to limit the main structure to 25 tons and protected for shipment in tropical climates.

The two locomotives were manufactured at Ruston & Hornsby's Boultham Works in Lincoln, and were assigned Builder's Numbers 310085 and 313393. No 310085 left Boultham Works on 29 February 1952, followed by No 313393 on 30 July 1952. Their arrival in Sydney coincided with the shutdown of the breakwater works due to a shortage of loan funds. They were held in Sydney pending the resumption of work and were not sent up to the Clarence until mid-1954. They were railed to South Grafton railway station, craned onto low-loaders and driven out to Ilarwill Quarry. There was no crane capable of lifting them off the trucks, so the resourceful ganger, Mick O'Reilly, had his men build a pig-sty of sleepers on each side of each truck, jacked the locomotive up and slid girders underneath to support its weight. The low-loader drove out from underneath and the locomotive was lowered to the ground, one sleeper at a time. He said it only took four or five hours to unload each one.

The two locomotives were assembled and given test runs at Ilarwill in June 1954. One of the locomotives was painted light blue and the other a maroon colour, but unfortunately it is not known which one got what colour. All available colour photographs show a faded-blue locomotive on breakwater duty.

One locomotive was stationed at Ilarwill Quarry where its primary task was the haulage of stone from the quarry face to the 10 ton wharf crane for loading onto punts. After the 40 ton gantry crane was commissioned in 1959, quarried stone blocks weighing up to 38 tons were shunted under the gantry crane for loading.

***Above:*** *One of the two 28-ton Ruston & Hornsby DM 0-4-0 diesel locomotives at the head of a rake of loaded stone trucks at Iluka. The 10-ton steam crane's anchor beam crosses the railway behind the trucks and beyond that is the superstructure of the 40-ton electric derrick crane. The rails ahead of the locomotive continue onto the northern breakwater where the load will be deposited. Photo: Maclean District Historical Society*
***Below:*** *Transferring the Ruston & Hornsby diesel locomotive and the stone truck fleet between Yamba and Iluka was done on at least four occasions as construction activity switched between the north and south breakwaters. Here the 40-ton Yamba gantry crane is lifting the locomotive off the stone punt which brought it across from Iluka. A row of chained-down stone trucks await their turn. Photo: Norman Brown collection*

The other locomotive went to Iluka to haul loaded stone trucks from the Crane Wharf to the tip face on the advancing northern breakwater. When construction was switched to the southern breakwater at Yamba in 1960, the locomotive and rolling stock were craned onto punts by the 40 ton Iluka derrick crane. They were towed across the river by tugboat to the Yamba Crane Wharf where the 40 ton portal crane lifted them off. Construction changeovers occurred on several occasions and according to the PWD it took less than two days to move operations from one breakwater to the other.

The two locomotives led apparently uneventful lives on the Clarence for nearly 20 years, and together transported over a million tons of stone and concrete blocks in support of the breakwater construction effort. The last concrete block was tipped at Yamba with great fanfare on 14 May 1971, after which the locomotives and rolling stock were shipped upriver to Ilarwill Quarry for storage.

The PWD held an auction sale of surplus equipment at Ilarwill over two days during 19 and 20 February 1973. Over 1650 items went under the hammer, everything from tarpots to gantry cranes. The two locomotives were acquired by B&H Disposals of Silverwater in Sydney and went to Simsmetal at Mascot in 1974.[20]

No 310085 was cannibalised for parts to keep No 313393 going, and its remains were cut up in November 1979. No 313393 was used by Simsmetal as a works shunter and was rebuilt with an International diesel engine in 1979. It was last seen at Mascot in June 1985, very much out of use, and is believed to have been subsequently scrapped.

## The Northern Breakwater at Iluka [21]

The construction of a 4200 ft long northern breakwater at the mouth of the Clarence River was one of the two major works authorised by the *Clarence Harbour Works Act* of 1950. The design adopted closely followed the recommendations made by Sir John Coode some 60 years previously but which had not been implemented. The starting point for the breakwater was on Iluka Beach, 600 ft north of the seaward end of the Iluka Training Wall. The gap between the two walls was designed to form a wave trap to calm wave action inside the entrance.

Stone boulders and concrete blocks for breakwater construction were to be punted 15 miles downriver from Ilarwill Quarry on Woodford Island. An unloading site was selected on the southern shore of Iluka Bay, 300 yards south of the present day boat harbour. A crane wharf was constructed, and a 10 ton steam crane from Coffs Harbour was overhauled and re-erected on it.

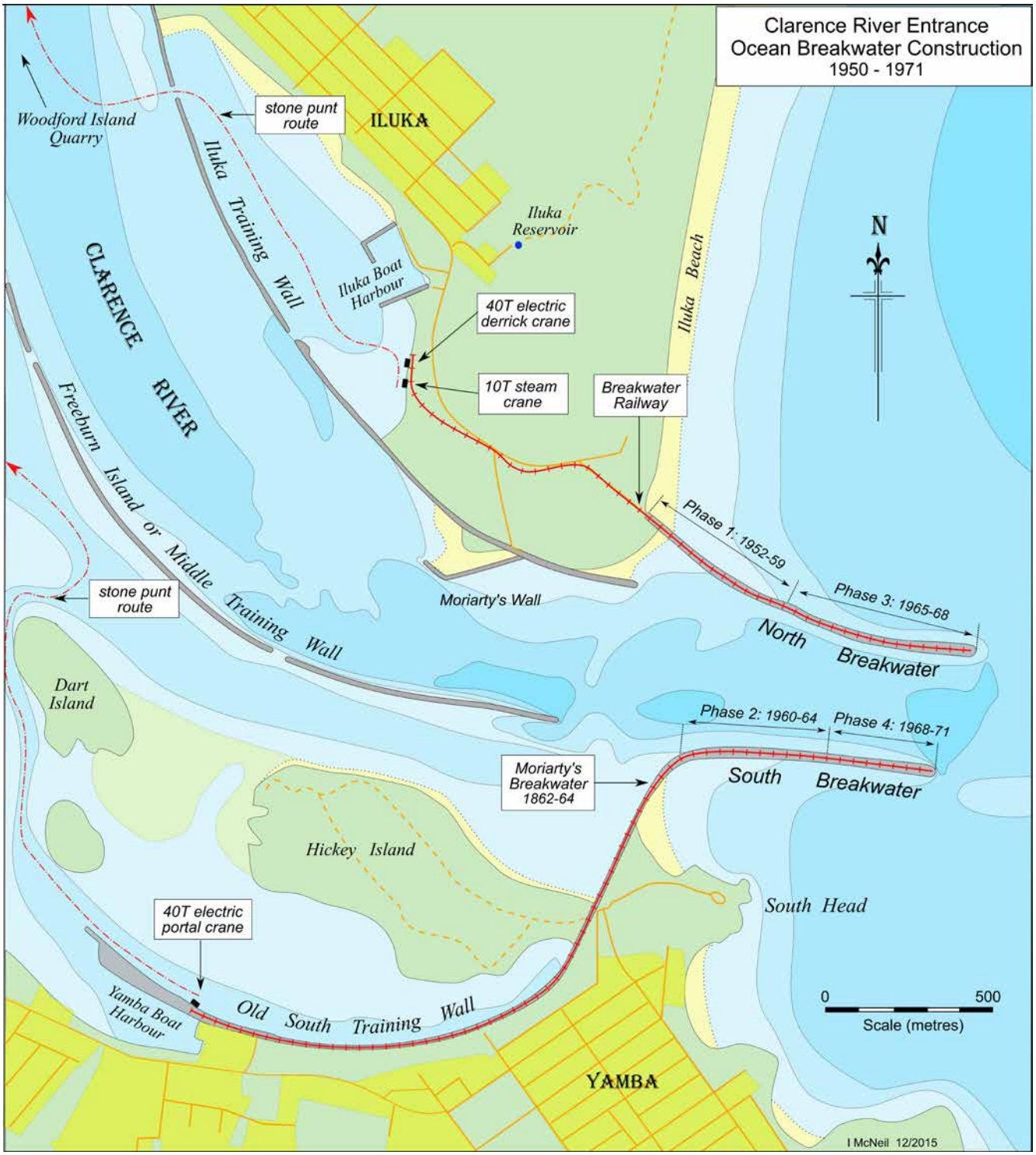
A half-mile long standard gauge railway across the Iluka Peninsula linked the crane wharf to the breakwater start point. Before construction began, the area was an open expanse of shifting sand dunes with little or no vegetation cover. In early 1950 bulldozers were punted downriver from Ilarwill to clear the crane wharf site and level sand dunes along the railway route.

A gang of men was put to work planting marram grass to stabilise adjoining sand dunes. This task continued over several years in cooperation with the NSW Soil Conservation Department. Drifting sand was an early ongoing problem, frequently covering the railway line near the breakwater. The new plantings attracted rabbits which had to be kept away otherwise they ate the new grass cover faster than it could be planted.

Other preparatory works included the provision of accommodation barracks, kitchen facilities and an ablution block for single men, and cottages for the Ganger and Assistant Engineer. A PWD dredge deepened the northern boat opening in the Iluka Training Wall and dredged a navigable channel across Iluka Bay to the crane wharf.

The first of the new 300 ton stone punts, *Black Swan*, was launched in February 1952, and two months later was towed down river by the tug *Iluka* with the first load of stone blocks for the breakwater. The first stone was tipped on 7 April 1952 on Iluka Beach to start the breakwater at a point 150 ft above the high tide mark.

*One of the four-wheel stone trucks was converted into a home-made brake van for use on the breakwater railways. It is not clear how it was used in service, or if it found much use at all.* *Photo: Norman Brown collection*




*The construction of the ocean breakwaters at Clarence Heads between 1950 and 1971 marked the culmination of 100 years of efforts to improve the river entrance for shipping. The breakwaters focussed river currents and tidal scour to maintain a minimum depth of 18ft of water over the off-shore bar. By the time they were completed, unfortunately, coastal shipping had all but disappeared and the entrance was too shallow for the new generation of bulk carriers and container ships.*

When the first load of stone arrived, the railway line to the breakwater had not been finished, and the Ruston & Hornsby diesel locomotive to be used for stone haulage had not arrived from England. Bill Moody, the resourceful Resident Engineer, constructed a temporary roadway and organised an interim service of tip trucks to carry stone from the crane wharf to the breakwater.[22]

This arrangement continued for a few months until 15 July 1952 when a general shortage of loan funds caused many country works programs, including the Clarence River breakwater scheme, to be shut down. By then Bill Moody's men had managed to tip some 6600 tons of stone and advanced the embryo breakwater to chainage 680 ft.

Two years passed before sufficient funding was available to restart work on the northern breakwater. Stone tipping resumed on 17 June 1954. By then two diesel tugs, *Yamba* and *Iluka*, and four 300 ton stone punts were in service to haul stone. There should have been five punts, but the first one, *Black Swan*, had foundered while on tow to Newcastle in January 1954, and its replacement was still under construction in Lismore. Nevertheless, increased tonnages of stone could now be delivered to Iluka crane wharf.

***Above:*** *Two cranes operated on the Iluka Crane Wharf; a 10-ton steam crane installed in 1951 and a 40-ton electric derrick crane commissioned in 1959. Stone embankments and wooden wharves supported the river front railway siding where the cranes loaded stone boulders and concrete blocks onto rail trucks for the short trip to the north breakwater construction site. Photo: Norman Brown collection*

***Below:*** *The 40-ton electric crane at Iluka Crane Wharf prepares to lift a concrete block from the deck of a punt to a waiting rail truck on the wharf, with the cab of the diesel locomotive visible behind. A shackle was screwed into the top of each block prior to lifting. A more relaxed attitude to OH&S prevailed at that time. Photo: Norman Brown collection*


*The lifting gear used on large stone blocks weighed two tons which limited the maximum block weight to 38 tons to enable them to be handled by the 40-ton cranes at Ilarwill, Iluka and Yamba. This block on the deck of a punt at Iluka shows the pattern of holes bored one foot apart with a jackhammer and loaded with cordex to shape it into the required 8ft by 7ft size.* *Photo: Norman Brown collection*

Bill Moody's tipping trucks were no longer needed as the railway to the breakwater had been completed and one of the Ruston & Hornsby diesel locomotives was stationed at Iluka. A small fleet of standard-gauge tipping wagons had been constructed at Ilarwill to carry stone. There were two types; 15 ton capacity box wagons to carry spalls, and 30 ton capacity flat tops to carry boulders. A locomotive shed was built beside the main line a short distance south of the crane wharf.

The 10 ton steam crane lifted stone from the punts to tip wagons which were locomotive hauled to the breakwater tip head. The railway was extended along the top of the wall, keeping pace with construction, with gravel laid down as a base for the sleepers and rails.

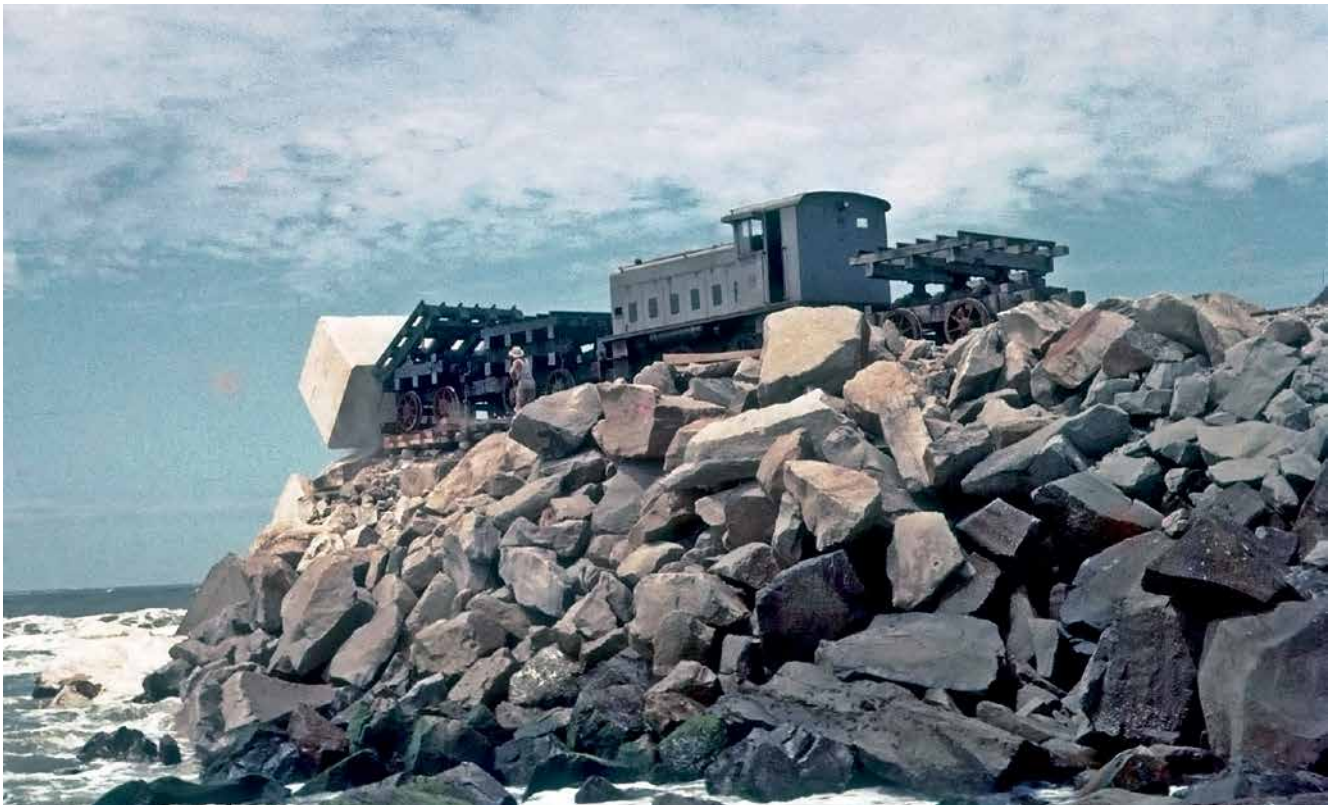
Construction work on the north breakwater continued until December 1959 by which time 195,000 tons of stone had been tipped to advance it to chainage 2359 ft. The wall was 20 ft wide on top with side slopes of two in one. At first it took 100 tons of stone to advance the wall one foot. This increased to over 120 tons per foot as the water got deeper. More frequent subsidence was experienced at the tip head in moderate to rough seas as the breakwater edged out into deeper water.

This initial length of the northern breakwater was constructed of stones weighing up to 10 tons each, the heaviest that the steam cranes at Ilarwill and Iluka could handle. Using these relatively small sizes for breakwater construction was only made possible by the presence of protective shoals in the vicinity. This was fortuitous as it enabled an earlier and less expensive start while the lengthy process of acquiring and installing the specialised concrete block plant and associated 40 ton cranes was underway.

It was not deemed advisable to extend further into open water without a measure of protection from the planned south breakwater which in any case was needed to confine and direct the tidal stream straight out across the bar. Accordingly breakwater construction was suspended on the north side in December 1959. The mobile plant including the locomotive and rolling stock was shipped across the river in January 1960 to begin construction of the authorised 1800 ft extension of Moriarty's southern breakwater.

During the 1954-59 construction phase of the northern breakwater, preparations had also been underway to install a crane capable of handling concrete blocks at Iluka. A 40 ton capacity electric crane with a 45 ft jib had been purchased from the Newcastle State Dockyard in 1951 and stored at Ilarwill pending re-erection at Iluka. Pile driving for the crane footings commenced in 1952, and the massive reinforced concrete footings were poured after the 1952–54 shut-down. The steel superstructure went up in 1957, with motor installation and electrical wiring being completed during the following year. Wharf facilities were constructed adjacent to the crane and breakwater railway sidings extended beneath it. The tall superstructure of the completed crane dominated the skyline on the Iluka waterfront for years and was the subject of many a photograph. It was finally commissioned in late 1959, and one of its few jobs that year was to crane the Ruston & Hornsby diesel locomotive onto a punt to go over to Yamba.

The Clarence River suffered major flooding in May 1963, which badly shoaled the Yamba Back Channel used by the stone punts to get to the Yamba crane wharf. Construction work was switched back to the northern breakwater for several months while PWD dredges laboured to reopen the channel. This provided an opportunity to repair sections of the wall damaged during previous storms and by a cyclone in April 1962, and to advance the wall by 32 ft.



*Over she goes! A 40-ton concrete block is tipped to begin the 1964 extension of the northern breakwater to its full 4,200ft length. The first 2,360ft was able to be constructed of lighter stones weighing up to 10 tons apiece, due to the presence of protective shoals. The remaining length was in deeper water exposed to the full force of storm waves, and was built primarily with heavier 40-ton concrete blocks and 38-ton boulders.*
*Photo: Maclean District Historical Society*

The authorised 1800 ft extension of the southern breakwater was completed in late 1964, and construction resumed at Iluka to extend the northern breakwater out to its full 4200 ft length. Preparations for a resumption of work included the rehabilitation of the railway from the wharf to the tip head, and the completion of rail embankments and rail sidings under the 40 ton crane. The rest of the wall was to be built with a mix of 40 ton concrete blocks and stone boulders up to 38 tons. The tip wagon fleet was rebuilt to carry these heavier loads. The small fleet of stone punts had been expanded to six, two of them being powered by Harbourmaster diesel outboard engines.

During 1964 the first assessment was made of tidal flows between the two half-finished breakwaters. It indicated that the planned 1400 ft spacing between the breakwaters would not produce a strong enough tidal flow to scour the required minimum of 20 ft depth of water over the off-shore bar. To increase the tidal flow, a decreased spacing of 1200 ft was adopted as a compromise between the requirements of navigation and flood water discharge. The alignment of the northern breakwater was altered slightly to the south from chainage 2003 ft, and the remainder of the wall was constructed along this new alignment.

Finishing the northern breakwater out to its full 4200 ft length took another three and a half years. The small fleet of towed and self-propelled punts delivered up to 3000 tons of concrete blocks and stone boulders a week to Iluka. The 40 ton derrick crane usually unloaded the contents directly onto tip wagons to go straight out to the breakwater tip head. But it could also use its 45 ft jib to stockpile up to 600 tons of blocks and boulders when there were delays.

Loaded side and end-tipping wagons were hauled and propelled to the tip head by the diesel locomotive. Each wagon was clipped to the rails before tipping to prevent it following its 40 ton load into the water. The wagon beds were tilted by means of a hand-operated hydraulic pump.

The northern breakwater was completed to its full length on 31 July 1968. It had taken nearly 16 years to complete and had consumed 244,000 tons of stones weighing less than 10 tons, 140,000 tons of heavier stones up to 38 tons, and 6089 concrete blocks weighing 243,560 tons.

## The Southern Breakwater at Yamba [23]

A 1800 ft extension of Moriarty's South Breakwater was the second of the major works authorised by the *Clarence River Harbour Works Act*, and it closely followed the design recommended by Sir John Coode in 1887. The extension was planned to curve sharply round to the east until it was parallel to and 1400 ft (later 1200 ft) from the northern breakwater. Because of its more exposed location, most of it was to be built with 40 ton concrete blocks.

Site preparations at Yamba began in early 1956. A crane wharf site was selected near the western end of Moriarty's South Training Wall. Over 3000 tons of spalls were carted from Ilarwill Quarry to reconstruct and widen the wall for access to the crane site and for railway construction. A 40 ton electric portal crane for Yamba was acquired from the Malcolm Moore Industries Group and stored at Ilarwill until required. Timber piles were driven for the concrete crane foundations and a wharf constructed alongside.

There was little activity on the Yamba side during the next couple of years. The concrete block manufacturing and handling facility at Ilarwill was not ready and construction work was in full swing on the northern breakwater.

The portal crane was finally installed and commissioned in 1959 and a 2 mile standard gauge railway line laid the full length of the South Training Wall out to the seaward end of Moriarty's South Breakwater. A loop siding was located in the

vicinity of the old South Head Quarry for shunting purposes.

The tidal currents in the main river channel were deemed too strong to risk towing loaded stone punts through the openings in the Freeburn Island Training Wall to reach the Yamba crane wharf. Instead the Yamba Back Channel passing behind Freeburn Island was dredged to open up a navigable channel through quieter waters for the stone punt fleet.

In January 1960 the Ruston & Hornsby diesel locomotive and the tip wagon fleet were punted over from Iluka and work commenced on breakwater construction. 40 ton concrete blocks arrived at Yamba crane wharf on board the small fleet of towed and self-propelled punts. Each punt carried a maximum of three blocks which were unloaded by the Yamba portal crane directly onto flat top tip wagons. Unlike the tall Iluka derrick crane with its 45 ft jib, the Yamba crane was a compact transporter unit which did not have the span to stockpile blocks. Loaded stone wagons were hauled by the diesel locomotive straight out to the tip face and their contents tipped into the sea.

Construction work on the South Breakwater extension continued for the next 4½ years until the last block was tipped in July 1964. There was a pause for a few months when serious flooding in May 1963 shoaled the Yamba Back Channel. Work temporarily switched back to the North Breakwater while the PWD dredges worked to re-open the channel.

During the construction period the PWD had taken regular soundings in the entrance channel, across the off-shore bar and in surrounding waters every month or so to monitor the effect of the advancing breakwaters on the shipping channel across the bar. It found the bar was retreating seawards ahead of the breakwater advance, and although it steadily became narrower and the water depth over it increased, a deep channel was never scoured completely through it as Sir John Coode had predicted. One key finding was that the breakwaters needed to project the same distance into the sea, with their outer lengths parallel, to properly focus the tidal flows and river current for maximum effect across the bar. This was the optimum configuration needed to maintain a minimum depth of 20 ft in the shipping channel over the bar at low water.[24]

This was not the situation prevailing in July 1968 after the 4200 ft North Breakwater had been completed. It projected 600 ft past the end of the South Breakwater and the resulting incompletely-focussed tidal scour left an asymmetrical 16 ft shoal in the shipping channel. A 640 ft extension of the South Breakwater was authorised to correct this anomaly. Work resumed in the late 1968 to firstly repair storm and wave damage that had accumulated over the past four years, and then to extend it to 3260 ft, bringing its end into line with the North Breakwater.

Work on this extension continued for another three years. The greater water depths required larger quantities of construction material for each foot of wall built. The number of expensive concrete blocks required was considerably reduced by Ilarwill Quarry's ability to produce large numbers of 38 ton stone blocks using precision blasting techniques. The last loaded punt came down river on 14 May 1971 amid a great deal of public celebration.

In all it took 315,000 tons of stone and 9415 concrete blocks weighing 376,000 tons to extend Moriarty's 1860s built South Breakwater from its initial 815 ft length out to its full 3265 ft extent. Being more exposed to heavy seas than the North Breakwater, the South was constructed with a higher proportion of concrete blocks and heavy stone.


*A 40-ton electric portal crane was erected on the Yamba Crane Wharf in 1956 to handle concrete blocks produced at Ilarwill Quarry. There was no stock-piling facility, and blocks lifted off punts were placed onto waiting stone trucks to be taken directly to the southern breakwater tip site two miles down-river.* *Photo: Ron Preston*

Head ganger Mick O'Reilly[25] gave an insight into breakwater extension work at the time. One day's work would advance the wall by a foot. The gang would start tipping stone off rail wagons on the left hand side until it was one foot above water. They did the same at the centre, and then on the right hand side. Mick would tell the quarry what was needed at the wall, how many 5 ton or 10 ton boulders to fill holes for example. There were box wagons for spalls, and flat wagons with rails on top for boulders and blocks. There were clips on the wagons to anchor them to one side of the rails to stop them tipping over when blocks were tipped off. They were tipped using a hand hydraulic pump.

When it rained, the men could accept a 'wet pay' of 2 s 3 d and carry on working in rain coats and knee boots. If not they waited 45 minutes, but if it kept on raining they would be sent home and lose a day's pay. They could get more than one 'wet pay' a day. Mostly they preferred to keep working in light rain; in heavy rain they generally knocked off.

As head ganger, Mick had the power to hire and fire. He was firm but fair. He said he gave each man three chances, and was seldom let down. All his men belonged to the AWU but he never had a strike there. His men could have a beer at night, but they had to be fit for work in the morning.

## The Ancillary Works at Clarence Heads

### The Goodwood Island Deep Sea Wharf

Work began in early 1968 on a new $225,000 deep-sea wharf on the south bank of Goodwood Island alongside the shipping channel to serve the export timber trade from the Clarence Valley. A road bridge was built at Woombah to span the north arm of the Clarence River and a sealed road connected the wharf to the Pacific Highway some ten kilometres distant. A contract was let to Dowsett Engineering to drive the piles and install pre-cast concrete deck slabs, and the storage area was cleared by day labour. The construction of the 230 ft long wharf was finished in early 1970.

Unfortunately the wharf saw very little use for timber export or any other purpose, and was roundly criticised as being a white elephant. The new breakwaters had created an 18 ft deep channel at low water across the bar, which was only sufficient for vessels up 7000 tons dwt. Occasional cargoes of treated power poles and building material were exported to small South Pacific island nations in Island Trader class vessels from time to time.

The wharf was rebranded as the Port of Yamba in August 1992 and declared a port of entry after its facilities were upgraded to meet quarantine, customs and health requirements. There were two or three unsuccessful attempts over the next few years to establish regular trading links with nearby island nations. Today the wharf sees only occasional use as a base for contract dredges brought in for the specific projects.

### The Iluka Boat Harbour

Following the completion of the deep sea wharf, work began on the construction of a boat harbour in Iluka Bay to provide improved facilities for the local fishing fleet whose annual catch was then valued at $420,000.

The project involved the construction of an inner harbour breakwater, a wharf and moorings capable of accommodating 30 to 40 vessels, and land reclamation for associated roadworks and paving. The site selected for the boat harbour was 300 yards north of the Iluka Stone Wharf, chosen to avoid a potential clash of interests between tourists and professional fishermen and provided for future expansion. A boat opening for the fishing fleet was cut through the Iluka Training Wall opposite the boat harbour and a 10 ft deep channel dredged through and into the harbour.

*Unloading operations at Yamba Crane Wharf. With no stock-piling ability at the wharf, the diesel locomotive needed to be on hand to draw a train of empty wagons one-by-one under the portal crane for loading.* *Photo: Norman Brown collection*

*An aerial view of the Clarence River entrance taken after both breakwaters had been completed to their authorised limits in July 1968. The unequal lengths diffused the tidal flows, which were then insufficiently focused to maintain the desired 20ft channel depth across the off-shore bar. This was remedied by extending the South Breakwater to same length as the North, which required another three years' work. Photo: Norman Brown collection*

Small stone from Ilarwill Quarry was used to construct the inner walls of the boat harbour which was completed in June 1972 at a cost of $195,000.

Of all the construction works carried out at the Clarence Heads over a 100 year period, the boat harbour is only one that has fulfilled its potential. It provides a base with slipping, repair and mooring facilities for the fishing fleet as well as for the Yamba ferries. And some of the best fish and chips available in the district are to be had at the local Fisherman's Co-operative.

## The Demise of Coastal Shipping [26]

Passenger shipping to the Clarence began to decline soon after the North Coast Railway between Grafton and Sydney was completed in December 1923. The NCSNCo reduced its twice-weekly passenger service to Sydney back to weekly in 1925, and then discontinued it altogether in 1927. As well as suffering competition from the railways, the company was also handicapped by having to ferry passengers between Grafton and Clarence Heads when its larger steamers could not get past the Iluka Crossing.

The NCSNCo continued to offer a twice-weekly cargo shipping service between Grafton and Sydney until 1940 when many of the company's best vessels were commandeered for the war effort. Its trade never really recovered after the war and was dealt a death blow in February 1953. In a move that was condemned as a blatant attempt to eliminate sea competition on the North Coast, the NSW Railways granted bulk-loading contracts at rates 50% below ordinary freight rates. That year, for the first time in 97 years, the NCSNCo made a loss and did not pay a dividend. In February 1954 the shareholders voted to place the company into voluntary administration, thus ending the last scheduled shipping service to the Clarence River.

Aside from the big three ports of Sydney, Newcastle and Port Kembla, the coastal shipping trade to the other 28 proclaimed ports in NSW shrank during the 1960s and had effectively ceased by 1975. Raw sugar and molasses from CSR's Harwood mill were the last bulk commodities to be regularly exported from the Clarence. This required constant dredging of the river channel adjacent to Palmers Island to get the sugar ships through, and this traffic went over to road transport in the early 1980s.

The shipping industry increasingly employed larger and larger specialised ships such as bulk carriers, container ships and super-tankers, and the Port of Clarence with its shallow waterways and limited trade became increasingly irrelevant.

Along with the disappearance of coastal shipping came the dispersal of the PWD's substantial fleet of dredges. A handful of the newer vessels were retained to work the big three ports, the remainder were sold or broken up, including the mighty *Antleon*, once the pride of the fleet.

## The Death of the Dream

The shrinking coastal shipping trade and the developing trend towards the use of large specialised ships weighed against the development of a deep-water port on the Clarence, even before the breakwaters had been finished. Its future was referred to the new State Development Corporation in 1967. The Corporation tabled its comprehensive report in May 1970 and concluded that there was no economic basis for the dream that had seemed so close to coming true.[27]

It found that the new ocean breakwaters, which had cost over $9 million, would enable vessels drawing up to 17 ft to handle the then current annual trade of sugar (50,000 tons), timber (25,000 tons) and fish and prawns (8,000 tons) without any further capital expenditure.

*The diesel tugs* Iluka *and* Yamba *could only achieve 1½ round trips each per day towing stone punts between Ilarwill Quarry and Clarence Heads. To increase stone and block deliveries, two of the 300-ton wooden punts built for the ocean breakwater project were fitted with twin "Harbourmaster" diesel outboard engines and a control cabin. They had a crew of three and could make one round trip each per day.*
*Photo: Norman Brown collection*

However, the original justification for a deep-water port on the Clarence was based on the export of agricultural produce – wheat, wool and meat - from north-western NSW, and this would prove prohibitively expensive. The Railways Department estimated that a rail link from Inverell via Glen Innes and South Grafton, thence from Dilkoon and along the north side of the Clarence to the vicinity of Iluka would cost $88 million to build, $7 million a year to operate and would involve a loss of $3 million a year. In submitting this route, as the least unfavourable, the Department emphasised the unsuitability of the terrain for railway construction and operation.

The PWD estimated it would cost a further $18.8 million, with a $1.2 million annual dredging charge, to deepen the port to 32 ft to allow ships up to 20,000 tons dwt to export wheat and chilled beef and bring in fertiliser and oil products. There would also be significant extra costs to provide wharves, cranes, silos and cold stores at Iluka. In the case of bulk wheat, the Grain Elevator Board had already declared that it would not build a wheat terminal at Iluka, and in any case, an unaffordable depth of at least 38 ft would be needed to accommodate the next generation of giant bulk wheat carriers. An analysis of transport costs showed that it would be at least 50% more expensive to road or rail these commodities to the Clarence than by using existing rail links to the port of Newcastle.

It was finally left to Leon Punch, the NSW Minister for Public Works, to announce in August 1973 that despite all the election promises made, economic realities put a the dream of a deep-sea port at the Clarence 'beyond the desires of any Government.'[28]

## Acknowledgements

A large number of individuals and organisations assisted the preparation of this history with contributions of information and photographs. I am grateful to one and all, but would like to single out for special mention the following; the late Mick O'Reilly, retired head ganger of the Clarence Port Works; Rob Knight from the Port of Yamba Historical Society; Margaret Switzer from the Maclean Historical Society; Janet Hauser from the Iluka History Group; LRRSA member John Browning, and Warrwick Hoad from Angourie.

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# MOONTA IN THE 1890s

Our photograph below is an extract from our centre-page spread which shows Richman's Plant at the Moonta copper mines in the 1890s, or possibly a few years later. Moonta, 166 km north-west of Adelaide, South Australia; was one of the centres of operation of the Wallaroo & Moonta Mining & Smelting Co., the others being the nearby towns of Wallaroo and Kadina. The plant operated from 1869 to the end of mining operations in 1923, crushing and concentrating ore. It was powered by a 32 inch Cornish beam engine. The shell of the building still survives.

At the bottom left of the picture is the tiny 2 ft 9 in gauge 0-4-0WT locomotive (Beyer Peacock B/No. 3057 of 1889) built new for Moonta, where it worked on a short section of its own 2 ft 9 in gauge track between Taylor's Shaft and Richman's concentration plant. This locomotive weighed about 4 tons, and had 5 inch x 7 inch cylinders. At some stage after the photograph was taken the W&M company regauged it to 3 ft 6 in. In the past it has been incorrectly recorded that this locomotive was known as *Cap'n 'Ancock's Pig* at Moonta, but this name applied to another W&M locomotive. An article in the *People's Weekly* in 1940 suggests it was actually known as *Billy Wearne's lokey*, after the driver's name.

They disposed of the locomotive around 1909 and in 1911 it was purchased by sawmiller W R Henry from the machinery dealers Cameron & Sutherland. He used it on a suitably graded section of his timber tramway at Forrest, Victoria. Here it was known as *Tom Thumb*. It only worked until about 1915, but still remained derelict at Forrest railway station in the early 1950s before being scrapped.

The other locomotive in the picture is a 3 ft 6 in gauge Hudswell Clarke 0-4-2ST locomotive, one of eight of this highly successful type supplied to the company. This is probably the first of them: B/No. 394 of 1892, (No.3 on the W&M roster), but it is possibly the second: B/No.550 of 1900 (W&M No.4).

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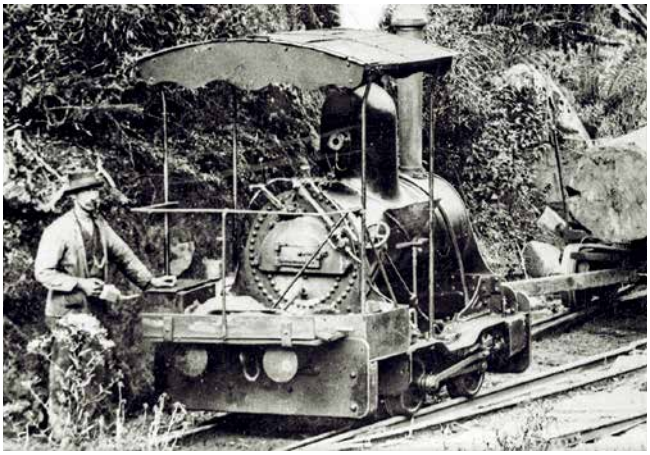
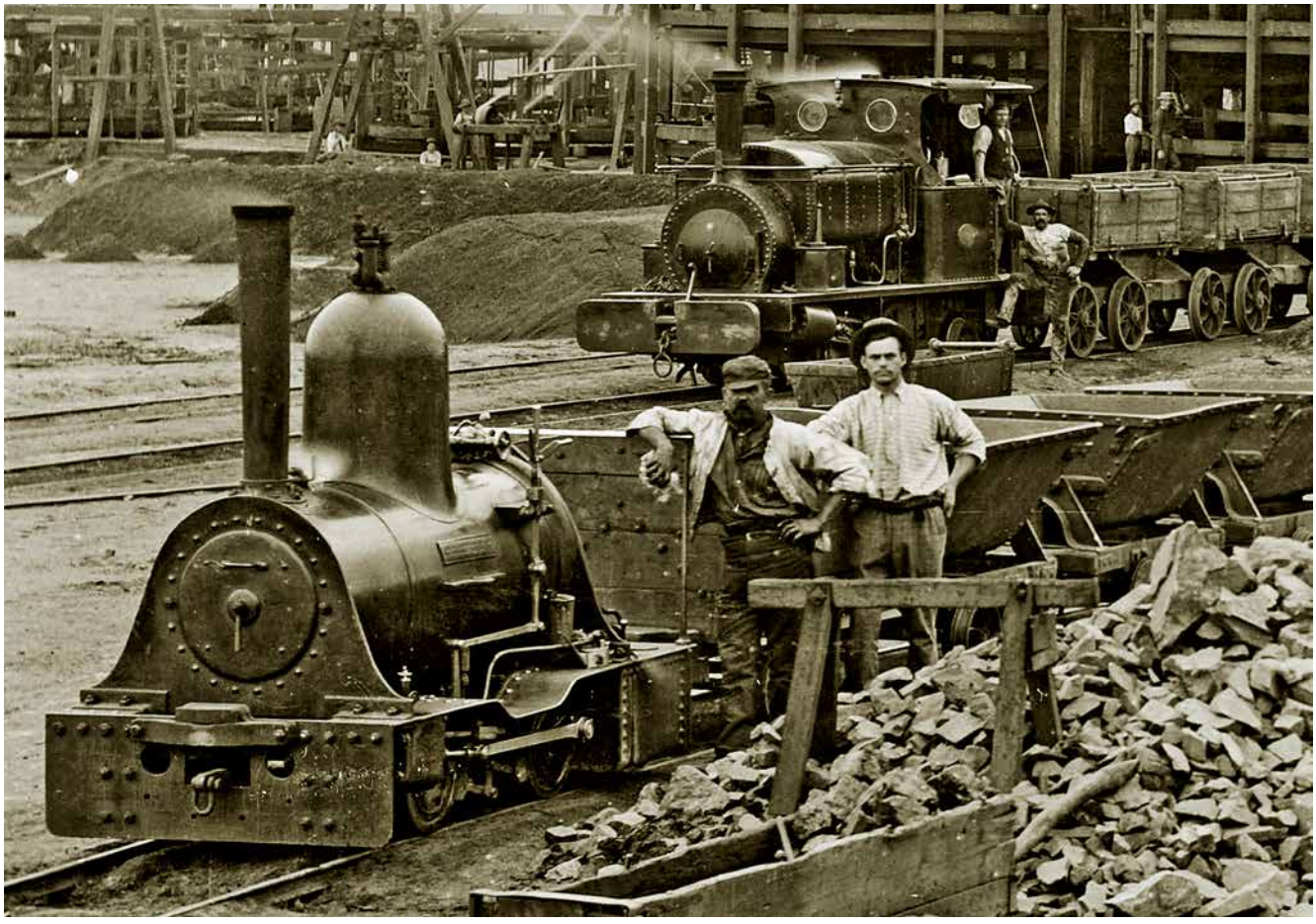
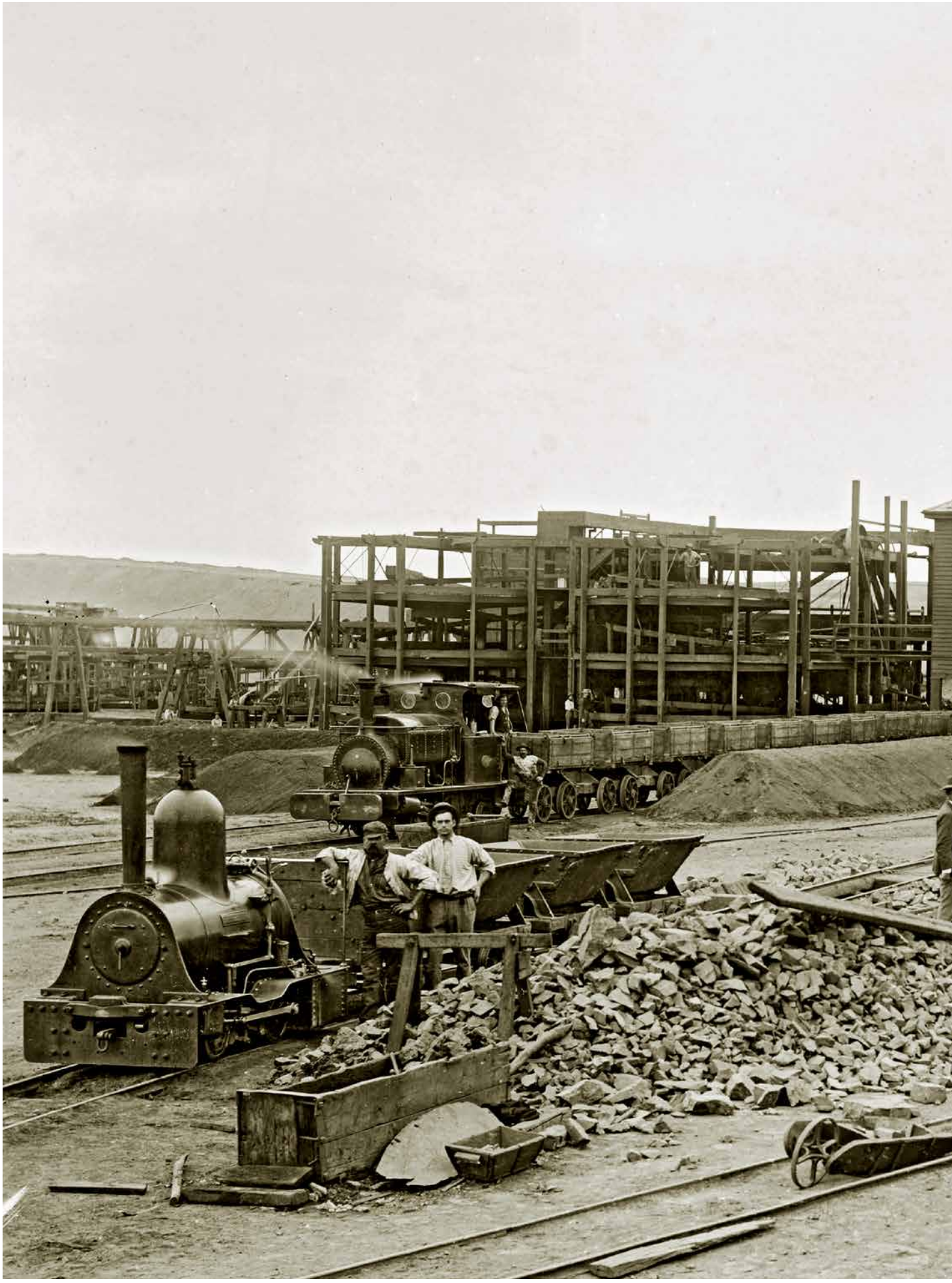


*Beyer Peacock 0-4-0WT B/No.3057 on W R Henry's timber tramway, Forrest, c.1911. Photo: W Henry LRRSA collection*



*Above and centre pages: Beyer Peacock 0-4-0WT B/No.3057 and Hudswell Clarke 0-4-2T B/No. 394 or 550 at Richman's Plant, Moonta SA. Photo: State Records Office South Australia SRSA GRG 35/38 unit 4 no. 84*



*Moreton Mill* Eudlo*, John Fowler 16207 of 1925 at the Bli Bli water tank circa 1940. Driver Edgar Plater with oil can and Fireman Percy Elms. Photo: Hazel Plater (Clive's mum).*

# The Moreton Sugar Mill collection

*by Clive Plater*

A lot of people ask how I became involved in 'collecting trains', so first a little of the family history in relation to the Moreton Mill. My maternal great-grandfather, GL Bury was elected Chairman of the Board of Directors at the Board's first meeting in 1895 and he remained a director until his death in 1925. My grandfathers both worked at the mill, William Bury worked 'inside' operating machinery and Charles Plater was the Bridge Ganger on the tramline. My dad, Edgar, started work at the mill aged 14 and retired after 51 years' service. He worked his way up from loco fireman, during which time he survived a very bad accident, but that is a story for another time. From steam loco driver he was promoted to the office staff in the late 1950s and held positions as Traffic Officer, Assistant Chief Cane Inspector and Tramline Superintendent. With Moreton Mill being a 'small' mill some years he had to fill all three positions. Dad's two younger brothers, Les (Sandy) and Ivan, followed him to the mill. Uncle Les was killed in World War II and one of the mill's Malcolm Moore locos was named '*Sandy*' in his memory. Uncle Ivan drove both steam and diesel locos and was Bridge Ganger during the 'slack season'. Another uncle, Max Lindsay (married to dad's sister) also worked at the mill as Accountant and Company Secretary.

Growing up I spent a lot of time at the mill; I had to so I could spend time with my dad. During the crushing season dad's typical day started at 5.30am, then home for a quick breakfast at about 7.30am, drop me at school then back to the mill. If there were no major derailments or other supply problems he would get home about 5.00pm, tea [dinner] would be at 6.00pm then back to the mill by 7.00pm until 8.30pm. The night session was the time farmers were supposed to ring to sort out any issues instead of ringing staff at home, dad would do five nights per fortnight and the Chief Cane Inspector would do the other five. On top of these hours the phone could ring up to three times during the night with some sort of derailment problem, sometimes it needed dad's attendance or if lucky he could phone a couple of the tramline workmen to attend to it. Typically the mill would finish the week's crushing by lunchtime Saturday. On Saturday morning dad would need to catch-up with the 'River Depot' supervisor either at the depot or at the supervisor's home to work out truck deliveries for the depot's area.

*Moreton Mill* Maroochy*, Hudswell Clarke 1078 of 1914.* Maroochy *derailed in Saints Farm, Bli Bli 1958, a young Clive Plater standing alongside.* Maroochy *had a reputation for ending up on her side. Photo: Hazel Plater*

***Right:*** *Moreton Mill* Moreton, *Clyde 63/289 of 1963, the first diesel delivered to the mill. Driver Ivan Plater and 10 year old Clive Plater in the mill yard 1963. None of the mill's diesels carried names until 1968 by which time there were five diesels and two-way radios were being introduced. Photo: Hazel Plater*

***Below:*** *Ex Moreton Mill* Coolum, *John Fowler 16036 of 1923. Cosmetically restored for her 70th anniversary by Edgar and Clive Plater. Photo: Clive Plater*

Sunday morning meant counting all the empty cane trucks or bins in the mill yard and the marshalling yard at the bottom end of Howard Street. I went with dad most Sundays; he would count the mill yard trucks and start his paper work for the loco drivers starting Sunday night. I would ride my pushbike to the marshalling yard and do the count there, this meant dad got done sooner and he could spend more time at home. On Sunday afternoon we would pick up my grandmother and go for a drive to the beach, which beach was decided by which siding had to be checked for empty cane trucks, I learnt to count quickly as dad drove alongside, particularly on the David Low Way near the Bli Bli Bridge.

Of course in those days common sense prevailed, all the current health and safety rules would not allow kids on pushbikes to wander around mill property or have rides on the locos with your uncle. Nearly every Sunday, Mr Glasgow, the Mill Manager, would wander over to dad's office for an update and he would talk to me about my bike, as he had been a keen cyclist in his younger days. The mill was the lifeblood of the district and it was a big part of our life particularly during the crushing season. One of my other memories is at the start of the season how the noise of the mill would keep you awake for the first couple of nights but after that if it changed its sound. I would wake up and call out to dad, 'the mills broken down' followed by his reply of 'yes I heard it'. A change of sound like a lot of steam blowing off would potentially

mean a problem for dad the next morning. A lengthy breakdown in the mill would mean not enough empty trucks for morning deliveries. This was not such a problem with hand cutting, as the cane cutters could commence work cutting and load the trucks when the loco delivered them, but with mechanical chopper harvesting the bins had to be there before cutting could start.

Now to the collection itself, it started with dad purchasing the *Coolum* steam loco from the mill in 1972. At the time we did not have a big enough property to house it but Bill Taylor, owner of Sunshine Plantation had expressed a desire to have an historic steam loco on display at the Big Pineapple. We became involved with the Taylor family from the start of their project; I surveyed the layout for the tramline with dad and the mill's tramline gang building the track on weekends. So with a 'hand shake agreement' for Sunshine Plantation to cover insurance and cosmetic maintenance, *Coolum* was moved to the Big Pineapple where it remained until 1991.

By the time dad retired from the mill in 1981 most of the locos had found their way into local parks or some sort of museum but none of the 'unglamorous' rolling stock seemed interesting to anyone so we started collecting it from the mill's junk pile and whenever they were scrapping something they would ring dad to see if we were interested. Our aim was to collect or rebuild at least one example of the various trucks/wagons that the mill used. Dad remained the mill's honorary historian up until the mill closed in December 2003.

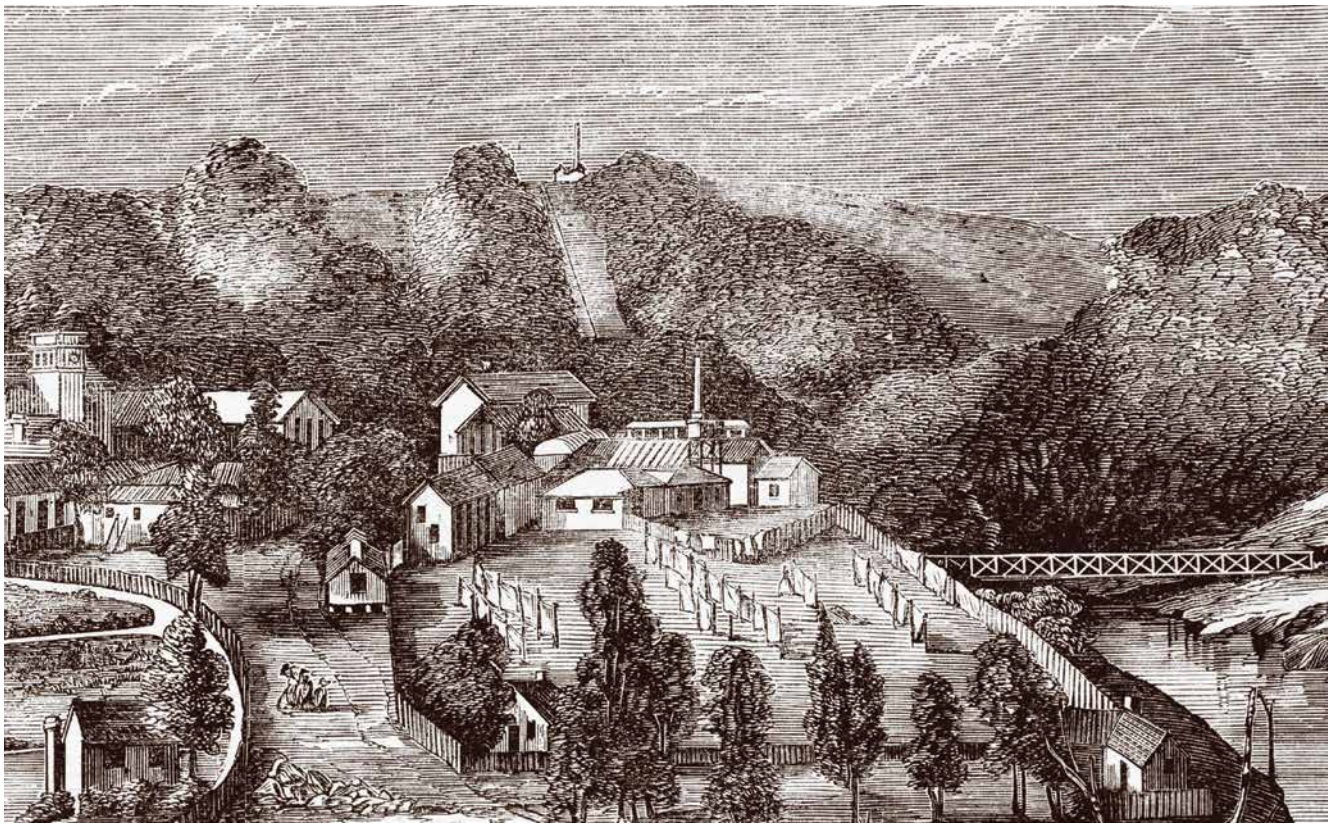
In 1981 we still did not have a property to house the growing collection but I worked for the Sunshine Coast's largest earthmoving company at the time so I could store things at the company's depot plus I had access to crane trucks and a low loader for transport. In 1989 I purchased a 10 acre property at Eudlo, our first 'shed' was in fact the old Moreton Mill Bridge Gang carriage which was originally used on the Nambour to Mapleton Tramline. We used it to store tools and cement until we built our first small shed then came a large purpose built shed which had to not only house our tramline collection but be multipurpose with garages for a growing car collection and a family party room. We also intended to live in it for a period until we could build our house.

Central in the shed's design was to incorporate two ex-Queensland Rail Guards Vans (these formed the walls of our party room), space for eight vehicles, workshop and 30 metres of undercover tramline. The railway guards vans were positioned and the shed built around them, '*Coolum*' was brought home in 1991 and by this time needed quite a lot of cosmetic restoration that was completed by 1993. As well as the rolling stock we had been accumulating from the mill I had purchased a 1954 Ruston diesel from Sunshine Plantation. This was the first loco used there and was set-aside with a blown engine; I re-engined it to act as our shunter and named it *Nambour*. The Ruston was our only operational loco until I purchased EM Baldwin *Maroochy* from the mill in 2004. We have approximately 200 metres of operational track plus a reserve supply of rail and sleepers.

Our collection is as follows;

- Steam Locomotive *Coolum*, John Fowler 16036 of 1923
- Diesel locomotive *Nambour* Ruston DLU 30, 371386 of 1954
- Diesel locomotive *Maroochy* EM Baldwin 1064 of 1964
- Petrol locomotive *Flyer* [a long term project]
- Bridge Gang carriage
- Tender from steam locomotive Moreton
- 6 whole stick cane trucks
- 1 whole stick cane truck [A type, circa 1900]
- 1 cane bin
- 1 ballast wagon
- 2 tipping ballast wagons
- 3 flat top wagons loaded with tools and winches
- 2 bolster bogies loaded with 'portable rail'
- 1 bogie passenger carriage [our design and build]
- Cabin from diesel locomotive *Innisfail* EE Baguley
- Numerous spare parts.


*Ex Moreton Mill,* Maroochy*, E M Baldwin 1064 of 1964. Purchased by Tender in 2004 following the mill's closure in 2003. 'MAROOCHY' is still pretty much in its 'work clothes' condition that it left the mill in, a broken window replaced, seats re-upholstered and the headlights moved from the roof to give clearance in Clive's shed.* *Photo: Clive Plater*



*The incline and engine house at Kew are visible behind the buildings of the Yarra Bend Asylum in this portion of an engraving by Frederick Grosse published in the* Illustrated Australian News *in May 1868. The footbridge over the Yarra from Studley Park, seen on the right, was closed in 1885 and destroyed in 1891.* *State Library Victoria image IAN23/05/68/12*

# Kew Mental Hospital Construction Tramway

*by Colin Harvey*

During the early years of the Port Phillip District of New South Wales the only local accommodation for the insane was in prisons. In 1846 government funds were provided for the erection of an insane asylum near the junction of the Merri Creek with the Yarra River five kilometres north-west of Melbourne town.[1] The 'Yarra Bend' asylum site was effectively a gently sloping peninsula, enclosed by the meandering course of the river and the creek, formed by ancient flows of basaltic lava that forced the Yarra's channel against the higher, but softer, Silurian rock to the south and east.[2]

The first wing of the asylum opened in 1848 with accommodation for 25 patients[3] but almost immediately required expansion to meet the demands of Victoria's gold-rush-induced population increase. In less than ten years the number of patients had exceeded 300 and calls were being made for a large-scale replacement establishment on a new site which would 'conduce to the happiness and comfort of the patients, and facilitate their recovery'.[4]

Following recommendations by a board appointed in 1854, Government Architect George Vivian produced a design for a new asylum, based on the latest British practice, with provision for 418 patients. The site proposed was across the Yarra from the existing asylum on high ground to the north of the village of Kew where 'during the summer months the refreshing influence of the sea breeze will be felt'. It was intended to construct the main building with bluestone basements and brick superstructure; the bricks to be made on the site. Vivian recommended a first contract be let for building two lodges (initially to house the construction supervisors) and entrance gateways, followed by separate contracts for bricks, foundations, building erection and fittings.[5]

In 1857 the Government let contracts for the construction of the two lodges and for the supply of eight million bricks.[6] The following year the Legislative Assembly confirmed the recommendation of a select committee to continue with the relocation of the Yarra Bend asylum to Kew but funds were not immediately made available for further work–allegedly due to the influence of aggrieved property owners of that locality.[7] In the meantime the existing asylum, now home to about 600 patients,[8] was expanded by the construction of additional cottages using bricks that had been manufactured at Kew. Transporting the bricks across the river required the purchase of a punt and construction of a road to the river bank.[9]

Yet another inquiry, by the Victorian Lunatic Commission in 1863, unanimously recommended the closure of the Yarra Bend Asylum in favour of a new 500-bed asylum at Kew plus two district asylums, at Ararat and Beechworth, with a capacity of 250 patients each.[10] This time funds were made available.

## New Asylum Design

The design for the Kew buildings was revised by Public Works Department (PWD) architect Frederick Kawarau and the site changed to a more elevated location, south from that originally proposed by Vivian. The final design, of Italianate and French Second Empire style, provided accommodation for 540 patients in 22 wards and 240 single rooms. The buildings were laid out in the form of an 'E' with an 805-feet-long three-story administrative block at the front, the two-story women's division projecting 600 feet to the rear on the left and the male division similarly on the right.

The central arm included recreation rooms, the dining room and kitchens. Towers, 108 feet high and largely ornamental, were arranged at each intersection of the administrative and patient blocks. The upper part of these towers housed water tanks containing captured rainwater. (Rainwater was considered more potable than the 'Yan Yean' supply, the latter being used for washing.)[11]

Construction material was cement-rendered brick walls above stone foundations and basement stores with timber flooring. The whole complex was surrounded by a rectangular brick ha-ha wall of 1000 feet frontage and 827 feet at the sides.

## First Contract

The contract to construct the main buildings at the Hospital for the Insane, as it was now known, was let to John Young in September 1864 at a price of £108,860.[12] Young was a very experienced contractor who had successfully executed works for the Victorian Government and also St Patricks Cathedral, Melbourne, which had been designed by W W Wardell, the Inspector-General of Public Works. (Young had previously constructed a number of other Wardell-designed buildings including churches in England and St Marys Cathedral, Hobart. He would later undertake St Mary's Cathedral in Sydney, also designed by Wardell.)

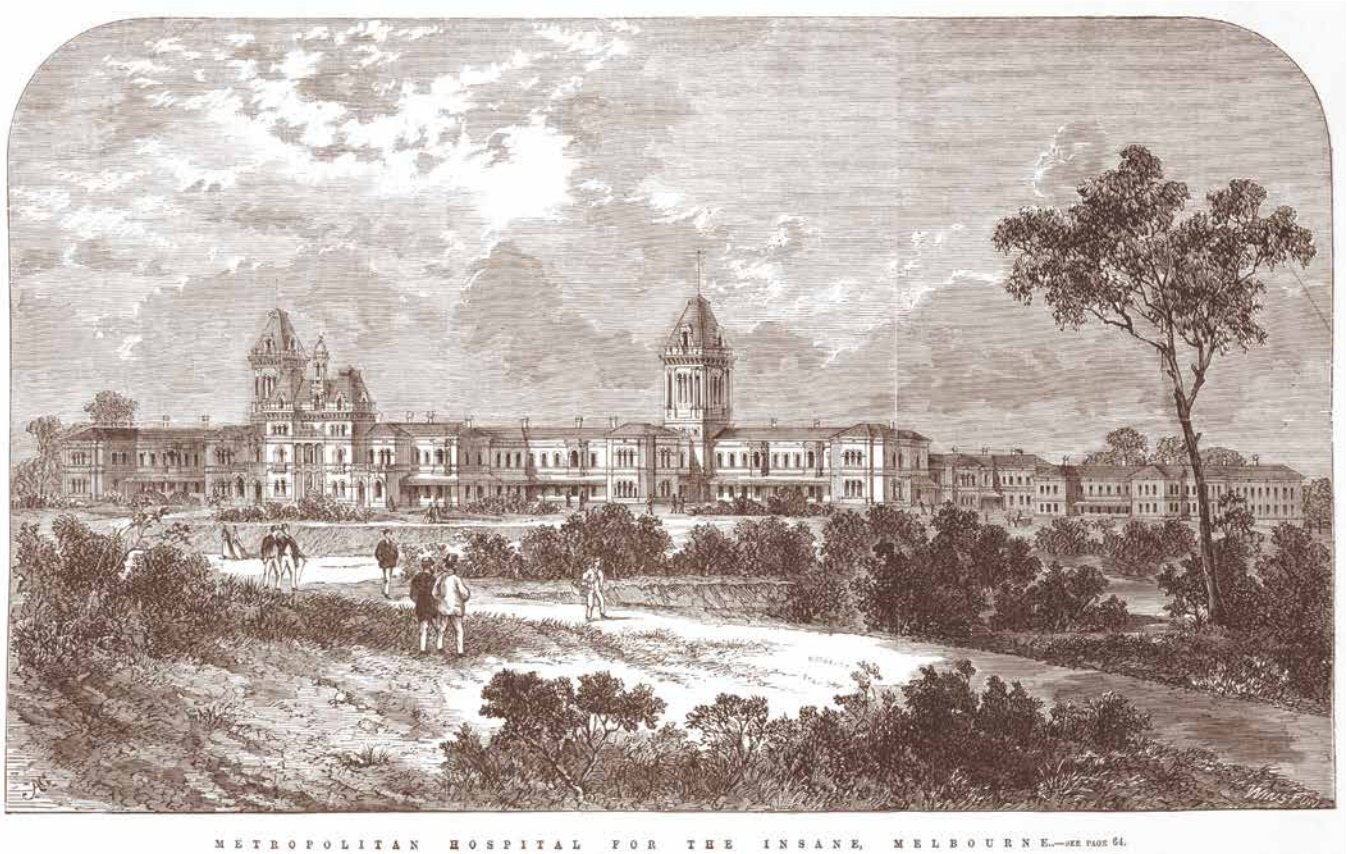
The relative isolation of the Kew site from the then-populated suburbs of Melbourne meant that the large workforce required was permitted to reside on the site in a collection of tents, huts and boarding houses.[13] To manufacture the six million bricks required, clay pits were established at the southern end of the site, along with six pug mills and four wood-fired kilns, the latter requiring an estimated 9000 tons of firewood. However, no suitable stone was available on the Kew side of the river.

The lack of readily accessible stone had been recognised when the contract was being drawn up. The closest existing bluestone quarry sites were at the north end of the Yarra Bend Asylum reserve so the contract conditions stated that 'should the contractor decide on using these quarries he will have to keep the roads or tracks…from same across the reserve to the place where he intends crossing the river in proper repair and only a width of 40 ft will be allowed for such roads or tracks outside of which no traffic will be permitted.' In addition 'the contractor will have permission to construct a bridge across the Yarra for the purpose of transporting the material…such bridge to be constructed in such a manner as not to interfere with the free passage of the water in cases of floods.'[14]

## Tramway

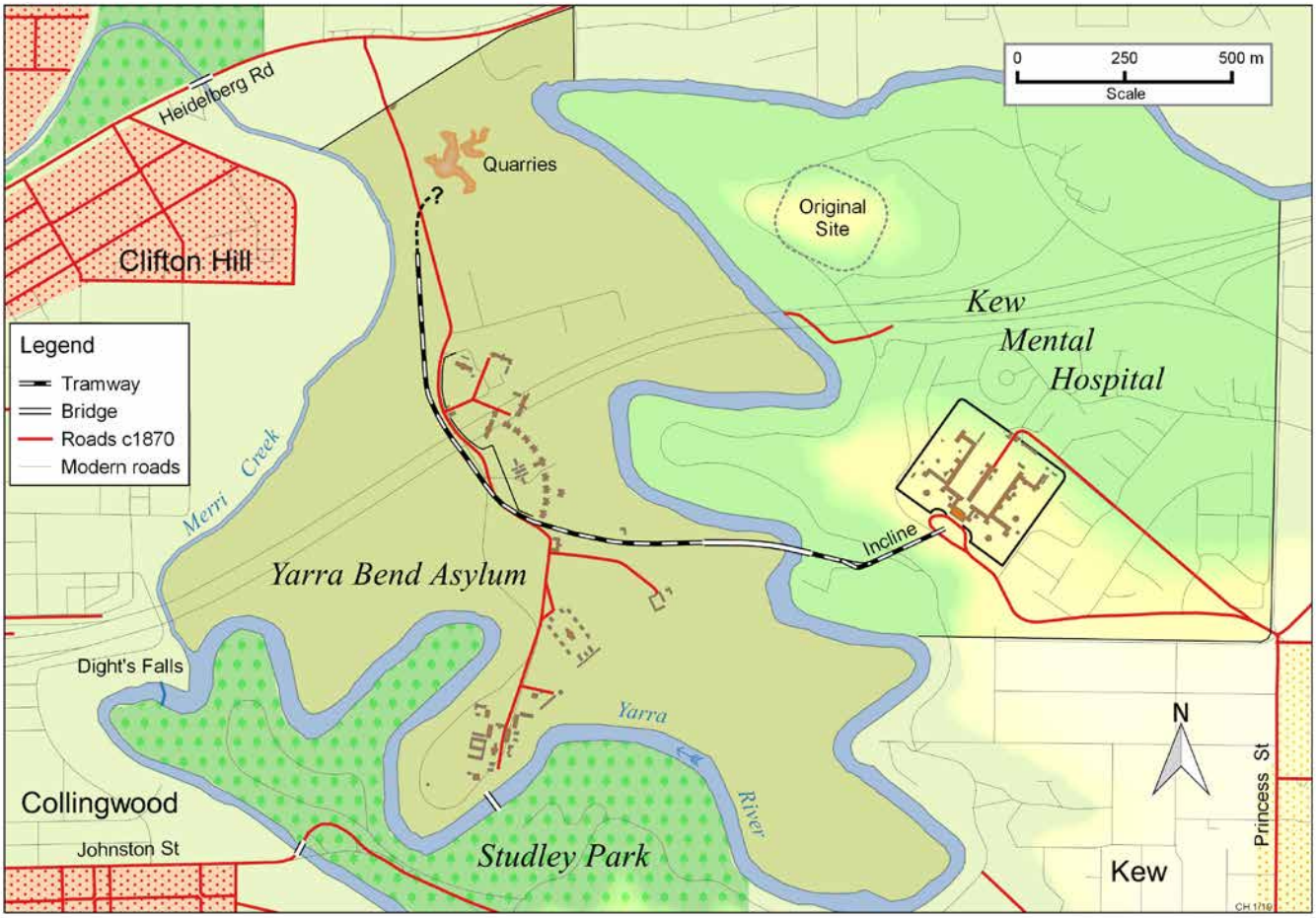
The contractor effectively had three options for transporting stone: a long road journey using existing bridges (mainly tolled), a short road or tramway journey with a punt across the river, or the short journey with a new bridge. Young asked if the Government had any requirement for a permanent bridge between the Yarra Bend Asylum and Kew Hospital—a financial contribution from this source would have made the decision easy—but the reply was that 'there is no probability of the Yarra Bend Reserve being permitted to continue for the purposes of the Lunatic Asylum and that therefore as there is no occasion for permanent communication across the river'. (As it turned out, the Yarra Bend Asylum was to remain open for the next 61 years!) The Commissioner of Public Works did, however, agree that any bridge and other plant provided by the contractor would be compulsorily purchased by any subsequent contractor at PWD valuation.[15]

By November 1864, Young had apparently decided that a tramway and bridge was the best solution having taken into



METROPOLITAN HOSPITAL FOR THE INSANE, MELBOURNE.—SEE PAGE 64.

*This engraving was published in the* Illustrated Australian News *in March 1869, based on the work of architectural draughtsman A C Cooke, shows the building as designed. At this date construction under the second contract had just recommenced. The incline engine would have been sited immediately outside the main entrance.* *State Library Victoria image IAN01/03/69/53*




consideration that any materials from Melbourne could also be delivered this way avoiding a more expensive road trip through Kew. He then approached the Victorian Railways to rent 'certain rails'. The Railway was not prepared to rent the rails but was prepared to sell. It seems that this offer was not taken up but several miles of second-hand rails of various weights were obtained as a 'job lot' from elsewhere, possibly from the Cornish & Bruce partnership, the main contractor for building the Footscray to Bendigo railway, which was then disposing of plant.[16]

The next decision was what sort of bridge to construct. Even though the contract gave authority to bridge the river, the Inspector-General objected to any bridge that required piles in the waterway. This objection may have been influenced by major floods in 1861 and 1863 that destroyed many bridges in Victoria. Young rose to the challenge and decided to construct not only a bridge that had a clear span across the waterway, but a high-level bridge with the spans clear of the recent flood level.[17]

The design that emerged was an approach viaduct, about 180 metres in length, with driven timber piles of gradually increasing height on the Yarra Bend side of the river leading to the single span across the river, followed by a short length of bridge reaching the higher ground on the Kew side. The main span appears to have been a pair of Howe trusses, constructed from 978 cubic feet of North American softwood (Oregon) supported at each end on square piers of four 70-feet-long piles of Mount Macedon hardwood, giving a clear span of 130 feet. On the main span the tramway was carried on a timber deck, about 3.6 metres wide, mounted on the top chords 17 metres above the normal river level. In total the bridge and viaduct was some 238 metres in length. Construction of the bridge was superintended by Young's foreman carpenter, John Stubbs.[18]

The use of an American bridge design at this date is very unusual, however a Howe-truss bridge, also constructed with North American softwood, had been in use from 1854 carrying the Mount Alexander Road across the Maribyrnong River at Keilor. Although the road bridge was of the 'through' type rather than a 'deck' truss, the ability to obtain a similar clear span, 135 feet in that case, may well have inspired the design for Kew.[19]

The tramway was graded to allow loaded trucks to be run mainly by gravity from the quarries (of which there were three) to the Kew side of the river. From here a cable haulage, powered by a horizontal steam engine, raised them about 30 metres to the level of the building works. The winding engine also served to pump water for the works. The total length of the tramway was at various times stated to be 'about one and three quarter miles', 'almost two miles' and, more precisely, 127 chains of single line. It seems that there were initially 11 wagons available.[20] No source has been found that mentions the gauge but the width of the bridge deck suggests that it may have been 5 ft 3 in.

## Trouble at the works

Construction work on the hospital was well underway by June 1865, with foundations being installed and brick production in progress, when questions were raised in the Victorian Parliament as to the quality of the work. A committee of building experts was quickly convened to assess the veracity of the claims.

Within a week, the committee reported that the footings and foundation walls had not been constructed in accordance with the specifications, but the quality of the materials was generally satisfactory. The problems seem to have resulted from a lack of competence on the part of Young's foreman. Three PWD foremen of works, who were supervising work on the ground,

and the Clerk of Works, the building's architect Frederick Kawerau, were immediately suspended.[21] Two 'competent and undoubtedly trustworthy men', Peter Findlay and George Paterson, were then seconded from the Victorian Railways to take charge of the hospital buildings and the materials and plant on site.[22]

The Inspector-General of Public Works recommended that all the defective work be redone by the contractor at the latter's cost (estimated to be £400 to £450). The alternative was to cancel and readvertise the contract. At that time progress payments of £10,708 had been made. In addition to the contract deposit, the Government could have, if there had been a breach of contract, seized the material and plant, including the tramway, viaduct and rolling stock (in total estimated to be worth £10,689) so there was little risk in allowing the contractor to remediate the problems. However the Government, through the Board of Land and Works, chose to cancel the contract.[23]

The Government proposed acquiring the works, material and plant on site for use in a future contract by paying Young its value, less progress payments already made. Young was understandably not at all happy with this arrangement nor with the determination of the government-appointed valuers, the aforesaid Messrs Findlay and Paterson in conjunction with William Findlay (the brother of Peter Findlay and soon to be transferred from the Railway Department to the PWD). In addition to his written objections to the lack of independence in the valuation, a pile of rejected bricks mysteriously appeared outside the PWD's Melbourne offices![24]

Young submitted a very different valuation prepared by civil engineers, timber merchants and brick makers. Pending settlement of the dispute, the Minister of Public Works approved return of the contractor's deposit and payment of the government valuation of £4881.[25] Young then commenced legal proceedings which, in June 1865, resulted in the matter going to a panel of three arbitrators for resolution. The arbitrators held hearings over the next four months with arguments ranging over matters such as whether the contractor was entitled to payment for loss of potential profit due to the cancellation of the contract; what variations to the specification had been authorised; the costs, quantities and quality of materials used; whether the construction of the tramway and bridge was a necessary expense; and if the bridge was of value to the Government in connecting the Yarra Bend Asylum with the hospital.

Young was represented at the hearings by polymath Professor Hearn of the University of Melbourne and was able to provide an impressive set of witnesses to dispute the government valuations including eminent engineers Alexander K Smith (the engineer responsible for erecting the Melbourne gas works), for mechanical plant, and Henry Mais (Engineer and General Manager of the Melbourne Railway Company) for the tramway and bridge.[26]

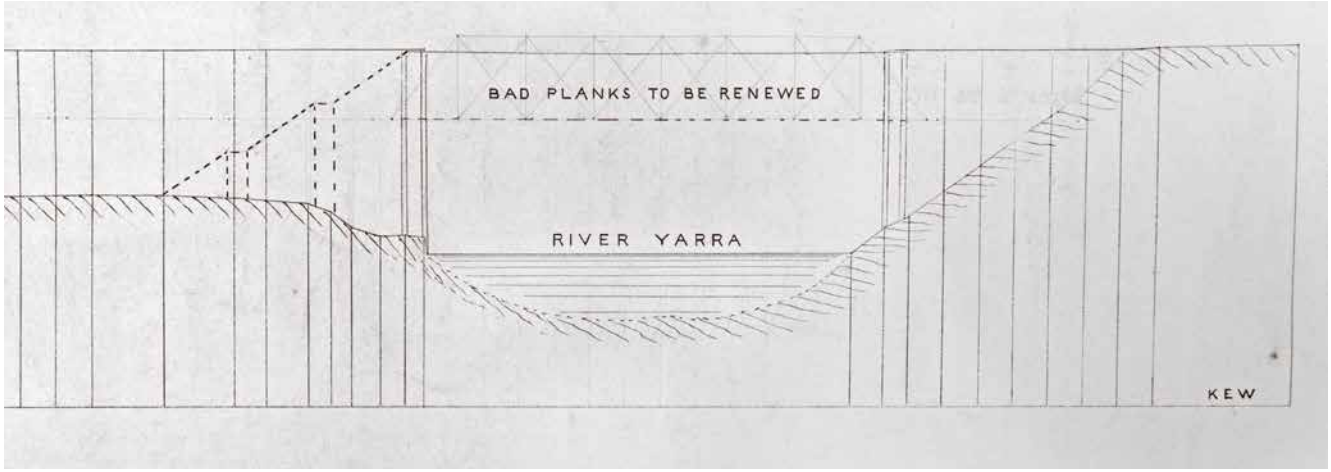
William Findlay told the arbitrators that in total about 9263 cart loads, equivalent to 3088 tramway trucks, of cut and rubble stone were required. Up to 18 truck loads per day had been moved over the bridge, which he described as a rough and temporary structure with the rails in the tramway on the quarry side being a mixture of all sorts, all of different characters, different sizes and different lengths. In Findlay's opinion it would have been much cheaper to have used punts rather than incur a large expenditure (about £5800 according to Young) on a tramway and bridge; the saving turning a potential loss into a profit.[27]

On 19 November 1866 the arbitrators found for the plaintiff, awarding Young £7201 damages for loss of profit from the contract being unreasonably cancelled, £450 for work done and £3226 for material on the site.[28] Together with legal costs this was a very expensive result for the Government resulting from the decision to cancel the contract that, it was suggested, may have been influenced by vested interests in the building trade. At this time Young moved his business to Sydney where he then had a highly successful career in the building industry and local government, becoming Mayor of Sydney in 1886. A subsequent parliamentary select committee found that the decision to cancel the contract was justified—but the chairman of that committee, Edward Cope, was a disgruntled potential supplier of materials to Young.[29]

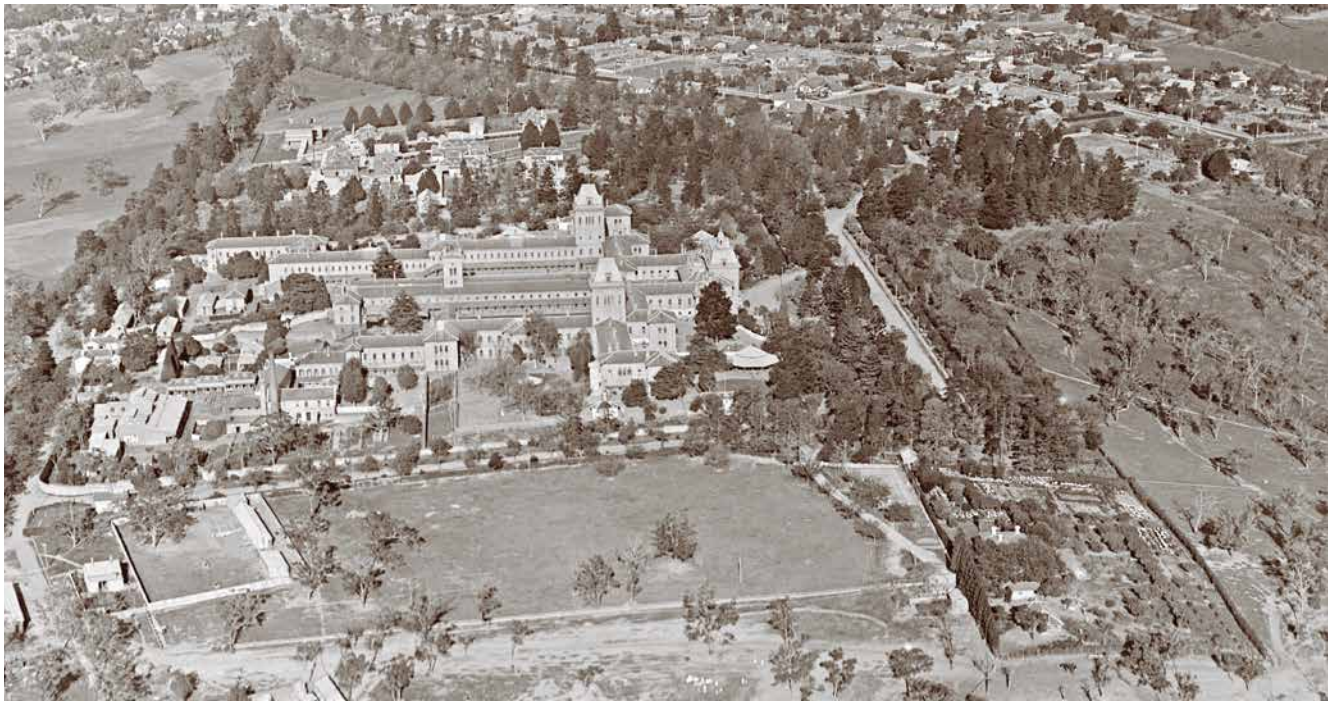
## Second contract

Twenty-two months elapsed from the time work had ceased before tenders were called to continue the erection of the hospital. Tenderers were required to allow £15,000 for acquisition of the materials and plant already on the site: probably including the tramway but excluding the bridge. The successful tender was £110,414[30] by Melbourne City Councillor Samuel Amess; builder of the Treasury building, the Ballarat railway station and some of the Melbourne post office. Work resumed in November 1868.

One of the first actions by the new contractor was to arrange to pipe 'Yan Yean' water from the Yarra Bend Asylum over the tramway bridge. During the construction hiatus the bridge had remained an important informal convenience for pedestrians despite, until the resumption of tramway traffic,




*Part of the section of the tramway bridge and viaduct from Public Works Department Plan B TB 682 of 1881 showing the conversion for pedestrian use by replacing the viaduct with a set of stairs. Source: VPRS 3686/P5, Unit 1021.*



*The scale of the hospital buildings is evident in this aerial photograph taken before the construction of the Yarra Boulevard in the early 1930s. The view is towards the south east and the footpath that lead to the Zig Zag Bridge is visible on the right.*

*State Library Victoria, Airspy collection, part of image H91.160/1708*

lacking the security of any railings. Amess had previously testified that he 'would not care about using it, unless it was better stayed' and was 'rather afraid to put much weight upon it' being 'rather astonished to see how it kept up'. Nevertheless he returned the bridge to tramway use.[31]

As well as the stone tramway, light railways were used within the brickworks and across the site generally. A year after the contract was accepted, a reporter for the Weekly Times described the brickworks thus:

> …a pit of clay of excellent quality has been opened within a couple of hundred yards of the building, and on a rising ground immediately above it a second steam-engine has been erected, with a tramway descending at an abrupt slope from it into the pit. The latter is nearly circular, and in its centre there is a turn-table with lines of tramway radiating from it. These tramways are traversed by trucks or "lorries," each estimated to contain, when loaded, the material of 400 bricks. The truck is filled by labourers working with picks and shovels, and is wheeled to the turn-table, and made to face up the incline towards the steam-engine. The engine is then attached to it by means of rope and hook, and it is drawn up the sloping rails. On arriving at a certain point, a piece of self-acting mechanism causes the bottom to fall outwards on a hinge. The truck is then released from the steam-engine, and descends by its own weight back into the pit. The clay drops between iron rollers into a "pug-mill," where it is chopped up by a number of knives, and reduced to an uniform consistency. Thence it is again transferred to a truck and handed over to a brickmaker, who moulds and stacks it in tiers for the purpose of being dried by atmospheric action. It is then, after a proper interval, transferred to a burning kiln, of which there are three, each containing 150,000 bricks. These are so worked that whilst one is burning, another is being filled and the third is being emptied. When the burning process is completed, the bricks are put upon another truck traversing a tramway, which runs past the kilns, and by that means is conveyed close up to the building.[32]

The following year the *Leader*'s reporter was also impressed:

> Tracing your way round to the rear, you again encounter the apparently interminable tramways running in all directions, with every here and there a turntable of primitive construction. … before you have completed your journey to the rear you will probably have to beat a precipitous retreat before a truck loaded with bricks or mortar, which you will be sure to encounter… No one…who sees how completely this system has been, carried out on this work, will doubt for an instant the immense economy of energy which has been effected.[33]

To operate the equipment at least two engine drivers, Henry May and Charles Porter, were among the large number of tradesmen resident on the site.[34]

By the early 1871 construction of the main hospital buildings was almost complete. Among the 'extras' paid to Amess at the conclusion of the contract were sums for maintaining the bridge and approaches and for filling in all the excavations made for brickmaking.[35] The significant contract for the brick boundary wall was let to Messrs Walker and Halliday in January 1872 at a price of £23,263. These contractors were also obliged to pay Amess £3725 10s for some of the remaining plant even though it seems Amess was not contractually entitled to reimbursement and much the plant was of limited use for building a wall. Over the next eighteen months the brick plant, winding gear and tramway rails were progressively sold; some of the rails going to the Yan Yean aqueduct construction tramway.[36]

Fitting out the buildings continued for some time, under other contracts, with sections being progressively handed over to the Inspector of Lunatic Asylums from December 1871. Over the next two years, existing patients were transferred from the extremely overcrowded Yarra Bend Asylum.* From October 1873 new admissions went to Kew.[37]

## Later use of the tramway bridge

After the opening of the Kew hospital the use of the former tramway bridge by pedestrians became more important with staff shared between the two institutions and some resident in Collingwood. A gate was provided at the Kew end of the bridge

*At this time Yarra Bend had over 1000 patients and was the eighth largest asylum in the world. (Bonwick, p.46)

*Zig Zag Bridge viewed from upstream. The central pier and substructure was removed in 1910 and replaced with a single span similar to those near the banks.* *State Library Victoria image H83.94/416*

to prevent its use by the general public. Despite the existence of some sort of handrail, in 1880 a female hospital attendant died, in unclear circumstances, by falling from the bridge.[38]

The water pipe over the bridge from Yarra Bend to Kew was not needed after the completion of the nearby Fairfield pipe bridge in 1879. Twice in the following year the PWD unsuccessfully called tenders for the purchase and removal of the western approach viaduct. It was then decided to dismantle the approach viaduct, recover any usable timber (using the balance for firewood) and replace it with a set of stairs leading to the main bridge span. This work was carried out by contractor J Hutcheon during 1881.[39]

By 1886 it was recognised that deterioration of the bridge would make replacement inevitable. A longer route *via* a pedestrian bridge between the Kew Asylum and Studley Park had been closed the previous year when that bridge was declared unsafe. Until funds for replacement could be made available, a new four-feet-wide gangway was laid on top of the old deck of the tramway bridge. Construction of a new bridge became essential when the 'Great Flood' of July 1891 severely damaged the old structure.[40]

## Subsequent events

A replacement bridge was designed by the PWD and erected by contractors Duffy and Rankin early in 1892. Although in the same location as the tramway bridge, the design was very different and somewhat peculiar. A low-level gangway on the west bank led to three flights of stairs within a six-pile rectangular pier. The river was bridged by four wooden spans (modified to three spans in 1910) of up to 45 feet each, strengthened with iron tie rods and supported on broad four-pile piers within the stream. On the east bank there was a four-pile rectangular pier without internal stairs. Although the river spans were set high enough to be clear of the 1891 flood level, the deck height was about six metres lower than its predecessor necessitating a further flight of stairs to the top of the east bank.[41] The multiple flights of stairs and changes of direction resulted in the epithet "Zig Zag Bridge".

The Zig Zag bridge served until 1923 when it was in turn swept away in a flood.[42] By this time the Yarra Bend Hospital (renamed from 'asylum' in 1905) was in the process of being closed so the hospital authorities had no need for the bridge to be replaced.

The Yarra Bend Asylum site became the Yarra Bend National Park in 1926. A suspension bridge, known as Kane's Bridge, to allow access to the park for pedestrians from Kew and Studley Park, opened in 1929. This bridge was 2.5 km downstream from the site of the Zig Zag bridge.[43] The 1934 flood removed the original Kane's Bridge and it was replaced the following year by a similar structure which still survives.

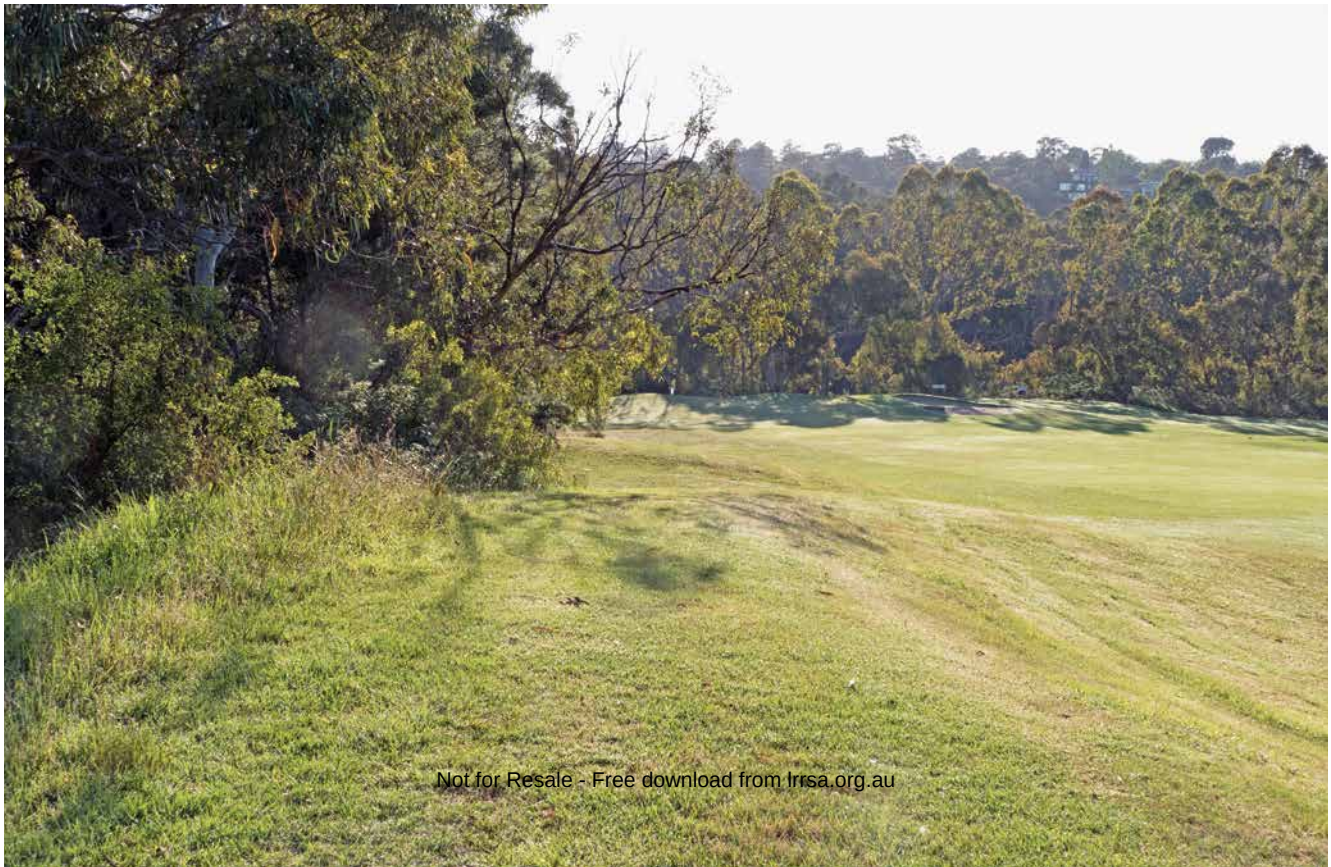
The Kew hospital, renamed Willsmere Psychiatric Hospital in 1960, continued in operation, in various forms, until 1988. The original buildings have since been refurbished to form part of a gated community of high-class apartments.⋆ The site of the bluestone quarries became the Fairfield Infectious Diseases Hospital and is now part of the Melbourne Polytechnic.

⋆ For further details of the Willsmere conversion, including recent photographs, see the web page https://www.willsmere.net

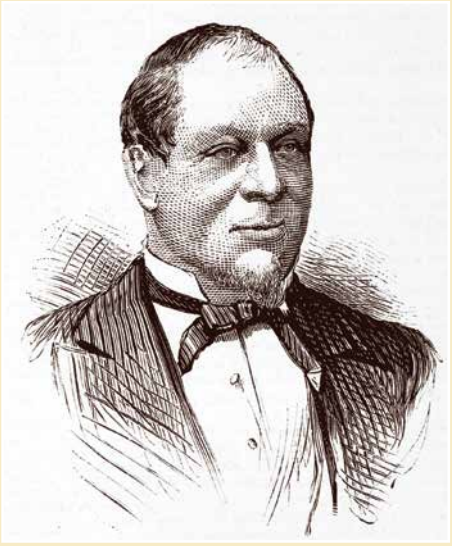

***Above:*** *A view along the path used by staff at the Kew Hospital from the embankment at the west abutment of the tramway bridge looking towards Zig Zag Bridge sometime before the 1910 modifications. State Library Victoria image H90.160/762*

***Below:*** *From the same location as previous image early on Christmas morning 2018; now an 8-iron shot to the 13th green. The trees have grown blocking the view to the Kew Asylum but provide habitat for a colony of Grey-headed Flying Foxes. Photo: Colin Harvey*

***Right:*** *This image of the rear of the centre block at Willsmere, photographed in 2017, shows the massive bluestone cellars. Photo: Colin Harvey*



Landscaping, construction of roads and repurposing of the sites have removed almost all trace of the tramway. The most noticeable extant feature is the embankment at the west abutment of the viaduct that can be found on the north side of the thirteenth fairway of the Yarra Bend golf course.



## John Young

John Young was born in 1827 at Foot's Cray, county of Kent, England. At an early age he assisted with the construction of Goole Docks and other works for the Aire and Calder Navigation Company and the Wakefield, Pontefract and Goole railway. Before the age of 20 he had designed and superintended the construction of stations for the Lancashire and Yorkshire Railway Company.

After experience superintending a contractor's business he was for two years draughtsman under Sir Joseph Paxton, during which time he made drawings for the 1851 Exhibition. After leaving Paxton, Young commenced business as contractor in his own right, constructing houses, schools and churches including that at Chislehurst, Kent, where the former French Emperor Napoleon III was buried.

In 1855 he came to Melbourne and constructed St. Patrick's Cathedral, Ballarat Gaol, and many churches and villas around Melbourne.

After moving to Sydney in 1866 he constructed St. Mary's Cathedral, the first stage of the General Post Office, the Exhibition buildings of 1870 and 1879 (the latter the famed Garden Palace) and numerous other public and private works. An alderman of Sydney for many years, he served as mayor in 1866 then as councillor and mayor of several suburban councils. Young is also remembered for promoting lawn bowling in New South Wales. He died in in1907.[44]

***Above:*** *John Young pictured in the* Illustrated Australian News *in October 1879 as constructor of the Garden Palace for the Sydney International Exhibition buildings. State Library Victoria image IAN31/10/79/173*


### Acknowledgements

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# Industrial Railway NEWS

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**Special thanks to contributors to the *Sugar Cane Trains/Navvy Pics 2ft* Facebook page.**

## QUEENSLAND

### BRADKEN, Boogan

610 mm gauge

Output from this cane bin manufacturer near Innisfail seen on 4 May, were new 6 tonne bins and old 6 tonne bins fitted with new frames. These were probably for Mulgrave and/or South Johnstone Mills.

Editor 5/19

### BUNDABERG SUGAR LTD, Millaquin Mill

(see LR 263 p.27)

610 mm gauge

Bundaberg Sugar's Plasser KMX-12T tamping machine (390 of 1994) was working at Crossets Hill on 24 April.

Luke Horniblow 4/19

### DOWNER EDI, Maryborough

(see LR 267 p.25)

1067 mm gauge

Walkers B-B DH 1104 (641 of 1970) has been purchased from ARHS Loco Shed NQ. It has been stored at UGL, at Bohle, Townsville since being acquired from Curtain Brothers, Townsville in August 2015. 1104 was seen in transit at Alligator Creek, south of Townsville and Proserpine on 15 April, at Mt. Christian, south of Mackay on 16 April and at Gin Gin on 17 April. It is expected to be back up to the work's shunter, Walkers B-B DH DH73 *Hugh Boge* (718 of 1974), which was seen on duty during May.

Luke Horniblow 4/19; Rob Stanier 4/19; Pappa Nambu 4/19; Bryan Condon 4/19; Stephen Cantwell 5/19; Ronda Stewart 5/19

### ISIS CENTRAL SUGAR MILL CO LTD

(see LR 267 p.25)

610 mm gauge

Walkers B-B DH 4 (656 of 1970 rebuilt Walkers 1994) was seen with the poison train on Mamminos line on 2 May. Walkers B-B DH 5 (617 of 1969 rebuilt Isis Mill 1998) was repainted in the mill's all over yellow livery during the slack season. It is the last of the Walkers locos to be painted in this livery. Its bogie brake wagon 5, built by the mill in 1999 using an ex QR wagon, was also repainted in the all over yellow livery. Clyde 0-6-0DH 9 (75-812 of 1975) and EM Baldwin rodded 6 wheeled brake wagons 9 (10278.1 5.82 of 1982) and 10 (7937.2 7.78 of 1978) had been moved outside the shed where they were stored by 2 June. 9 still runs and moves under its own power after many years of storage.

Brian Bouchardt 5/19; Ben Glossop 6/19


*Mackay Sugar's EM Baldwin B-B DH* Foulden *(7220.1 6.77 of 1977) with a ballast train at Post Office Loop on the Teemburra line on 8 May. Photo: Mitch Zunker*


*Walkers B-B DH 1104 (641 of 1969) at Alligator Creek just south of Townsville, on its way to Downer EDI, Maryborough on 15 April. Photo: Luke Horniblow*

**MACKAY SUGAR LTD, Mackay mills**
(see LR 267 p.25)
610 mm gauge
Tamper resleepering machine RSLEP6 (599 of 1988) was seen at Ossa 11 on the north coast line on 19 April. On 10 April, the new loco shed at Racecourse Mill was externally complete. Also, the last section of trackage on the connecting link between Racecourse Mill and Farleigh Mill's Palms line was being laid. EM Baldwin B-B DH Inverness (10123.1 5.82 of 1982) was being used to run ballast on this line on 3 May and on 20 May, work was almost completed. This new line appears to have been named the Te Kowai line.
Editor 4/19; Luke Horniblow 4/19; Mitch Zunker 5/19

**MSF SUGAR LTD, Mulgrave Mill**
(see LR 267 p.26)
610 mm gauge
The Ross and Locke bridge over the Mulgrave River on the Little Mulgrave line appears to have been another declared unfit for locos last year. On 26 October, Clyde 0-6-0DH 25 *Cucania* (63-289 of 1963) was being used to work the line beyond this bridge and was interchanging loads with locos from the mill. This slack season, the existing piers on the Mulgrave River bridge near the mill have been replaced or encased, making them stronger and larger concrete structures with a large concrete footing. The steel bracing has been removed from them. Around 24 April, a land slip at the side of the Cairns Western Arterial Road near the top of the Brinsmead Gap impinged onto the Redlynch line below causing the track to lift and slew to one side. Com-Eng 0-6-0DH 6 (A1006 of 1955) was seen on ballasting duties again on 1 June, this time near Aloomba. It was coupled to one of the ex Hambledon Mill hoppers with another nearby. Com-Eng 0-6-0DH 26 *Meringa* (AK3675 of 1964) was in attendance at the bin repair shop on 27 May.
Gregorio Bortolussi 10/18, 5/19, 6/19; Department of Transport and Main Roads (Queensland) 4/19

**MSF SUGAR LTD, South Johnstone Mill**
(see LR 265 p.25)
610 mm gauge
Com-Eng 0-6-0DM 28 (AA1544 of 1960) was seen stored in the navvy compound on 5 May. It is quietly breaking down into a pile of rust.
Editor 5/19

**TULLY SUGAR LTD**
(see LR 264 p.27)
610 mm gauge
A small number of new bogie bins were seen at the mill on 5 May.
Editor 5/19

**WILMAR SUGAR (HERBERT) PTY LTD, Herbert River Mills**
(see LR 267 p.27)
610 mm gauge
Victoria Mill's Walkers B-B DH *Herbert II* (612 of 1969 rebuilt Walkers 1993) was fitted with RSU remote control equipment during the slack season this year. In a first for Wilmar, front and rear facing cameras are being installed on all


***Top:*** *What must rank as the saddest looking loco in the Australian sugar industry is South Johnstone Mill's Com-Eng 0-6-0DM 28 (AA1544 of 1960) which has been stored out of service for many years and is seen here in the navvy compound on 5 May. Photo: Christopher Hart* ***Centre:*** *Proserpine Mill's Plasser PBR-201 ballast regulator (243 of 1984) on loan to Plane Creek Mill crosses the Bruce Highway at Sarina on its way to Mt.Christian on 29 April. Photo: Luke Horniblow* ***Above:*** *EM Baldwin B-B DH* Norham *(5383.1 7.74 of 1974) runs through EM Baldwin B-B DH* Selkirk *(6750.1 8.76 of 1976) at McDesme 5 on the Kalamia Mill network on 10 June. Photo: Luke Horniblow*

*Proserpine Mill's Walkers B-B DH 12 (673 of 1971) on tree trimming duties at Mt.Marlow on 11 June. Photo: Mark Nolan*

locos in the Herbert this year. It is the first time Wilmar has done this to all locos in a single district. There are also fifteen fixed cameras installed at level crossings in the Herbert district. Forty-eight sugar boxes were fitted with new frames and bogies at the Macknade Mill truck shop commencing at the end of April until mid May when the assembly of one hundred and seventy-six new 11 tonne bogie cane bins started. All were manufactured at the Wilmar workship in Ingham with wheel sets and couplers supplied by Bradken. Three hundred and fifty new 11 tonne cane bins are expected to be manufactured next year.

Locos on roster at Macknade Mill this crushing season are Clyde 0-6-0DH locos 11 (65-383 of 1965) and 12 (65-434 of 1965) and EM Baldwin B-B DH locos *Darwin* (6171.1 9.75 of 1975), *Wallaman* (6400.3 4.76 of 1976), *Gowrie* (7135.1 7.77 of 1977) and 20 (7070.4 4.77 of 1977). EM Baldwin 0-6-0DH 14 (6/2490.1 7.68 of 1968) is the sugar loco and Clyde 0-6-0DH 16 (DHI-1 of 1954) is expected to be spare loco. EM Baldwin 0-6-0DH *Hobart* (4413.1 7.72 of 1972) failed with final drive problems early in the 2018 crushing, has not seen service since and may be decommissioned. Clyde 0-6-0DH *Canberra* (65-433 of 1965) has been in use with the navvies over both mill areas during the slack season this year.

Editor 5/19; 6/19; *Townsville Bulletin* 10/6/2019

**WILMAR SUGAR PTY LTD, Inkerman Mill, Home Hill**

(see LR 264 p.27)

610 mm gauge

On 26 April, Com-Eng 0-6-0DH *Osbourne* (AH2866 of 1963) was at the Pioneer Mill workshop, having work done to it and returned on 29 May.

Shane Yore 4/19, 5/19

**WILMAR SUGAR (INVICTA) PTY LTD, Invicta Mill, Giru**

(see LR 267 p.27)

610 mm gauge

Walkers B-B DH *Cromarty* (708 of 1973 rebuilt Bundaberg Foundry 1996) returned from Pioneer Mill by road transport on 7 June and was in service by 14 June.

Wilmar information bulletin 6/19; Kieran Koppen 6/19

**WILMAR SUGAR PTY LTD, Pioneer Mill, Brandon**

(see LR 267 p.27)

1067 mm gauge

An unknown Walkers B-B DH rebuilt from one of the locos stored at this mill was doing running trials during the week ending 27 April. It is apparently to be named *Jerona* and is fitted up for RSU remote control operation. The existing Walkers B-B DH *Jerona* (647 of 1970) is still on site. Walkers B-B DH *Cromarty* (708 of 1973 rebuilt Bundaberg Foundry 1996) returned to Invicta Mill by road transport on 7 June after being rebuilt in the workshop here. Walkers B-B DH 3 *Koumala* (651 of 1970 rebuilt Bundaberg Foundry 1995) returned to Plane Creek Mill by 13 June, probably on 11 June following rebuild here. These three locos have been fitted with Mercedes Benz V8 motors, Allison transmissions and new transfer boxes. Also seen in the workshop on 26 April was another unknown Walkers B-B DH undergoing rebuild. All have the Wilmar livery of yellow body, white valences, silver bogies and frames and red and white striped headstocks. The rebuilds of the two locos for the Burdekin mills cost $3 million. Inkerman Mill's Com-Eng 0-6-0DH *Osbourne* (AH2866 of 1963) was having work done to it at the workshop here on 26 April and returned on 29 May.

A car collided with a cane train on the Bruce Highway level crossing at Brandon on 15 June.

Shane Yore 4/19, 5/19; Luke Axiak 6/19; Mitch Zunker 6/19; Kieran Koppen 6/19; Wilmar information bulletin 6/19; *Townsville Bulletin* 6/6/2019, 15/6/2019

**WILMAR SUGAR (PLANE CREEK) PTY LTD, Plane Creek Mill, Sarina**

(see LR 26 p.)

610 mm gauge

Plasser PBR-201 ballast regulator (243 of 1984) was seen crossing the Bruce Highway at Sarina on 29 April on its way to Mt. Christian. It was on loan from Proserpine Mill. Walkers B-B DH 3 *Koumala* (651 of 1970 rebuilt Bundaberg Foundry 1995) returned from rebuilding at Pioneer Mill by 13 June, probably on 11 June. It is now fitted up for RSU remote control operation. The Karloo siding at the end of the southern line at Carmila was rebuilt commencing in late May. Following earthworks, track laying commenced during the week ending 15 June. An unused transloader was also removed. As well as the existing infield roll-on, roll-off trucks, the new siding will be accommodating B double elevating semi trailers hauling cane from a new area south of Clairview approximately 25 kilometres south of Carmila.

Luke Horniblow 4/19, 6/19; Luke Axiak 6/19; Mitch Zunker 6/19; Andrea Thompson 5/19, 6/19

**WILMAR SUGAR (PROSERPINE) PTY LTD, Proserpine Mill**

(see LR 266 p.29)

610 mm gauge

The rebuild of EM Baldwin B-B DH 10 (9816.1 10.81 of 1981) was completed around mid June. It now has a Mercedez-Benz V8 motor combined with an Allison transmission, a new and larger cab and a new paint job in standard Wilmar livery. It has also been set up for RSU remote control operation. Walkers B-B DH 12 (673 of 1971 rebuilt Bundaberg Foundry 1998) was on tree trimming duties with a single cane bin at Mt.Marlow in June. The Plasser PBR-201 ballast regulator (243 of 1984) was seen on loan to Plane Creek Mill on 29 April.

Luke Horniblow 4/19; Tom Badger 5/19, 6/19; Mark Nolan 6/19

## NEW SOUTH WALES

**MANILDRA, NAMOI FLOUR MILLS, Gunnedah**

(see LR 251 p.26)

1435 mm gauge

Clyde Co-Co DE MM02 (64-342 of 1964), normally seen at Gunnedah was nowhere in sight in mid-April 2019. The whole flour mill siding was devoid of any locomotive or wagons. It is thought this is linked to a report in the *Namoi Valley Independent* of 11 May 2018 when Manildra announced it was "scaling back flour production at the site". 23 workers were affected by the closure –

the only work to remain on the site to be the production of durum semolina. The flour production was said to be moving to another, unnamed, regional town from 1 June 2018. Manildra purchased Namoi Flour Mills in 1974. Has anyone seen the loco?
See further comments under Manildra, and Narrandera.
Phil Rickard 6/19

**MANILDRA FLOUR MILLS PTY LTD, Manildra**
(see LR 266 p.29)
1435 mm gauge
Goodwin Co-Co DE 44208 (G-6045-08 of 1971) and Clyde Co-Co DE MM01 (62-257 of 1962) were seen here on 3 May.
Richie Stalling 5/19

**MANILDRA FLOUR MILLS PTY LTD, Narrandera**
(see LR 261 p.28)
1435 mm gauge
Walkers B-B DH 7340 (702 of 1972). My sightings of this loco at Narrandera started in April 2011 when it was noted as "very dusty – almost white". By March 2014 it was seen in new paint (or had it been washed?) and with a new airconditioning unit installed on top of the hood adjacent to the cab and all cab windows covered. By April 2015 it was starting to reassume its white dusty appearance. Loco was shunting the silos under remote control. Noted again in April 2019 and clean, but stabled, coupled to a rake of tanker wagons. These wagons were originally NSWGR NTAF petrol tankers and were converted to bulk wine tankers for McWilliams Wines and re-coded NTFF. Built by Tulloch, they were last reported as stored at McWilliams siding at Yenda, near Griffiths in 2005. (www.nswgoodsrollingstock.com/NTFF.htm) Maybe some NSW rolling stock expert can clarify their current purpose? Thanks to Henry Owen, it has now been established that Manildra ceased rail operations at Narrandera in mid-2018 and 7340 has been stored there out of use for the last year. All Manildra Group milling operations are now done at Manildra and a new facility at Nowra and all Manildra's previous shunting locos have been stored. In 2018 it bought 2 x 442-class locomotives from CFCLA (believed to be ex J403 and J404), one for each of its facilities for shunting purposes. Can any reader please confirm?
Phil Rickard 6/19

**MANILDRA FLOUR MILLS PTY LTD, Nowra**
1435 mm gauge
Goodwin Co-Co DE 44209 (G-6045-09 of 1971) is possibly at this new facility.
Phil Rickard 6/19

## OVERSEAS

**FIJI SUGAR CORPORATION**
(see LR 266 p.30)
610 mm gauge
The Land Transport Authority (LTA) has imposed a gross weight restriction of 16.5 tonnes on road lorrys hauling cane. The Labasa cane lorry drivers reached an agreement not to deliver cane unless their concerns on the weight restriction were resolved. The LTA has been concerned about the damage caused to roads by overweight lorries for many years. Labasa Mill started crushing on 12 June using cane delivered by rail and tractors hauling trailers. Lautoka Mill started crushing on 13 June with a target of 690,000 tonnes of cane. Lautoka will crush additional cane from the Rarawai Mill area owing to damage done to the Ba River rail bridge during flooding last year. Photos taken at Lautoka on the 13 June show chopped cane bins in use. They appear to be of 3 tonnes capacity and have doors on both sides. One is numbered 1043 suggesting that these units are in the 1XXX number series. Forty of these bins have been funded by the European Union at a cost of $650,000. FSC has acquired thirty-two tractors and will have one hundred and seventeen new 3 axle trucks this year and these would be deployed to assist in transportation of cane to the mills. A report from the Indian government on upgrading the rail system is being waited upon.
FBC News 13/6/2019; *Fiji Sun* 14/6/2019


***Above:*** *Manildra's Clyde Co-Co DE MM02 (64-342 of 1964) shunting the flour mill siding at Gunnedah on 16 May 2018, two weeks before closure. Photo: Phil Rickard*
***Below:*** *Manildra's Walkers B-B DH 7340 (702 of 1972) at Narrandera with a string of NTFF tankers on 17 April. Photo: Phil Rickard*

# LETTERS

**Mount Lyell Railway, May 1963 – Looking Back (LR 267)**

The photographs of the Mount Lyell Railway reproduced in the last issue of *Light Railways*, Number 267, brought back some distant memories.

I spent 1963 in Ulverstone, on the north-west coast of Tasmania, teaching at the town's high school. It was my first year in Australia, and there was much to see and learn. I took advantage of the May school holiday break to visit Tasmania's West Coast. A friend gave me a lift to Burnie, from where the Emu Bay Railway's '*West Coaster*' took me to Rosebery, a service that ceased in January the following year following the opening of the Murchison Highway. Rosebery to Queenstown was by a State Government 'Green Lines' bus.

It was less than three months before the Mount Lyell Railway closed, on 10 August 1963. Visitor numbers were increasing with people wanting to ride the railway, and I was fortunate to get one of the last available hotel rooms in Queenstown, a very old style room in a very old style hotel! The following day, 21 May 1963, I did the train journey to Strahan and back, a trip I will never forget. The mixed train of passenger carriages and goods wagons was hauled by Mount Lyell No. 3, an 0-4-2T locomotive built by Dübs & Co. in Glasgow in 1898. Adding to the sights of the train moving through the rainforests and mountains of Tasmania's West Coast were the 'grunt' of the little locomotive, its whistles, and the added noise of the Abt system. There was a great variety of rolling stock to be seen, wagons, passenger coaches and motive power. Perhaps most unusual was the 0-4-0 Bedford 'bus'. With the impending closure, none of it was being particularly well cared for.

Weston Langford was fortunate to have experienced fine weather on his visit a few months earlier. I was not so lucky: there was thick low cloud, it was cold and wet, at times very wet. It was not good for photography, but those that I was able to take show the railway operating in conditions typical of Tasmania's West Coast. And the lush rainforests were in stark contrast to the bare hills that surrounded Queenstown, then almost totally devoid of any vegetation.

On 3 April 2014, I rode part of the line again, on the restored West Coast Wilderness Railway, then open as far as Dubbil Barril. It was a fine, sunny day. The coaches were new, there were no goods wagons, but coincidentally, Dübs No 3 was once again the motive power. Painted a different green to the greens of the rainforest, it was a delight to see it beautifully restored and in a far better state of health than when I had last seen it more than fifty years earlier.

Peter Crabb,
Canberra.
Via email

**Morts Dock locomotive – Botany Sewage tramway (LR 256)**

In conjunction with failed efforts in late 1902 to obtain a new locomotive to operate at the Botany Sewage Farm, a decision was reached that any further outlay in having the Mort's Dock locomotive overhauled would be uneconomic. Despite that, in early May 1905 the Metropolitan Board of Water Supply and Sewage called for tenders for the supply and delivery at the Inlet House Botany, of a "WROUGHT-IRON SADDLE TANK for LOCO. BOILER."

Advertising - The Daily Telegraph (Sydney, NSW : 1883 - 1930) - 3 May 1905. (p3)

As tenders for the conversion of the Mort's Dock engine to a petrol-driven locomotive weren't called until August 1906, it seems probable that the new saddle tank was fitted and that is why it was noted to be in good condition mid-August 1907, when it was listed for sale along with the engine's cylinders. (*Evening News*, 10 August 1907, p10)

Ron Madden,
Wagga Wagga
via email

**Hunslet locomotives**

Hunslet engine number 303 had a busy life, it went to the Western Front, when the USA entered the war. An advance party must have been sent to the Western Front to learn and operate light railway equipment before their own gear arrived on site. Hunslet 303 was one of the engines they learned to operate. A picture of a group of doughboys around the engine appeared in the book *Two Foot Rails to the Front*.

Barclay engines made two types of locomotive, Type F 0-4-0 well tank, and Type H 0-6-0 which went to the Western Front. The Australian and New Zealand Armies both used these engines, with the Aussies taking them wherever they went. Robert Hudson supplied equipment but they did not make engines as they were sub contracted to Hudswell Clarke. *The Model Engineer* had a series on the Hunslet under the name of Spencer (Winston Spencer Churchill). The Barclays are present

appearing on ME Type 7 and waiting for Type 10 to show its face presently part No 44. Barclay only had the 7 Type 0-4-0 and has had some major work carried out.

I hope this creates further discussion among the locomotive experts and I would appreciate any thoughts that anyone has.

Peter MacDonald
Goulburn, NSW

**WW1 Surplus and memorialised locomotives (Letters LR 264, 265 & 267)**

Richard Horne's letter in LR 267 raises the question of the connection, on the Western Front in the Great War, between the Railway Operating Division (ROD) of the Royal Engineers, and the light railways that fell under the Directorate of Light Railways. The accompanying photograph showed a Hunslet narrow gauge 460T, number 311, carrying the initials LROD on its side tank.

The recently-published *WDLR Companion* (RCL Publications, 2018) points out that during 1916 ROD had become the operator of the first British 600mm gauge lines almost by default. This situation changed when the first Director of the Directorate of Light Railways at GHQ in France was appointed in early October 1916, taking over 130 route kilometres of narrow gauge lines of which about 50 had recently been handed over by the French. The first ten Hunslet locomotives had been delivered by September 1916 and some of the next order followed immediately afterwards. At least some of them had the letters LROD applied, probably before seeing action, with photos existing of 309 and 311 carrying this lettering. In the case of 309 at least, the LROD lettering was still there in February 1917 when it was photographed hauling wagonloads of troops in the snow near Ypres in Belgium.

John Browning
Annerley, Queensland

**The Clarence River Breakwater (LR 262 & 267)**

In his recent letter to the Editor, Garry Allen is pointing to the tip of a very large iceberg in relation to contractor locomotives in NSW.

Up to 1913, there are well over 100 mentions in newspapers of steam locomotives in NSW that were, or could well have been, used for railway and river & harbour works construction by contractors or by the Public Works Department (PWD), when the locomotive(s) concerned have not yet been definitively identified.

More than 60 locomotives built before 1900 have been positively identified in the service of public works contractors in NSW up to 1913. Around 25 locomotives of the same vintage worked for the PWD in the same period, but a majority of these were also used by private contractors.

A major difficulty for researchers is that in many of the newspaper articles or advertisements there is not a great deal of identifying information, while surviving government records that have been located have not offered much assistance. As a result, the task of tracing locomotives involved in NSW public works projects is a daunting one, even though it is reasonable to expect that most (but possibly not all) of the unidentified newspaper mentions would be accounted for among the identified locomotives.

Garry inquired about the identity of the four-wheeled coupled tank locomotive advertised for sale in September 1893, in which even the vendor is unidentified. In my view it is highly unlikely that it was one of the small locomotives '*made on the line*' by Larkin & Wakeford on the Great Southern Railway in 1864-6 (there may have been as many of five of these). C.C. Singleton (in ARHS *Bulletin* 353, March 1967) dismissed them as consisting '*merely of stationary engines mounted on railway wagons*.' I think that it would be rather improbable that such machines could have survived to 1893. My opinion is that the advertisement is likely to refer to the elderly (and unidentified) Hunslet 0-4-0ST locomotive that was eventually purchased in 1895 by C.E. Jeanneret for the Parramatta River Steamer & Tramway Company.

The locomotive advertised for sale by Patrick Higgins in February 1871 was probably used by him on the construction of the Mount Victoria-Wallerawang section of the Great Western Railway. An answer given in the NSW Parliament on 22 May 1871 revealed that the Government had recently purchased a locomotive at Bowenfels from Mr Higgins for the princely sum of £53 2s 7d but I have no further details. 10 tons weight seems very small for an 11" cylinder locomotive.

As for the identity of the mysterious *Hercules*, this is a matter where successive authors of the past took grains of truth and elaborated them into a complex web of unsubstantiated hypotheses, even extending to the locomotive being identified as one that actually never left the UK. Separating the wheat from the chaff is a task of ongoing research.

An article putting forward additional information on the locomotives used on the Clarence River works will be submitted by co-researcher Jon Henry and myself to *Light Railways* in due course.

John Browning
Annerley, Queensland

**LRRSA Online Discussion Group**

Have you joined the LRRSA's email discussion group yet? See:
https://groups.io/g/LRRSA
and click on
**"Sign Up"!**

## LRRSA NEWS

### *MEETINGS*

**ADELAIDE: "More recent photos and movies on Tasmanian railways"**
After the usual business, we will view more recent photos and movies by John Meredith of Tasmanian railways. News of light rail matters will be welcome from any member. Intending participants would be well advised to contact Les Howard on 8278 3082 or by email lfhoward@tpg.com.au, since accommodation is limited.
**Location:**
1 Kindergarten Drive, Hawthorndene.
**Date:** Thursday 1 August 2019 at 7.30pm

**BRISBANE: "To be advised"**
At the time of publication, the meeting details were not finalised. Full details will be given in the members supplement posted with copies of the magazine if available at that time. Details will also be given on the LRRSA website (www.lrrsa.org.au) and the Facebook page *Light Railways of Australia*.
**Location:** Coopers Plains Library, 107 Orange Grove Road, Coopers Plains.
**Date:** To be confirmed

**MELBOURNE: "AGM and more photos from the Ray Graf collection - part 4"**
Following the Annual General Meeting, a range of colour slides will be shown utilising our vintage steam-powered slide projector (celebrating its 43rd birthday). The slides will cover an eclectic mix of locations both within Victoria and some more exotic locales. Included will be a number of tunnelling, tourist and industrial operations, now all long-gone, plus some that are still here!
**Location:** Ashburton Uniting Church Hall, Ashburn Grove, Ashburton.
**Date:** Thursday 8 August 2019 at 7:30pm

**SYDNEY: "The Black Saturday post-fire surveys"**
In 2009, severe bushfires tore through mountain ranges to the north and east of Melbourne. Stuart Thyer will describe the work put in by LRRSA 'field work' teams formed in the fires' aftermath to explore timber tramways that once crossed much of the now burnt out bush land.
**Location:** Woodstock Community Centre, Church Street, Burwood. Free Council car park behind building (entry via Fitzroy Street) or close-by street parking. Only 10 minutes easy walk from Burwood railway station.
**Date:** Wednesday 26 August 2019 at 7:30pm

# Heritage & Tourist NEWS

News items should be sent to heritagetourist@lrrsa.org.au Digital photographs for possible inclusion should be sent direct to Richard Warwick at editor@lrrsa.org.au including the name of the location, the name of the photographer and the date of the photograph.

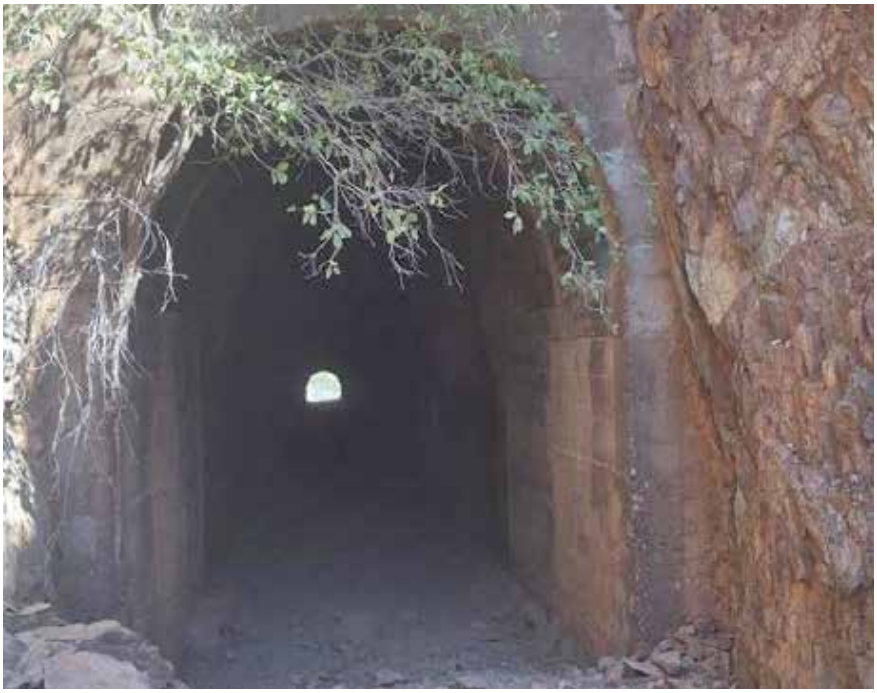
## QUEENSLAND

**PIONEER PARK MUSEUM, Dalby**

750 mm gauge

The Henschel 0-6-0WT (29583 of 1956) was seen on display on 15 April but no work has been done on it in many years. The boiler lagging, dome, side tanks and bottom half of the front of the cab and side sheets have been removed at some time. It was built for the Thai Sugar Corporation's, Chonburi Sugar Factory at Nongchak, Thailand where it was numbered 104.

Christopher Hart 4/19



*The Tunnel on the Wee MacGregor Rail Line The tunnel is 199 m long, 3 m wide and 4 m high. It was built by a gang of nine men hired on a flat contract rate plus dynamite costs. Photo: Derek Barry*

**ATHERTON – HERBERTON HISTORIC RAILWAY, Herberton**

610 and 1067 mm gauges

This site was visited on 4 May and Peckett 0-4-0ST locos *Donald R Walker* (1069 of 1905) and 1174 of 1908 were present with the former well on the way to being restored to working order. Both were originally at Mount Morgan Gold Mining Co. Ltd and subsequently at Mount Isa Mines Ltd. Three of the ex Mulgrave Mill locos were also on site, these being Com-Eng 0-6-0DM 2 (A1001 of 1955), Motor Rail Simplex 4wDM (10450 of 1954) and the mill-built 4wDM "Pie Cart" built in 1962. The Com-Eng has been stripped to footplate level and is to be converted to 1067 mm gauge. EM Baldwin 4wDM 10 (6/881.1 6.64 of 1964) has left the site and was stated to be on loan to someone in New South Wales.

Christopher Hart 5/19

*Henschel 0-6-0WT (29583 of 1956) on display at Pioneer Park Museum, Dalby on 15 April. Photo: Christopher Hart*

***Top:*** *Former Mulgrave Mill locos Com-Eng 0-6-0DM 2 (A1001 of 1955), 4wDM "Pie Cart" (built by the mill in 1962) and Motor Rail Simplex 4wDM (10450 of 1954) at Atherton-Herberton Historic Railway, Herberton on 4 May. Photo: Christopher Hart* ***Centre:*** *Unrestored Peckett 0-4-0ST (1174 of 1908) at Atherton-Herberton Historic Railway, Herberton on 4 May. Photo: Christopher Hart* ***Above:*** *Peckett 0-4-0ST* Donald R Walker *(1069 of 1905) under restoration to working order at Atherton-Herberton Historic Railway, Herberton on 4 May. Photo: Christopher Hart*

**WEE MACGREGOR TRAM AND RAIL COMPLEX, Cloncurry Region**

On 20 March 2019, the Queensland Heritage Council resolved to enter the Wee MacGregor tram and rail complex and the former towns of Ballara and Hightville and Kuridala in the Cloncurry region in the Queensland Heritage Register as State Heritage Places. These towns were very significant in the copper boom in Queensland from 1898 to the end of World War 1.

Royal Historical Society of Queensland's June 2019 Bulletin, via John Browning

**Daniel Ives, Burpengary**

610mm gauge

Daniel Ives has obtained ex-North Eon Mill Hudswell Clarke 0-6-0ST 853 of 1908 as a long-term restoration project. The locomotive was purchased from the estate of the late Graham Chapman, and was moved from Narangba in April. Daniel's father, Bill, is a restorer of steam road vehicles.

It is believed that the other locomotives from the Graham Chapman collection are still at his former storage site at Narangba.

John Browning 4/2019

**Mitch Zunker, Bundaberg**

610mm gauge

Mitch Zunker has purchased Bundaberg Foundry 0-6-2T 4 of 1952 (ex Bingera Mill and Lachlan Vintage Village, Forbes) from the estate of the late Warwick Turner at Echuca and it arrived at a private site in the Bundaberg district during 2018.

John Browning 6/2019

## NEW SOUTH WALES

**Rex J Andrews Pty Ltd, Copeland Street, Kingswood**

610mm gauge

Stored at this transport yard since 2018 are three locomotives that are understood to have been obtained for a projected tourist railway in the Blue Mountains area:

- 0-6-0 Hudswell Clarke 1838/1950 ex Victoria Mill & David Johnstone, Julatten, Qld.
- 0-4-2 John Fowler 17683/1927 ex Racecourse Mill & Budget Demolition Sales, Virginia, Qld
- 4wDM Malcolm Moore 1042/1943 ex Mossman Mill & Ballyhooley Railway, Port Douglas, Qld.

Both steam locomotives are without tenders.

John Browning 5/2019

**Mario Mencigar, Londonderry**

610mm gauge

Mario Mencigar is understood to have acquired the two diesel locomotives that had been restored in Melbourne by Peter Newett. These are Walkers 0-6-0DH 570 of 1955 ex Mourilyan Bulk Sugar Terminal & Mourilyan Mill, and ComEng 4wDH GA1148 of 1961 ex St Marys Munitions Factory & Fairymead Mill. Also included were some ex-Innisfail Tramway flat wagons and a pair of what appear to be South African bogies.

Peter Neve via John Browning 4/2019

**New South Wales Steam Preservation Co-op Society Ltd, Campbelltown Narrow Gauge Railway**

610mm gauge

An Open Day celebrating 40 years of the Society was held at its Campbelltown Steam & Machinery Museum on 18 May. The railway was in operation, with Hudswell Clarke 0-4-0WT 1423 of 1922 (ex National Portland Cement, Tasmania, & Corrimal Colliery) and Hunslet 4wDH 8824 of 1978 (ex Emperor Gold Mines, Fiji, & Barclay Brothers) topping and tailing the passenger train. The following locomotives were also noted:

- 0-6-0WT Krauss 3423/1897 ex Gin Gin Mill & Warwick Turner. Dismantled.
- 0-6-0DM John Fowler 16830/1926 ex Condong Mill & Central Park Railway, Forresters Beach.
- 4wPM Malcolm Moore 1064 1943 ex Australian Army. No engine.
- 4wDM Baguley 3391/1952 ex Royal Australian Navy, Silverwater. Shed.
- 4wDM Ruston & Hornsby 304460/1951 ex NSWGR & Central Park Railway, Forresters Beach. Dismantled.
- 4wDM Motor Rail 11023/1955 ex Condong Mill & Central Park Railway, Forresters Beach. Shed.
- 0-4-0BE Gemcoex New England Antimony Mines. LOT 60. Shed.
- 0-4-0BE Gemco ex New England Antimony Mines. LOT 64. Shed.

John Browning 5/2019

**Railway Lodge Motel, Taree**

610mm gauge

John Fowler 0-6-0T *The Green Hornet* (12271 of 1910) ex Colonial Sugar Refining Co Ltd and Timbertown Wauchope remains plinthed at the end of the motel car park, looking somewhat the worse for wear. A steel cane truck chassis is nearby.

John Browning 5/2019

## VICTORIA

**NEWPORT WORKSHOPS, Newport**

Several self-funded rail preservation organisations have been operating out of the old Newport rail workshops for more than 40 years. Volunteers come on weekends, or before or after working shifts, to protect and restore the vintage stock without charge to the government. But many


***Top:*** *Hudswell Clarke 0-4-0WT (1423 of 1922) at the Campbelltown Steam and Machinery Museum on 18 May 2019. Photo: John Browning* ***Above:*** *Hudswell Clarke 0-6-0 (1838 of 1950) and John Fowler 0-4-2 (17683/1927) at Rex Andrews' property at Kingswood on 18 May 2019. Photo: John Browning*

*John Fowler 0-6-0T* The Green Hornet *(12271 of 1910) at Railway Lodge, Taree on 14 May 2019. Photo: John Browning*

fear that it will all come to an end, which would put a stop to the 60 days a year that members of the public can board the old trains as they run on the state's railways.

Victoria's state railway agency VicTrack, is refusing to guarantee the renewal of the heritage groups' lease, which is due to expire next year. It is reviewing the site, and has brought in consultants to oversee a new strategy, which includes the possible relocation of the trains and rail groups. The heritage-listed workshops would not be relocated, the agency's spokesman said.

The chairman of the biggest rail heritage group, Steamrail, says relocating to a regional area (which the groups believe is most likely) would force them to shut down. Groups like Steamrail rely on volunteers to service the trains, but the bulk of these people live in the city and cannot travel to the country. It would also cost double the price to run the trains on the railways if they are based in the country as the trains would have to do two extra trips, as most of their customers are from Melbourne.

Another heritage group, 707 Operations, faces the same fate. If they are relocated to regional Victoria, they won't exist.

VicTrack argues that as the government runs more train services, it will become increasingly difficult for the steam trains to depart from inner-city Newport. However, rail experts have denied that this is a pressing problem.

The Newport workshops, which opened in 1888, are not the only location in the state where old steam trains are stored, but it is certainly the biggest. When constructed, it was the largest industrial centre in Victoria – the cutting-edge of new railway technology, where locomotives and carriages including those now at the Puffing Billy Railway were made.

*The Age* 26 May 2019

**WALHALLA GOLDFIELDS RAILWAY, Walhalla**

762 mm gauge

WGR achieved its target of $10,000 in the recent crowd funding campaign to complete repairs on the Fowler locomotive. Articles in various newspapers generated a lot of interest with one member of the public from NSW calling to donate $5000 over the phone. Another spinoff was Dulux paints who contacted WGR to offer enough paint to repaint the Fowler, which was another very generous offer. Other tourist rail organisations could consider this as a way to generate much needed funds.

The tram body has finally arrived at Thomson and the four former Z1 Tram bogies have been modified and are now stored at Erica awaiting assembly with the axles/wheelsets. The trolleys which previously supported DH 72 at Yallourn were modified at Thomson in readiness for the first tram body to be mounted on them and allow movement in and out of the W&W shed.

The tram body was lifted at Yallourn and placed on a low loader for relocation to Thomson to ensure compliance with the project milestones agreed with Regional Development Victoria. As previously reported, the new wheel hubs cast by IXL Geelong and the wheel rims purchased from Puffing Billy await fitting to the modified axles. Hardchrome Engineering has provided acceptable quotations for the completion of the wheelsets, so orders were placed immediately and the work is in progress. Progress will now accelerate as there are three separate tasks which can be carried out concurrently: the underframe construction, tram body modification and restoration and windows and door restoration, after which final assembly can commence.

Since the tram body was delivered to Thomson, the 16 side windows have been removed, the four air-operated double-doors and assemblies have been removed for reconditioning and work associated with separating the driver ends from the passenger area continued. The intention is to offer the complete tram front panels for sale to tram enthusiasts who use them to make a novel bar. Seat bases have been delivered to the upholsterer for re-covering.

A risk analysis and report is under way in preparation for the proposed visit of the Climax locomotive from Puffing Billy later this year. However, with the amount of work and expenditure anticipated in the next few months, the Climax visit has been discussed by the Board and has been deferred to 2020.

*Dogspikes and Diesel*, June 2019

**PUFFING BILLY RAILWAY, Belgrave**

762 mm gauge

In May 2019 Emerald Tourist Railway Board and Preservation Society representatives participated in a Vintage Rolling Stock Strategy Forum coordinated by VicTrack. The Forum was a very valuable and rewarding exercise, not only to meet leaders across Victoria's Tourist and Heritage Railway sector, but to understand some of the challenges faced, common issues and various views. A key point evident from the forum is that Puffing Billy has a lead role in participating in the sector, supplying information, and sharing what it perceives to be best practice.

*Monthly News* June 2019

**Warwick Turner Estate, Echuca**

610mm gauge

A number of the locomotives from the estate of the late Warwick Turner have been dispersed in the last couple of years.

Locomotives sold include:

- 0-6-0WT Krauss 3423/1897 ex Gin Gin Mill & Goulburn Steam Museum, NSW
- 0-4-0T Andrew Barclay 1419/1915 ex Qunaba Mill & Maynard Street Park, Bundaberg, Qld
- 0-4-2T John Fowler 16341/1924 ex Tully Mill & Lachlan Vintage Village, Forbes, NSW
- 0-6-2T Bundaberg Fdry 4/1952 ex Bingera Mill & Lachlan Vintage Village, Forbes, NSW
- 0-6-0DM Baguley 2394/1953 ex Victoria Mill & Micky Mina, Hawkins Creek, Qld

The Dick Kerr 0-4-2T of 1910, ex Marian Mill & Pioneer Shire Council Park, Seaforth, Qld, believed to be privately owned, is on site completely dismantled.

John Browning 6/2019

**Private preservation, Numurkah area**

610mm gauge

Stored under cover on a rural property as a long-term preservation project is Hudswell Clarke 0-6-0ST 496 of 1898 ex North Eton Mill & Steve Kele, Rockhampton. Also on site is 4wDM Ruston & Hornsby 285342 of 1949, ex Goulburn-Murray Rural Water Authority. This has been at the ex-State Rivers & Water Supply Commission's Tatura plant for many years, and was purchased at auction in 2017 by someone from Merrygoen, who removed the engine. It was on sold to the present owner in 2017 and a replacement engine is now being sought.

John Browning 6/2019

# TASMANIA

**IDA BAY RAILWAY, Ida Bay**

610 mm gauge

The Ida Bay railway is calling for expressions of interest to restore the 'Silver Streak' at the Ida Bay Railway. The vehicle was originally from the Lake Margaret Tramway in Tasmania which ran from Queenstown to Lake Margaret township and was initially preserved by a Derwent Valley Railway member. It originally had side loader bus style bodywork, but whilst in storage, the original bodywork deteriorated to such an extent that it was demolished, leaving just the under frame. The current body was home-built by a member of the Tasmania Transport Museum. Over the years, the vehicle deteriorated again and now needs a full restoration so that it can be put back on track. If there is any individual or groups interested in the restoration project, they should send a message to info@idabayrailway.com.au with their proposal, time line and budget required for completion of the mission.

Posted by Ida Bay Railway in Ida Bay Railway Insider 29 April 2019

**TASMANIA TRANSPORT MUSEUM, Glenorchy**

1067 and 610mm gauges

On 11 March it was announced that the society had been successful with an application for a $100,000 grant to upgrade rolling stock to main line standard prior to the expansion of train running to Chigwell. The grant is from the Community Development Grants Program delivered by the Department of Infrastructure, Regional Development and Cities, and the application was made via the office of the Member for Clark, Andrew Wilkie MHR. The formal letter advising of the success of the application was received from the Deputy Prime Minister in late March. The value of an independent member appears to be clear.

The grant will largely fund works required to return steam locomotive M5 to good working order. M5 was recently taken out of service as it is due for a 10-year boiler inspection which includes stripping the boiler of lagging and fittings and undertaking non-destructive thickness testing of the boiler plates. In addition, the roller bearings on the leading driving axle need to be replaced and the tender bogies and tank require repairs.

Railcar DP15 also requires some work, particularly to replace faulty electrical wiring. If the funds stretch far enough some re-upholstery repairs will be carried out on carriage AAL10. The repairs to the rolling stock should ensure they will be in a better condition for use on the expanded train running planned for the near future.

Good progress has been made with cleaning the wheels and underframe of steam locomotive H1 and painting them black. Progress is also being made with the refurbishment of carriage B+ 4 which is now looking smart with its new Indian Red paintwork. The refurbishment of the interior of railcar trailer PT4 is progressing, with some painting to finish before the seats and luggage racks can be refitted. The boiler inspection of C22 has been stalled due to a delay with the making of replacement rivets for the smokebox. It is hoped this work will be finished soon.

On 27 April the Museum's workforce started repairs to the rail track at the mainline points where the museum's track connects with the mainline. This included replacing some rails and sleepers and was done in preparation for the day extended running commences to the north.

Tasmania Transport Museum Newsletter, May-July 2019

*Krauss 0-4-0T No 1 (a combination of Krauss locomotives 5682 and 5800) and carriage A1 were providing the rides on 3 March 2019 at the Redwater Creek Railway at Sheffield. The ride takes around 20 minutes between the station at Sheffield and the terminus at the other end of the line. Photo: Alf Atkin*

# SOUTH AUSTRALIA

**PICHI RICHI RAILWAY, Quorn**

1067 mm gauge

Fifty-six years ago South Australian Railways gifted the City of Port Lincoln a heritage veteran of SAR's narrow gauge network. This was a Yx class steam engine, built in Gawler in the previous century to an English design, which had toiled on South Australia's various narrow gauge railways for almost 60 years.

SAR's immense foresight enabled a pivotal item of the State's railway history to avoid the scrapyard, so that future children could understand just what rural rail travel was like in times gone by.

In 1963, Yx141 was placed in a park in Port Lincoln where it delighted thousands of kids for the next 20 years. But the ravages of time were taking their toll on the locomotive and so the City of Port Lincoln and the Pichi Richi Railway Preservation Society arranged an exchange. Eventually the Pichi Richi Railway acquired Yx 141, while the City obtained a diesel loco replacement, more fitting of modern times to thrill present day young minds.

Now, 36 years after that swap, and following an extensive restoration and meticulous overhaul, Yx141 is finally ready to take its place alongside Pichi Richi Railway's other working steam and diesel locomotives. On Sunday 2 June 2019, Pichi Richi Railway ran three trains to celebrate this landmark event. The first train travelled through the Pichi Richi Pass as far as Woolshed Flat and return, while the other two services ran from Quorn to the Summit and return.

Pichi Richi Railway Press release 28 April 2019

**MILANG LIGHT RAILWAY CENTRE, Milang**

Work has started on the conversion of two munitions wagons to passenger use. The local Bunnings store is sponsoring the project and is supplying all materials free worth about $1000.

About half of the track has had the sleepers doubled up to strengthen it to be able to carry the Ruston locomotive.

Members of the group went to look for the two Decauville locomotives at Tailem Bend using local knowledge of their location. Using the available photographs they were able to identify both locations fairly exactly; one by the Jervois ferry and one opposite Wood Point. In both cases there was no sign of the locomotives, however, they did find something that is not the boiler cladding because the rivets do not match. Any further information from any readers would be appreciated.

LRRSA SA Group meeting minutes via Peter Lucas

*Both of these photos were taken by noted rail historian and photographer Weston Langford on the Emu Bay Railway on the west coast of Tasmania in January 1963. The top photo shows the ex TGR EBR Australian Standard Garratt No 20A (4-8-2 + 2-8-4) hauling an up goods train loaded with ore at Guildford on 28 January 1963. The bottom photo shows the same ASG hauling an up goods next to the up Westcoaster hauled by Dübs and Co locomotive No 8* Heemskirk *(4-8-0) at Rosebery. Both photos from the Weston Langford collection. www.westonlangford.com/images/photo/102475 and 102490.*