The Story of the New South Wales Railways.


(Read, in part, before the Society on June 30, 1953.)

This article is an abridgment of a more extensive manuscript describing
the building and improvement of three main railway lines of New South
Wales. The full manuscript may be read in the Society's Library.—Editor.

THE WESTERN RAILWAY LINE.

In the year 1845 the people of Britain were very
railway conscious, and many bills seeking power to build
lines were lodged with Parliament. Amongst them was
one promoted by a group styled the Sydney, Parramatta,
Richmond and Windsor Railway Company. It requested
authority to construct a line 40 miles long at a cost of
£500,000. But nothing, however, came of it.

There was also interest in railways shown in Australia
and proposals made locally for the construction of lines.
At a public meeting held in Sydney on January 29, 1846,
it was suggested that a line be laid from Sydney to
Goulburn. On May 18 of the same year, a deputation
consisting of Mr Charles Nicholson, Mr M. B. O'Connell
(Mayor of Sydney), Mr William Walker and Mr H. G.
Smith, representing the directors of the Great Southern
and Western Railways Company, waited upon the Governor,
Sir George Gipps, to lay before him their proposals for a
railway line to Goulburn and Windsor, and to inquire as
to the conditions upon which land could be acquired for
such purposes. His Excellency promised to lay the matter
before the Secretary of State, Mr Gladstone, in a favourable
light. The company engaged Lieutenant Woore, R.N.,
to survey the route for them, and, upon the presentation
of his report, another public meeting was called for January
27, 1848. At this gathering the Sydney Railway Company
was formed, with Mr Charles Cowper as president and
manager. The Company was incorporated on October 1, 1849. It was proposed that a line should first be laid from Sydney to Parramatta, the Sydney terminal being at Redfern in the Cleveland Paddocks.

On July 3, 1850, the Hon. Mrs Keith Stewart, daughter of the Governor of New South Wales, Sir Charles FitzRoy, turned the first sod of the line at Redfern in the presence of a large crowd, on whom heavy rain fell steadily throughout the ceremony. A contract for the earthworks was let on March 12, 1851, to Mr William Wallis. He began to build the necessary culverts, embankments and bridges from Haslem's Creek towards Sydney for a distance of 4½ miles at a contract price of £10,000.

Two factors, however, caused a delay in proceedings. The first was a lengthy argument between the colonies about the gauge of the track to be used. Earl Grey let it be known that he favoured the width of 4 feet 8½ inches, which had proved satisfactory in England. In 1851, New South Wales suggested the adoption of the gauge, and Victoria and South Australia agreed. Then New South Wales changed its mind, through the influence of an Irish engineer it is said, and decided to adopt the Irish gauge of 5 feet 3 inches. This was incorporated in the Railway Act of 1852. Victoria and South Australia decided to fall in line with the Mother Country, and the Hobson's Bay Railway began work on this gauge in 1853 on its line from Sandridge (Port Melbourne) to Melbourne. A line was also begun in South Australia. Then, later in 1853, New South Wales decided to switch back to the 4 feet 8½ inches, another change of engineers having taken place. The other colonies refused to change again.

The second factor which delayed the building of the line to Parramatta was the absence of an adequate labour supply through the gold rush. To overcome this, the railway company brought out 500 men from England, and progress on the line was resumed.

The first contractor having withdrawn in July, 1852, William Randle was given the task of continuing the construction work in August of the same year. Included in his effort was the erection of the stone viaduct at Long Cove (Petersham), the first railway viaduct in New South Wales.

But by now the abnormal supply of gold and wealth had led to a large increase in wages and costs, and the
company became involved in financial difficulties. As there seemed no way out, the Colonial Government assumed control and the line was completed on September 3, 1855. Four locomotives and tenders were ordered from Robert Stephenson & Company of Newcastle-on-Tyne, while the carriages were ordered from Wright & Son of Birmingham. The line was opened to traffic on September 26, 1855, a distance of 13 miles 28 chains, having cost £565,710 to build and equip. The control of the railway under the provisions of the Railway Act of 1854 was vested in three commissioners, Captain Ward, Mr Barker and Mr Kemp being the first selected. In December, 1858, a change was made, and Captain Martindale was appointed the sole commissioner.

The first two railway tickets issued, both first class single from Sydney to Parramatta, were issued to Thomas Day, junr. Mr Fielding was the first stationmaster at Sydney.

The original Sydney Station was in the Cleveland Paddocks at Redfern. It was an iron structure with a single platform, and it lasted until about 1874, when it was replaced by a brick and stone structure covering two platforms and having two bays.

The official train* at the opening of the line consisted of two first class carriages, four second class, and five third class. The Governor-General, Sir William Denison, travelled in the first carriage. The fares on that occasion were four shillings, three shillings and two shillings for the respective classes for the full journey. The journey took forty-five minutes to complete, and ended in heavy rain.**

After the opening, there were six trains each way each week-day and four each way on Sundays. Fifty minutes were allowed in the time-table for the trip. There were four intermediate stops—Newtown, Ashfield, Burwood and Homebush. Platforms at Petersham, Haslem's Creek (Rookwood, then Lidcombe), Redmyre (Strathfield), Five Dock (Croydon) and Eveleigh (Redfern) were added.

* It was not the first, as one had been run at 9 a.m. that day. The official train was due to leave at 11 a.m., but was twenty minutes late.
** The train driver was William Sixsmith, referred to in Vol. XVII., p. 215 et seq. in the Royal Australian Historical Society's Journal.
in subsequent early years of the railway. Through fares were four shillings first class and two shillings third class.

An interesting notice concerning Haslem’s Creek or Rookwood (Mortuary Station No. 1, opened in 1864) appears in the first edition of the Railway Guide of N.S.W. (1879). I quote it:

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**TRAIN FARES TO HASLEM’S CREEK.**

Corpse carried free of charge.
Friends of the corpse one shilling each.
**Note.**—In the case of paupers’ funerals, corpses and their friends are carried free.

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With this first stage completed and in operation, moves were made for extensions both to the west and south. The first sod of the section from Parramatta to Penrith was turned at Penrith on July 6, 1859, by Mr R. T. Jamison, M.L.A. for Nepean, in the presence of a large crowd. But the southern line to Liverpool, opened in 1856, and to Campbelltown, opened in 1858, received first attention, and it was July 4, 1860, before the next section of the western line, from Parramatta to Blacktown, a distance of eight miles, was completed.

A new station was erected at the point of divergence of the two lines, and was named Parramatta Junction, later becoming Granville. A new station in Parramatta, on the present site, was also built to replace the original one erected near where the Liverpool line crosses Dog Trap Road (now Woodville Road). For the new station, Captain Aldridge was the first stationmaster, Mr H. V. Read having been in charge of the old one.

In the following year, £60,000 was placed on the Estimates for the construction of a horse railway to be laid between Blacktown and Windsor. On January 15, 1863, the Hon. W. M. Arnold turned the first sod of the branch line in Mr Hale’s paddock adjoining Market Square, Windsor.

There was considerable discussion in the colony on the value of horse railways, and the Governor-General, Sir W. Denison, was a strong advocate for this method of locomotion. He urged the Legislature to ensure that
future extension of the railways, even as far as Albury and Bathurst, should be carried out in this way. Thus the Richmond line was more or less a test case, but it was not approved. In 1864 an additional £15,000 was voted to allow the line to be a locomotive one, and the track was officially opened on November 29, 1864, as a steam line. The first public train ran on December 1 following, the fares being 8/6 first class and 5/- second class single from Windsor to Sydney, and 9/3 and 5/6 respectively from Richmond.9

In the meanwhile the line to the west was moving steadily ahead. In 1861 it had reached Rooty Hill, and by May, 1862, it was opened to South Creek, now St Marys. The Government required the contractors to complete the line within a prescribed time, and by this the contractors refused to be bound owing to difficulties that had occurred in securing possession of the land close to Penrith. They carried the line to Parker Street, now Kingswood, before their contract terminated, and this section was opened to traffic on July 7, 1862. Werrington Station, between this point and St Marys, was known as Parkes for a while. Another contractor, Mr John Gibbons, came to the rescue, and the line to Penrith was completed for traffic on January 18, 1863.10

Penrith remained the terminus for the western line for just over four years, and this was the starting point for the coaches over the Blue Mountains. In Bradshaw’s Guide of 1863, Cobb and Company advertised their services. Two coaches a day were available to Bathurst, the day coach and the mail coach. Fares by the day coach were £2/5/- per person, and £2/15/- by the mail coach. These were busy days in the town’s history, and the arrival and departure of coaches and trains kept many people active, both directly and indirectly.

The barrier of the Blue Mountains was the next obstacle. To overcome the mountain barrier, an easier graded route than that required for coaches was necessary. Some thought it an insuperable barrier for railway trains, while others put forward wonderful schemes for overcoming it. The Rev. John Dunmore Lang, the eminent Presbyterian divine, expressed his ideas in 1852, making a remarkable suggestion:—

One of the great works which the discovery of gold will render indispensably necessary for the western interior is the contribution
of the railway which is now in progress at Parramatta as the first stage of the route to Goulburn, from Parramatta to Bathurst. This, I conceive, might be effected with comparative facility by running the line on the present level to the eastern base of the mountain, and then running a line from thence on the higher level to the western extremity. A stationary engine at each extremity of the mountain line would be sufficient to elevate or lower goods and produce of all descriptions at these two points; passengers could walk up or down from one level to the other by a long staircase, as at the Thames Tunnel.11

In 1856, a preliminary survey of possible routes for a railway had been made by sappers of the Royal Engineers under Captain Hawkins, but they were not very hopeful. The best route they could see was a little to the west of that used eventually by Mr John Whitton, Chief Engineer of Railways. Again, in 1862, another survey was made, and three possible routes were explored. One followed Bell's line of road via Mount Tomah and Kurrajong. This proved too steep. The second followed, the Grose Valley to its head, then by a long tunnel under the Darling Causeway to Hartley Vale, but it was considered unsuitable because of unstable terrain. The third route was the one eventually adopted, that following more or less the road over the Blue Mountains, and thus the railway came to be laid alongside a large portion of the track of the intrepid three—Blaxland, Lawson and Wentworth—who made the first crossing in 1813.12

In March, 1863, a contract for the earthworks of the section to Valley Heights was let to William Watkins, and in October, 1865, one for laying permanent way to Messrs Larkin and Wakeford. In the meanwhile there was considerable discussion as to the best method to take trains up the steep rise of Lapstone Hill. The Chief Engineer, Mr Whitton, favoured a tunnel, but owing to the expense that would be involved this idea was abandoned. So, with the help of Mr George Cowdery and others of the engineering staff, he planned and constructed what has become known as the Lapstone Zig Zag with a gradient of 1 in 33. Two bridges were required to enable the line to reach the site of the Zig Zag. The first was built over the Nepean River between Penrith and Emu Plains, and is known as the Victoria Bridge and cost £110,000.13 Originally it was a continuous box-girder bridge 906 feet with approaches, but damage by floods in 1867 caused the design and length to be altered slightly. It was built on four huge piers of solid masonry, and was
designed by the Chief Engineer, Mr Whitton. Although planned for a double rail track, the destruction of the road bridge close by in floods caused a change in plan, and it opened to carry a single line of road traffic and a single railway track. The present railway bridge was opened in 1907.

The second bridge was the Knapsack Viaduct, 388 feet in length, also designed by Mr Whitton. With seven stone arches, 126 feet high at the centre, spanning Knapsack Gully, it is a graceful and solid piece of work. Since 1926 it has been used as part of the Great Western Highway up Lapstone Hill, and, to serve the increasing traffic, was widened in 1939 from the original 18 feet to 30 feet. The viaduct was completed in 1865, and the Victoria Bridge in 1867.

When the Zig Zag was completed, it was possible to raise trains from an altitude of 87 feet above sea level on the plains to 613 feet at the summit of Lapstone Hill. Those associated with that part of the line tell fearsome tales of engines descending the Zig Zag on wet, slippery nights in the days before air brakes were added to trains. Engines were put into reverse gear to prevent them skidding past the top points and diving over the dead-end into

*Westinghouse brakes were introduced on to passenger trains in 1877, and gradually they were fitted on to goods trains. By 1890 the fitting out was completed on all trains.
Knapsack Gully. Possibly the only serious accident to a passenger train, however, occurred on March 22, 1886, when a tourist train from Bathurst, consisting of an engine, nine carriages and a guard’s van, overran the clearance points at the top wing and collided with the buffer stops. The engine and two carriages were damaged and several passengers injured.

GLENBROOK TUNNEL.

The line as far as Weatherboard, now called Wentworth Falls, was completed and opened on July 11, 1867. On the first time-table there were four intermediate stopping places, viz., Emu (Emu Plains), Wascoe’s (Blaxland), Springwood, and Blue Mountain (Lawson). A fifth, Buss’s (Woodford), was opened in this section in the following year.

In the early days of the railway, it seemed that there were two principal reasons why platforms were placed at particular spots. One was the presence in the neighbourhood of one of the old coaching inns. Thus the platform at Wascoe’s was named after John Outrim Wascoe, landlord of the well-known “Pilgrim Inn” nearby. It was renamed Blaxland in 1879.

Buss’s was another inn some miles further along the road to Bathurst. This building is still standing. When it ceased to be an inn it became a school, Woodford Academy, run by Mr Macnamey. The old notice board, still on the front of the building, could be seen from the
train until quite recently. It is now used by Presbyterians of Woodford as a place of worship. The railway platform was opposite this building. Some few years later, Mr Alfred Fairfax built a home nearby and called it "Woodford." The name of the station was changed to this in 1871. Woodford Station has had four different sites. The second, opened in 1877, was about half a mile from the present Hazelbrook Station. In 1880 it was moved nearer Sydney, and finally in 1922 took its present site.

Weatherboard Inn was one of the best known of the coaching inns on the Blue Mountains. It stood in the large field to the left of the present line after leaving Wentworth Falls Station. The present name was given to the station in 1879.

Just a little beyond the station on the right, before reaching the overbridge, is a solitary grave with its headstone. The inscription reads: "Sacred to the memory of James Ferguson, who was killed by lightning on 21st December, 1859, aged 22 years and 10 months." Local tradition says he was a drover, the old highway nearby being the only route across the Mountains for driving cattle. It is also thought possible that there was a small cemetery here, and this grave is the sole remnant. Another grave, incidentally, is located below the northern side of the embankment 150 yards beyond Linden. This is of Constable Donohoe, reputedly killed by bushranger King.

Blue Mountains Station was close to the Blue Mountains Inn. It was a full station in contrast to the other stopping places, which were only designated as platforms. Its name was changed to Lawson on April 21, 1879, the old title having been somewhat misleading to tourists. Trains were watered here, and a small dam across a nearby creek was constructed to hold water. It proved insufficient as traffic developed, and later became swimming baths for the township. It now is the Olympic Pool. Linden then supplied the balance of the necessary water.

A note in the 3rd Edition of the *N.S.W. Railway Guide* states that the Government decided to alter the names of Wascoe's, Blue Mountains and Weatherboard Stations to honour the three explorers of 1813—Blaxland, Lawson and Wentworth.

The second reason for the establishment of a railway platform was the presence of the residence of a person
sufficiently influential to persuade the railway to cater especially for him and his family. Thus at the top points of the Lapstone Zig Zag there opened in 1874 a platform known as Lucasville, to serve the needs of the Hon. John Lucas, M.L.A., whose residence of that name was just above on the hill. It remained in use until the Zig Zag was closed in 1892. The concrete platform is still to be seen in the scrub above the western highway.\textsuperscript{15}

\begin{center}
\textbf{LITHGOW ZIG-ZAG.}
\end{center}

Similarly, in 1875, Eager's Platform was opened to serve the needs of Sir Geoffrey Eager, who lived at "Wyoming" on the northern side of the line, and at what we know as Valley Heights to-day. In 1877 the platform was renamed "The Valley," and finally received the present name in 1890. When the line was duplicated in 1902 the level crossing of the Bathurst Road just beyond the station was eliminated, but the old gatehouse with its date 1867 remains. There are several of these dated stone cottages beside the Blue Mountains line, and most of them mark the site of former level crossings. Incidentally, the Valley implied in the name of the locality is Fitzgerald's Gully, on the northern side of the line. It is of interest because of its geological formation, being old volcanic rock which has given the valley a good productive soil.

In 1867, the now vanished platform of Numantia was opened between the present Faulconbridge and Linden
Stations. It was close to land owned by Sir James Martin, and the platform was principally for his family's use. On the southern side of the line is "The Bungalow," built partly on the extensive foundations covering five acres upon which was begun, but never completed, a large house for Sir James. It became known as "Martin's Folly" after its abandonment. The platform of Numantia was closed to the public in 1891, and was used privately by the Martin and Cliff families until 1897, when it was dismantled.

In 1877, Fauleonbridge, on a more easterly site than the present station, was opened for Sir Henry Parkes, Premier of New South Wales. The modern station was built in 1902, when the railway line was duplicated. The home and tomb of Sir Henry are on the left side of the line from Sydney.

Breakfast Point Platform was opened at a spot nearly opposite the main entrance of the Lapstone Hotel for the benefit of Mr Want, who lived nearby. This platform, like Lucasville, went out of use when the Zig Zag was closed in 1892.

Two other platforms on this section appeared as the result of watering arrangements. Midway between Lucasville Platform and Wascoe's (Blaxland), there was a water-tank fed by a lagoon which is about one mile north of the present Glenbrook Station. While the engines watered at this spot, it was possible to board or leave the train. Water Tank became known as Wascoe's Siding, and was made a public platform in 1874. Its name was changed to Brookvale in 1878, and to Glenbrook in 1879. When the line was re-located through The Gorge in 1913, the site of the station was moved to its present location. The old station stood by the side of the present highway at Glenbrook, the road having been built on the earthworks of the former line.

Linden appeared first as a crossing loop with a small private platform on August 4, 1874. In March, 1882, it was a public stopping place with two crossing loops, and appears as a platform in the time-table of 1883 as Seventeen Mile Hollow. In 1885 a water supply was arranged —the tanks filled from a dammed gully, Woodford Creek, in the hills about a mile to the north. Here trains were watered for some years until the Wentworth Falls Reservoir came into use.
However, we have pushed too far ahead with the general story. As mentioned earlier, the Penrith–Wentworth Falls section of the line was opened in 1867. The next section, Wentworth Falls to Mount Victoria, was opened on May 1, 1868. The only stopping place on this part was Govett’s Leap, established as a platform in 1869 and renamed Blackheath in 1871.

It is interesting to note that when the line was opened through to Mount Victoria in 1868, Katoomba, now the tourist centre of the Blue Mountains, was unknown. There was a small settlement at Pulpit Hill, beyond the Explorers’ Tree, where a hostelry, “Shepherd and the Flock,” was situated. At the site of the present-day Katoomba there was a quarry, traces of which can easily be seen in the little park near the level crossing. Here large quantities of ballast were produced for the railways. A siding with a timber platform was opened in 1874, with the name of “Crushers,” taken from the crushers of the nearby quarry. A single platform, known as Katoomba, was opened in 1877, and the present island platform in 1891, when a crossing place was laid out to allow the two Orange Day passenger trains to pass.

It was the opening of a coal mine in the Jamison Valley by Mr J. B. North in 1881, and the introduction of sawmills, as well as the discovery of places of scenic interest, that led to the development of Katoomba, the place of “The Falling of the Waters.” A double track skip tramline ran from the top of an incline above the coal mine to North’s Siding, three-quarters of a mile beyond Katoomba, and crossed under the Bathurst Road by a bridge which remains derelict today. The track up the incline is now known as the Scenic Railway at Katoomba, and is all that remains of the line. The original Katoomba settlement was near the Orphan Rock; here the miners lived.

A siding was opened at Medlow in April, 1880, and was known as Brown’s Siding. But, however, as there was a Brown’s Siding in the Lithgow Valley, some confusion ensued; thus in May, 1883, the name was changed to Medlow. After the opening of the Hydro-Majestic by Mr Mark Foy in 1903, the name was again changed to Medlow Bath.

From Valley Heights to Katoomba the railway covers
twenty miles of the steepest climbing on any line in Australia. There is a total rise in altitude of 2,280 feet between the two stations, half the distance having a gradient of 1 in 33.18 This will explain why a second engine is added to most trains before they begin to climb from Valley Heights, and why all goods trains leaving Katoomba going down the range have their brakes applied and tested.

![Clarence Tunnel](image)

**CLARENCE TUNNEL.**

With the line now as far as Mount Victoria, it is perhaps a suitable stage at which to mention the famous Blue Mountains Evening Express, commonly known as "The Fish." It was in the 'sixties when this train, the afternoon "down," began its regular run. In the Railway Historical Society's *Bulletin No. 138*, the reason for the name of the train is given:—

The reputation and tradition of 'The Fish' dates back to the days of the Singles (locomotives of a special type). Big, burly and grim driver, Jock Heron, with No. 15 (engine), established a reputation for fast running, and each evening, as he challenged the signals at Penrith, the remark would be made, 'Here comes the big fish'—as he was known to all and sundry at Penrith. He continued to run the train for many years, and legend has added the names of Salmon and Pike to the train crew. But while railway records confirm the name of Pike, they remain silent on Salmon.

In time, his nickname was given to the train, and is officially used to-day.

The line to Mount Victoria has been open for 83 years, first as a single track, but since 1902 a double track
throughout, except for the isolated section of single line between Emu and Glenbrook, which lasted until 1913. It is interesting, therefore, to compare the fares and running times at certain periods of bygone days with those of to-day:

**COMPARISON OF SINGLE FARES.**

<table>
<thead>
<tr>
<th>PENRITH</th>
<th>MT. VICTORIA</th>
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<tbody>
<tr>
<td>1st Class. 2nd Class. 3rd Class.</td>
<td>1st Class. 2nd Class.</td>
</tr>
<tr>
<td>1863</td>
<td>8/3</td>
</tr>
<tr>
<td>1871</td>
<td>7/6</td>
</tr>
<tr>
<td>1952</td>
<td>4/9</td>
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</tbody>
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(N.B.—Third class travel was abolished in 1863.)

**COMPARISON OF TIME TABLES.**

<table>
<thead>
<tr>
<th></th>
<th>1862</th>
<th>1866</th>
<th>1871</th>
<th>1952</th>
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<tbody>
<tr>
<td>Sydney</td>
<td>8.00</td>
<td>8.00</td>
<td>8.00</td>
<td>8.00</td>
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<tr>
<td>Parramatta</td>
<td>9.00</td>
<td>9.00</td>
<td>8.44</td>
<td>8.27</td>
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<tr>
<td>Seven Hills</td>
<td>(Not open)</td>
<td>(Not open)</td>
<td>9.00</td>
<td>—</td>
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<tr>
<td>Blacktown</td>
<td>9.25</td>
<td>9.20</td>
<td>9.11</td>
<td>8.37</td>
</tr>
<tr>
<td>Rooty Hill</td>
<td>(Not open)</td>
<td>(Not open)</td>
<td>9.21</td>
<td>—</td>
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<tr>
<td>South Creek (St Marys)</td>
<td>9.40</td>
<td>9.35</td>
<td>9.32</td>
<td>—</td>
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<tr>
<td>Penrith</td>
<td>9.55</td>
<td>9.50 (115)</td>
<td>9.45 (105)</td>
<td>8.52 (52)</td>
</tr>
<tr>
<td>(End of line till 1867)</td>
<td>9.55</td>
<td>8.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emu Plains</td>
<td>10.0</td>
<td>10.0</td>
<td>10.31</td>
<td>9.18</td>
</tr>
<tr>
<td>Wacoo's (Blaxland)</td>
<td>10.0</td>
<td>10.0</td>
<td>10.31</td>
<td>9.18</td>
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<tr>
<td>Springwood</td>
<td>10.47</td>
<td>9.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buss's (Woodford)</td>
<td>11.18</td>
<td>10.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue Mountains (Lawson)</td>
<td>11.25</td>
<td>10.24</td>
<td></td>
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<tr>
<td>Mt. Victoria</td>
<td>12.49 p.m.</td>
<td>11.12</td>
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<tr>
<td>(N.B.—The figures in parenthesis after Penrith and Mt. Victoria show the running time in minutes for comparative purposes.)</td>
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In the 'sixties a combined western and southern mail train ran to Parramatta Junction, where it was divided. Jock Heron, on Engine No. 15, used to take the western portion in hand at this point.

The next section of the line to be opened was that from Mount Victoria to Bowenfels, opened on October 18, 1869. It is probably the most spectacular part, for it includes the famous Lithgow Zig Zag. At the time of the opening there was no intermediate stopping place, but a siding was opened in 1870, known for six years as Hartley's Siding, to handle supplies of shale from the mines in the valley below. A platform was erected in 1876, when the name was changed to its present designation. Mount Wilson Station was opened on May 5, 1875, and its name was changed to Bell in 1889. Bell was moved to its present site in 1910.

The Clarence Siding was opened in 1874 for the crossing of trains, and this was the highest point on the line, having an altitude of 3,658 feet above sea level. The track then plunged into the Clarence Tunnel, 1,617 feet
long. In the original line there were heavy grades between Bell and the Clarence Siding which proved a trial on the run. A deviation, known as Dargan’s Deviation, from the name of the nearby Creek, was opened in 1897 to avoid these climbs.

At Newnes Junction, a private line led to the refinery of the Commonwealth Oil Corporation at Newnes in the Wolgan Valley. It has since been abandoned.

From the Clarence Tunnel the line swung to the south, then west around Mount Sinai to the top of the spur overlooking the present town of Lithgow, from which it descended to the valley below by a zig zag. The construction of the Lithgow Zig Zag was a monumental work. It was designed by Mr Whitton and constructed by Mr P. Higgins. Work was begun on it in 1866. There were three stone viaducts in the lay-out.

On the middle road there was need for some unusually large blasting, and two blasts for this were fired by electricity—the first time it had been used in this kind of work. Altogether one and a quarter million yards of earth were excavated. In the third edition of the Railway Guide of New South Wales, it is said:

From the Clarence Tunnel to the bottom of the valley, there is a descent of 687 feet, through a deep and rugged ravine where formerly there was scarcely footing for a mountain goat, and where surveyors’ assistants had occasionally to be suspended by ropes in the performance of their duties; but human enterprise and skill have opened a pathway through these broken mountain ranges for the railway train.

At the top level, the lead or wing past these points came to a dead end at the edge of a 200 feet drop overlooking Vale Colliery. Several accounts are given of trucks over-running the end and dropping into the valley below, and in 1907 an engine, No. 246 B-Class, came to rest with its front wheels hanging over the precipice.

It can be readily understood that the Zig Zag would be dangerous in wet and foggy weather, particularly before the air brake was in use on all trains. Great care was taken to keep the line free of opposing traffic by the use of the electric staff, and a speed limit of ten miles an hour downwards and fifteen miles an hour upwards was enforced. Long trains were divided at the top of the Zig Zag and taken down in two divisions. Twenty-seven minutes was allowed for the operation downwards and fifteen minutes upwards.
By 1885, owing to a bottleneck in west-bound trains having developed, a deviation avoiding the zig zag was being considered. The lead or wings at top and bottom points were, in the meantime, lengthened to reduce the splitting of trains. Some traffic was being diverted through Harden and Blayney to Bathurst and the west. Amongst the ideas put forward for an alternative was one discussed when the original line was built. That was to take the line down the mountain range from Mount Victoria, circling Mount York into Hartley Vale, but it was not received with favour. Another idea was to construct a tunnel between top and bottom points. Eventually a plan drawn up by Mr T. Kennedy, Chief Surveyor of the Construction Branch of the Public Works Department, a bold conception, was adopted. Eleven tunnels were to be made and eight gullies crossed to gain a much easier grade on the range and avoid splitting trains. Work was begun on June 1, 1908, and the deviation was opened on October 10, 1910, being 52 chains shorter in length and 25 minutes shorter in running time than the old one. One of the tunnels was converted into an open-cut during working operations. It was an immense task to build the deviation, over 600,000 cubic yards of earth having to be excavated from the cuttings and nearly 200,000 from the tunnels. The main road from Bell to Lithgow uses many of the embankments and cuttings of the old line from a spot close to Bell Station to Mount Sinai, about two miles from the top of the Zig Zag.

On the other side of the mountain ranges similar trouble had been experienced at the Lapstone Zig Zag, and on December 18, 1892, a deviation was opened which avoided this. From near Bottom Points the line continued on a 12-chain curve and swung through a one-track tunnel 2,165 feet long, built by Proudfoot & Company. It reappeared beside the old line after passing under it not far distant from Glenbrook Station. This tunnel did not prove popular with either train crews or passengers, for, through poor ventilation, the smoke and fumes were often overpowering.

In 1908 a goods train was working up the hill and through the tunnel, aided by a pusher engine behind. It stalled in the tunnel, and the crew of the push-up engine were so overcome by the smoke and fumes that they decided to drop back out of the tunnel for air. Just as
they decided to return, the crew of the train engine, who by then were in a bad state, decided to back the whole train out. They collided with the push-up engine coming in. The resultant wreckage caused a complete blockage of the western line for two days.

The duplication of the line from Glenbrook to Mount Victoria tended to cause a bottleneck at this tunnel, but alternatives to it seemed enormous and expensive. However, before a decade had passed, it became obvious that something was needed, and a completely new deviation, the present route, following the gorge of Glenbrook Creek, was begun in 1911. Rock work on the new line was heavy, and a wider and more airy tunnel to accommodate the two tracks was necessary. But by May 11, 1913, the down line was completed and put into use, and the up line on September 25. Both old and new lines were now in use, the old line being used for certain "up" trains, and Glenbrook had then the distinction of having two railway stations, half a mile apart, in use at the same time. With the completion of the second track on the new deviation, the old line was closed and the first Glenbrook Station dismantled. The old tunnel still remains, and was used in connexion with the Defence Forces in World War II. With the new deviation opened for use, the duplication of the line from Sydney to Bowenfels, which had been begun and largely completed in 1902, was an accomplished fact. The lay-out of several stations was altered in the process, and island platforms became a common sight.

The line had reached a site near Bowenfels in 1869. The Lithgow Valley was undeveloped at the time, being largely pastoral property of Thomas Brown, whose residence still stands near Old Yard, Lithgow, close to the Goods Shed. But industry was on its way, and in the next decade several companies were to begin operations in coal and iron mining, smelting, brick and tile making. To serve their needs, two stations were opened—Eskbank, near the foot of the range, and Lithgow, half a mile away. The latter was put into use in June, 1874, and the former in June, 1877. A large yard with engine sheds was constructed near Eskbank, and is known as the Old Yard to-day.

Eskbank Station was abandoned as a passenger station in 1925, and is now the Lithgow Goods Station. At the same time the Lithgow Station was closed and a new island
platform, called Lithgow, was opened at a point about half way between the two former stopping places. The site of the old Lithgow Station can be noted by observing the first overhead bridge on the Bathurst side of the present station. That bridge passed immediately over the centre of the old platforms, the wall of one of them being still visible.

The continuation of the line from Bowenfels was completed in seven stages. The Bowenfels–Wallerawang section was opened on March 1, 1870, and that to Rydal on July 1 of the same year. It was extended to Locke's Platform (now Locksley) on April 22, 1872; to Macquarie Plains (now Brewongle) on July 1 of the same year; to Raglan on March 4, 1873; and to Kelso on February 4, 1875. The line finally reached Bathurst amidst general rejoicing on April 4, 1876, a distance of 132 miles from Sydney. It had cost £2,112,000 to build, or an average of £16,000 a mile.20

In 1927, an extensive deviation of the line from a point just before Marrangaroo Station to the Cox's River Viaduct, before reaching Wallerawang, was opened. This avoided a steep climb with a gradient of 1 in 40 up to a tunnel through the Marrangaroo Range, and a similar descent on the other side. The work of the deviation was begun in 1919, and opened two years later. Traces of the old line are clearly visible from the Mudgee Road and on the western side of the present track between the Marrangaroo Station and Cox's River. Beyond Cox's River the line surmounts the Main Dividing Range near Rydal, and then follows Solitary Creek. In the original lay-out there were sixteen creek crossings in four and a half miles!

The second point of note is at the junction station, Tarana. Here the line from Oberon, opened in 1923, joins the main line. It is an unusual line with curves of five chains and a gradient of 1 in 25. The curves of eight chains were soon removed from the original line over the Blue Mountains and were replaced by twelve-chain curves to save the cost of frequent renewals and permit higher speeds. Thus the five-chain curves are sharp. These factors call for a special type of engine, the 19 Class, to negotiate the curves, and a strict speed limit is maintained. There is no turn-table at Oberon, thus the engine goes tender-first along the up grade. The line follows a
creek as it winds up a very picturesque gully, and it is quite an experience to travel on this train.

With the line extended to Bathurst, the people of the west were provided with a safer, speedier and cheaper method of transport for both goods and passengers. The Blue Mountains roads were seldom in good order, and, even after the construction of Mitchell’s Victoria Pass, it was still quite a nightmare journey. With the opening of the railway the roads became even worse, and it was not until the arrival of the automobile that progress was made in that direction.

JOHN WHITTON.

John Whitton, the first Chief Engineer of Railways, was a brother-in-law to Sir John Fowler, Bart., an engineer of high professional standing, who acted for many years as Consultant Engineer for the New South Wales Government and inspected all railway material bought in England. Before coming to New South Wales, Mr Whitton had acted as engineer for the Worcester, Oxford and Wolverhampton Railway, and also for the Manchester, Sheffield and Lincoln lines. He was recommended to the British Government for appointment to New South Wales by Sir Moreton Peto, and was appointed Chief Engineer on January 18, 1857, at a salary of £1,500 a year. When he took office there were only 23 miles of line constructed. When he left office on June 30, 1889, there were 2,171 miles of line in working order. Viaducts, bridges, zig-zags, and many other railway works emanated from the brain of John Whitton. By a certain obstinacy, he was able to prevent New South Wales from making costly mistakes in construction work. Only in the matter of a uniform gauge on Australian railways did his uncompromising attitude fail to win success. His efforts for the railways of the colony were never fully appreciated, yet, in the words of the Chief Railway Commissioner, Mr Eddy, “This country would never know how much it was indebted to the genius and pluck of this great man in the pioneer days of our railways.”

The work of Blaxland, Lawson and Wentworth (the explorers), G. W. Evans (the surveyor), William Cox (the road builder), and Lachlan Macquarie (the leader) had been brought to a fuller fruition by the energies and ability of John Whitton and his co-workers. The west was now
linked with the seashore by the latest method of transport of the time.

REFERENCES.
2. Ibid.
9. Ibid, No. 21, and *Votes and Proceedings of the Legislative Council, 1856*.
13. Ibid.
16. Ibid.
19. Ibid, Nos. 27 and 147.

II.

THE GREAT NORTHERN LINE.

The first suggestion for a public railway to the north was made in 1845 by A. W. Scott, who proposed the building of a tramway from Newcastle to Singleton via Maitland at a cost of £350 per mile, but nothing came of it.21

On October 1, 1850, Dr Mitchell of Burwood was granted permission by Act of Parliament to construct a tramway through the land of the Australian Agricultural Company from Merewether (then Burwood) to the waterfront. The partially completed line was taken over in 1853 by the Newcastle Coal and Copper Company. It was opened soon after, and was available to the public for travel under certain conditions.22 Steam locomotives were brought into use on the line.
On April 20, 1853, a meeting was held at the Royal Hotel, George Street, Sydney, with William Charles Wentworth presiding, to discuss the formation of a company to undertake the construction of a railway line in the Hunter Valley. Capital totalling £100,000 was soon forthcoming, and a provisional committee was appointed. Amongst the members of that committee were Charles Kemp (chairman), Charles Nicholson, T. W. Smart, Dr Douglass, W. C. Wentworth and David Jones. On October 10, 1853, a Bill passed through the New South Wales Legislative Council incorporating the company, known as the Hunter River Railway Company, and authorizing it to proceed with the construction of a railway line from Newcastle to West Maitland and beyond, certain financial guarantees being prescribed. By this time, W. C. Wentworth seems to have ceased to have active association with the company.23

The contract for the construction of the first part of the line as far as Hexham was let to Mr William Wright, and on November 11, 1853, Mr Wallace of the Sydney Railway Company was appointed consulting engineer to the company.24 A locomotive was ordered from Fairbairn & Co. of Manchester at a contract price of £2,250, and work began. However, the Hunter River Railway Company found itself in the same difficulty over the depleted labour market through the gold rush as the Sydney Company, and the Government arranged for a supply of workmen from England. The first batch arrived in Newcastle by the Ellenborough on November 5, 1854. On the day previous, the first sod of the section of the line from Newcastle to Hexham was turned at Newcastle by the Chairman of the Company, Mr Kemp, with little ceremony beyond a few cheers. The first locomotive, No. 4N, was landed at Lower Hexham from the Anglia and leased to the contractors, who used it for ballast work. It was assembled by Mr George Wrightson, who had travelled out with it, and he became its first driver. Mr George Callow was fireman.

However, by July 30, 1855, the company was in financial difficulties owing to the inflationary prices following upon the gold rush, and the Colonial Government had to step in and take the work over.

By the end of 1856 the line was more or less finished.25 Nine bridges and nine culverts were erected and the line taken over the tidal flats to the Newcastle terminal at
Merewether Street by a timber viaduct, and on December 27, 1856, a train was run to Maitland in connexion with the Christmas Race Meeting there, although the lines were not officially opened by the Governor-General, Sir William Denison, until March 30, 1857. Approximately 500 people travelled by this train, a stop being made at the Hexham crossing. A reporter of the *Maitland Mercury*, who travelled on the train, noted that all safety regulations were strictly adhered to. This train can claim to be the first Race Special in New South Wales, and probably in Australia.

A regular time-table came into use on March 31, 1857, two trains running each way each day, including Sundays. The times of departure from Newcastle were 7.30 a.m. and 3 p.m., fifty-four minutes being allowed for the journey, which included a stop at Hexham, the only other station on the line. Fares were 2/3 first class and 1/6 second class to Hexham, and 5/6 and 2/9 to Maitland. Unlike the Sydney Railway, there was no third class travel. Before the opening of the railway, the normal time for a journey by coach from Newcastle to Maitland was about five hours.

On a visit to inspect progress on this line in December, 1856, the Chief Engineer of Government Railways, Mr John Whitton, had drawn attention to the bad site selected for the Newcastle Station, and had urged that work on an extension into the centre of the town should be undertaken as soon as possible. Work was pushed ahead on this extension as soon as the line was opened, so that passengers could be carried into the town and goods to Circular Wharf. This involved a slight diversion of the line and the construction of a shallow cutting to pass at a suitable point under the A.A. Company's bridge, until 1862, when a new bridge, considerably higher, was opened.

With this section of the Great Northern Railway open and in use, it was not long before extensions were made. On July 27, 1858, the line from East Maitland to West Maitland, a distance of 2 miles 67 chains, was opened—a costly task, which involved building three new stations (High Street, East Maitland and West Maitland), bridges, level crossings and the like. The opening of this line by Sir William Denison was the occasion of great festivity. Triumphant arches, bands, speeches, levees, free travel, illuminations and fireworks were the order of the day.
On July 2, 1860, an extension of seven miles to Lochinvar was opened, and on March 2, 1862, to Branxton, eight miles further up the Valley. By May 7, 1863, the line was open as far as Singleton, a further fourteen miles. A branch line was also established from East Maitland to Queen’s Wharf, Morpeth, on May 2, 1864, to cater for the needs of steamers which at that time made Morpeth their terminus on the Hunter River. Here cargo and produce from the farms in the Valley were loaded rather than at Newcastle. Thus, by 1864 fifty-two miles of railway line had been laid at a cost of approximately £748,000, of which £43,000 was paid for land resumption.\(^29\)

Railway workshops with a few simple machines were established at Newcastle early, power being provided by a 10-horsepower engine. This equipment was added to and enlarged from time to time, and, until the opening of the Hawkesbury River Railway Bridge in 1889, all repairs to locomotives and rolling stock were carried out there.

In the meantime the line was creeping steadily north, and by April 5, 1872, the seventy-mile section from Singleton to Murrurundi had been completed and opened.\(^30\) To cross the Hunter River at Singleton, a bridge 523 feet in length was erected by Messrs Hughes & Goddard in 1866. It is now used as a road bridge, as a new railway bridge was erected in 1902. The new part of the line passed through Wingen, close to the Burning Mountain, still active in these days. Before railway engineers now lay the barrier of the Liverpool Range, which had hemmed in the early settlers of the Hunter Valley until Henry Dangar had found a way over in 1824. However, this difficulty was overcome by the construction of a tunnel 1,599 feet in length, known as the Ardglen Tunnel, at a point six miles from Murrurundi. It is the oldest railway tunnel now in use in New South Wales, the six older ones having gone into disuse.\(^31\) The section from Murrurundi to Quirindi (or Quirindie as it was then spelt) was opened on August 13, 1877. By the next year, 1878, the line had reached West Tamworth, and a branch line from Werris Creek (or Werries Creek as it appeared on early maps) to the north-west was under construction. By February 3, 1883, the line was open to Armidale, and on the following year by August 18 to Glen Innes. The last section, to Tenterfield, was opened on September 1, 1886. This was
the northern terminus until a link was made with the Queensland railway system on January 16, 1888. The daily all-stops train running from Newcastle to Murrurundi at this time took 5½ hours. The present running time for this run by a similar train is 5 hours, while the Northern Tablelands Express takes 3½ hours.

Until the opening of the Hawkesbury River Railway Bridge, there were two separate railway systems working in New South Wales, both under Government control. One, centred in Sydney, dealt with the southern and western traffic, and the other, centred in Newcastle, dealt with the northern traffic. To reach the Newcastle rail terminal and provide a link between the systems, steamers of the Hunter River New Steam Navigation Company and the Newcastle Steamship Company operated from Sydney. The best vessels of these companies took three hours to travel from the North Head of Port Jackson to Nobby’s Head, a distance of 60 miles. Fares were 7/6 single and 12/6 return for saloon passengers (first class), and 4/6 single and 7/6 return steerage (second class). Ships left Sydney at 11.30 p.m. daily, and arrived at Newcastle in the early hours of the morning to connect with the northern line train. The return journey to Sydney began at 2.30 a.m.

As the Hawkesbury River remained the only barrier preventing the linking up of the two railway systems, in December, 1875, John Whitton, Chief Engineer of the Railways, undertook to have surveys made of possible routes between the two railway systems. As a result, he suggested a line from Parramatta to Wiseman’s Ferry and across the river there to link up with the northern line at either Maitland or Singleton. However, this line would have been too costly, and nothing came of it. Further surveys were made three years later, and from these, in 1883, a definite route was chosen, and it was confirmed by a parliamentary vote of nearly £2,000,000. This line was from Redmyre (Strathfield) to Brooklyn on the Hawkesbury, from there to Long Island by a causeway, over the river to the northern bank at this point, through Gosford, junctioning at either Hexham or Hamilton, thus by-passing Newcastle. Hamilton was eventually chosen as the junction.

When a rail extension from Hamilton to Gosford was opened on August 15, 1887, an alternate route was possible.
A line from Strathfield to Brooklyn on the Hawkesbury River was then open, and passengers from the train were taken by the ferry, General Gordon, from Long Island to Gosford, a journey of 14 miles by water. The time-table for this route was as follows:

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<th>Dep.</th>
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<tr>
<td>Sydney</td>
<td>8:15 a.m.</td>
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<tr>
<td>Brooklyn</td>
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<td>10:25 a.m.</td>
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<tr>
<td>Brooklyn (by ferry)</td>
<td>10:45 a.m.</td>
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<tr>
<td>Gosford (by ferry)</td>
<td>12:30 p.m.</td>
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<tr>
<td>Gosford (by train)</td>
<td>1:30 p.m.</td>
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<tr>
<td>Newcastle</td>
<td>5:15 p.m.</td>
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For lovers of the sea, the steamers Gosford and Charlotte Fenwick left King Street Wharf, Sydney, daily at 8:30 a.m. and No. 4 Jetty at 9 a.m. for the journey direct to Gosford, arriving there at noon. Fares were 4/- single and 6/- return. On the return trip, the steamers left Gosford at 2 p.m.

Tenders were called for a bridge from Long Island to the northern bank across the Hawkesbury River, a distance of nearly 3,000 feet. The tender of the Union Bridge Company of New York was confirmed on May 4, 1886, with certain modifications, at a contract price of £340,000. There were to be seven spans, each of 410½ feet, and the bridge was to be 40 feet above high water mark.

In accordance with the selected route, contracts were let for the construction of the lines. The first work was the building of the line from Redmyre (Strathfield) to the Hawkesbury, begun in 1883 by Amos & Co. It was opened as far as Hornsby on September 17, 1886, and to Brooklyn on April 7, 1887. The line from Hamilton to Gosford, also built by Amos & Co., was opened on August 15, 1887, and extended by George Blunt & Co. to the northern abutment of the bridge. Portion of this extension to a temporary Mullet Creek Station was opened on January 16, 1888, the same day as the extension from Tenterfield to Wallangara, thus linking up with Queensland. This shortened the length of the journey by water to Brooklyn, and the ferry, General Gordon, was switched from the Gosford run to this. This last named section of the line includes the Woy Woy Tunnel, 5,871 feet long, the longest railway tunnel in New South Wales. It is worthy of note that bridges and tunnels on this section were constructed to allow for double tracks, as it had been planned originally to duplicate the section from Strathfield to Waratah.
However, this duplication did not take place until the turn of the century.

Work on the Hawkesbury Bridge, the final link, was begun on December 9, 1886, with No. 5 pier. The caissons were completed by October 9, 1888, the deepest being 162 feet below high water mark. Dangar Island was chosen as the site for the assembling of the spans, which were then floated to the piers by pontoon at high tide and lowered into position as the tide fell. For this delicate task, both tide and wind would have to be most favourable. The first span was set in place on May 25, 1888, and the last on March 1, 1889. Unexpected southerlies played havoc at times with the placing of these spans in position, so much so that one span was 180° out of place; and one flood carried the pontoon out to sea, fortunately after the bridge had been completed. Track laying was completed on April 23, 1889, and the bridge was tested on the following day. Two trains, each of 450 tons, were run on to the structure, and the result was satisfactory. The bridge was finally opened by the Governor, Lord Carrington, on May 1, 1889, being the final railway link joining the railways of Queensland with those of South Australia.

Without waiting for the completion of the bridge, plans had been made to link up the capital cities of Sydney and Brisbane. On March 5, 1878, Mr Whitton discussed with Mr Stanley, his counterpart in Queensland, the possibility of linking the two railway systems at the New England border. This was completed, and on March 5, 1878, Mr Stanley reported that it was possible that another point of junction might have to be agreed to. Two months later, Queensland proposed two routes from Stanthorpe, the then terminus of the Queensland line—one terminating at the head of Macnamara’s Creek, 15 miles from Tenterfield, and the other terminating at the intersection of the Ballandoon Road with the border, 12 miles from Tenterfield. The latter was recommended as the shortest and best route, and was adopted. The Sydney Morning Herald of March 11, 1886, reported that Sir Patrick Jennings, the Premier, had telegraphed the Queensland Premier to allow the break of gauge at Tenterfield instead of at the border. But as the preliminary work had gone so far, it was not agreed to.

With the opening of the Mullet Creek–Gosford section of the line, and that from Tenterfield to the border at
Wallangara on January 16, 1888, the first train to Queensland, the “Northern Mail,” was run. The time-table for the journey showed a total travelling time of 36 hours 22 minutes. The train left Sydney at 4.53 p.m. on January 16, and passengers arrived in Brisbane at 6.15 p.m. on January 18, having changed into a Queensland train on the smaller 3 ft. 6 ins. gauge at Wallangara. Newcastle was reached in 5 hours 42 minutes, an improvement on the previous 9 hours, and the border station after 24 hours’ travelling.38

A special reporter of the Sydney Morning Herald travelled in the first Northern Mail, and later set down his impressions of the journey in that newspaper. He was a little surprised at the absence of any official ceremony or speeches to mark the event. Sleeping cars, he recorded, were added to the train at Hamilton, and the journey up the beautiful Hunter Valley took place in darkness. Very early next morning a stop was made at Werris Creek, of which station he wrote, “The costly brick buildings and enormous refreshment rooms serve as a monumental record of our extravagant railway expenditure.” The sleeping cars were taken off the train at West Tamworth at the early hour of seven o’clock, much to the annoyance of sleeping passengers, who had to transfer themselves and their possessions to other carriages. Lovely scenery was encountered in the run from Tamworth to Glen Innes. Many passengers broke the journey at Tenterfield, where excellent accommodation was available at the hotels. The station buildings at Tenterfield, he thought, were elaborate and costly. Of the rest of the journey he made no comment.39

The citizens of Newcastle were perturbed about the by-passing of Newcastle with the northern line, which they saw as a threat to the trade from the north to their port. They felt that the produce from the pastoral and agricultural areas would now be taken through to Sydney. Also, they saw in the arrangement of the time-table an effort to kill the steamship passenger traffic to Newcastle, as the steamer times could not fit in with the new train times. A protest meeting was held in front of Buchanan’s Hotel on January 19, 1888, the Mayor presiding. ‘Resolutions of protest to be forwarded to the responsible Minister were laid before the gathering and carried with acclamation, but to no avail.40
In 1900, traffic on the Northern Mail was eased by the introduction of the North-West Mail, which carried passengers from Sydney up the branch line from Werris Creek. This line had been opened to Gunnedah in 1879, and to Narrabri in 1882. Just before the introduction of the North-West Mail, it had been extended to Moree (April 1, 1897).

This section from Narrabri to Moree was one of the pioneer or light lines laid in the 1880's, when financial difficulties were worrying the colony and money was scarce. The lines were laid with light 60 lb. rails and rounded sleepers set in 9 to 18 inches of ballast, usually earth, and they were unfenced. It cost about half of what a heavy line would cost per mile. Similar lines were laid in other parts of the colony—from Parkes to Condobolin and from Jerilderie to Berrigan.41

With the turn of the century, the Railway Commissioners decided to push ahead with the duplication of main lines, but wars and other troubles did not allow the work to go ahead as planned. A writer in the Railway Historical Society's Bulletin said of the northern line:—

The vigorous duplication policy of the early 1900's had Werris Creek as an objective, but the additional track had only been laid between Maitland and Branxton when World War I. caused the work to be suspended in 1915. At this stage, the earthworks and bridge widening had been completed to Singleton and the actual track had been laid nearly to Minimbah, 6½ miles beyond Branxton, but the steel in the disused portion was used for more urgent work from time to time.

The duplication was continued after World War II., and was completed as far as Singleton on October 16, 1951.42 Further work is in progress. Of this section of the line, it is interesting to note that main line points and signals at Belford are remotely controlled from the signal box at Branxton, 4½ miles away, the first example of this system in New South Wales.

In 1937, after nearly fifty years of constant use, a crack appeared in No. 4 pier of the Hawkesbury River Bridge. A departmental inspection showed that replacement would soon be necessary. Train speeds across the bridge were first reduced to ten miles per hour and later to four miles per hour. Only one train was allowed on the bridge at a time. Plans were prepared at the same time for a new bridge, which was to be a short distance upstream from the old one. Work was begun soon after,
and a bridge 2,764 feet in length, consisting of eight spans of various lengths, the longest pair being 445 ft. 8 ins. in length, designed, fabricated, and erected by the Railway Department, was constructed. On July 1, 1946, the last train passed over the old bridge. It carried the official party for the opening of the new bridge, and returned later across the new structure. The new bridge was opened by the Hon. W. J. McKell, then Premier of New South Wales. The work of dismantling the old bridge began on July 10, 1946, and was completed towards the end of 1948.43

THE TWO HAWKESBURY RIVER BRIDGES.

Modern air-conditioned daylight expresses made their first appearance on the northern line when they replaced the former rolling stock of the “Newcastle Flier” on April 30, 1948. Two of these trains now provide three express services each way each day from Newcastle to Sydney. The permanent way between the Hawkesbury and Newcastle is at present being strengthened to permit faster travel in the near future. A similar type of train to the “Flier,” the Northern Tablelands Express, made its first
journey to Armidale on April 9, 1951. To-day, two of these trains provide a service each way every week-day.44

The Great Northern Line continued to serve the Hunter Valley and the New England districts and to provide the main line service to Queensland from January 16, 1888, until September 27, 1930, when an alternative route, all in the one gauge—4 ft. 8½ ins.—was opened through the Northern Rivers district to South Brisbane. Although still a large amount of traffic is carried from the New England districts to Queensland by it, it has largely become a district line serving the population in the Hunter Valley, on the Liverpool Plains and the New England Tablelands.

Because of the number of occasions on which coal deliveries to Sydney have been delayed through floods on the Maitland section of the main line, trial surveys and plans have been made to have an all-weather coal route. From Weston on the South Maitland private railway, it would go to Minmi Junction on the J. & A. Brown Co. line. Then a double-track line would be laid from there to Co-operative Junction on the Newcastle–Wallsend Coal Co.'s line, after which it would travel by that line to Hanbury Junction on the main north line between Waratah and Sandgate.

**THE NORTH COAST LINE.45**

The North Coast Line began as an isolated section of the New South Wales Government Railways when the portion from Lismore to Murwillumbah was opened on December 24, 1894, with Byron Bay as a port of shipment. It was extended to Casino in 1903. An extension of the line from Casino to Grafton was begun soon after, and was opened to the public on November 6, 1905. Most of the passenger traffic and produce of the district was catered for by those steamship companies whose vessels ran regular services between Sydney, Newcastle, and ports on the Northern Rivers. A proposal to link up the district with Newcastle by rail was considered by the Parliamentary Standing Committee for Public Works in 1898, but it was not recommended, and sums of money were voted for harbour improvements instead, as it was felt by the Committee that the shipping services and the railway then in operation were quite adequate for the needs of the district. But by 1904 the attitude of the Committee had changed. Perhaps the need for constant harbour work had led them
to the decision that a railway would be cheaper in the long run. But some years elapsed before further extensions were made, and it was 1910 before the section from Casino to Kyogle was opened.

The first section from the Newcastle end, from West Maitland to Dungog, was opened on August 14, 1911, but owing to World War I, the work was interrupted, the final section from Macksville to Uranga not being opened until December, 1923. Even so, it is not quite correct to say that the line was completed, for there was not any railway bridge over the Clarence River at Grafton. For seven and a half years—from October, 1924, until May, 1932—trains were ferried across the river between the South Grafton and Grafton Stations. The Railway Department designed a bridge to span the river at this point; however, they were approached by the Public Works Department to alter it to a dual duty bridge, that is, to have a road crossing at a higher level while the trains crossed below. The Public Works Department agreed to pay the additional cost, and the design was changed. The bridge, fabricated by the Clyde Engineering Company and erected by the Railway Department, was opened on May 8, 1932. One of its spans has a bascule opening, i.e., it can be raised by swinging up from one end to allow river traffic to pass through.

The erection of the Clarence River Bridge was linked with the task of constructing a line through to Brisbane, all of 4 ft. 8 1/2 ins. gauge.

A discussion of experts in railway matters had met together as a Royal Commission in 1921 to discuss the question of the unification of railway gauges in Australia. As it was realized that complete unification was financially impossible, certain plans were suggested to overcome the greatest of the difficulties which variation of gauges brought about. One of these was the extension of the New South Wales line from Kyogle over the border to South Brisbane. When opened on September 27, 1930, this avoided a change of trains at the Queensland–New South Wales border, as well as providing a shorter line than the previous line via Wallangara.

To overcome the rise over the higher land at the border, a loop was constructed—the first example of this method of climbing used in New South Wales. The double loop at the Kicking Horse Pass on the Canadian Pacific...
Railway is probably the best known example of it elsewhere. The Border loop has two tunnels, a longer one of 630 feet and a shorter one of 580 feet. The gradient on the loop is a comparatively easy one—1 in 66—and the difference in height of the two lines at the point where they pass one another is 65 feet. About two miles further north is Border Tunnel, 3,807 feet in length, the longest single-track tunnel in the State. This statement, however, is not strictly correct, as the border between the States passes across the tunnel at a point 1,660 feet from the entrance, so that the greater part of the tunnel is in Queensland!

In the future, it is hoped that the use of Diesel electric locomotives to haul the Brisbane Express will reduce its running time to 16 hours—something our grandparents who travelled by the early northern mail trains, which took over 36 hours to reach Brisbane, would find hard to realize. On June 15, 1952, two Alco Diesel electric locomotives hauled the Brisbane Limited Express on a special trial run. They left Sydney at the usual time of 6.30 p.m. and arrived at South Brisbane at 10.25 a.m. the next day, i.e., three hours earlier than the usual time of arrival of this express. As more Garratt & Baldwin locomotives become available, these Diesel electric locomotives will be switched to such main line passenger work.

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22 From the Records of the Railway Department, Sydney.
25 Newcastle and Hunter River Historical Society Journal and Proceedings, Vol. III., p. 75. This loco. was renumbered 391 in 1889; it was scrapped in 1892.
26 Origin and Progress of Railways in New South Wales, 1846-1864.
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The Story of the N.S.W. Railways.

THE ILLAWARRA RAILWAY LINE.

In the early 'seventies, a committee of prominent citizens was formed to urge upon the Government the need for a railway line from Sydney to the Illawarra District. It was felt that the time was opportune for suggesting a railway to Illawarra to tap and develop the mineral and agricultural potentialities of the district.

The committee formed in Sydney to urge the line upon the Government was headed by Mr James Manning, whose family had been granted 1,000 acres of land called Bonairi at Kiama, south of the township, on August 23, 1839. He was so keenly interested that he went to the trouble of having maps drawn suggesting possible routes from Sydney and Campbelltown along which the railway could be constructed. Mr (later Sir) Henry Parkes, M.P. for Kiama from 1864 to 1870, was also interested and sympathetic. A third supporter was the Rev. John
Dunmore Lang; he had been granted land on the shore of Lake Illawarra, but the grant had passed to his brother Andrew.

In 1873 a deputation had waited upon certain members of the Government, and the matter was brought up in Parliament. Generally, it was sympathetically received, and Mr Parkes ordered a trial survey to be made. This was begun in the same year by Railway Surveyor R. D. Stephens. However, the opposition outside Parliament was more vociferous, and came from north, south and west of the colony, particularly from the Newcastle area, where, no doubt, coal interests were not too happy about the entry of another group of competitors into the Sydney market, of which they had had for long years a virtual monopoly. Also, the people there felt that the junction of the two railway systems centred on Sydney and Newcastle was a more important matter.

A public meeting was called at the Masonic Hall in Sydney in 1875. The Rev. J. D. Lang argued that the line would provide Sydney people with a supply of good coal at prices probably cheaper than those of the Newcastle collieries. It would also bring a welcome supply of vegetables and dairy produce from the rich agricultural lands of Illawarra. Thirdly, it would open up an easy method of access for the people of Sydney to the beauties of the South Coast, which few were able to enjoy at the time. He felt that, with the passenger and freight traffic which would be available, it would undoubtedly be a paying line. He estimated that the line could be built to the Illawarra at a cost of £740,000. (Actually it cost nearly two million pounds.)

As a result of the meeting, a deputation was appointed to make a further approach to the Government and urge upon them the construction of the line. But, although the matter was fully debated in Parliament in the early part of 1876, the line was not authorized. Even Mr Parkes spoke against it owing to the expense it would involve.

Five years later, however, it was approved, when, on April 6, 1881, the *Public Works Act* (44 Vic. 28) authorizing the raising of a loan of £1,020,000 to build a line from Sydney to Kiama, a distance of 68 miles, received the Royal Assent and tenders were called. In the parliamentary debate on the loan, there was still evidence of some strong opposition
to an Illawarra railway line. The expenditure of nearly £200,000 on improving harbour works at Wollongong some time before, and the facilities for sea travel, were put forward as reasons against the line. Some members could not see in what way conditions had changed since 1876 to justify the Government going to the expense of building a line at a cost of over £1,000,000 which it had previously negatived. One member, Mr H. C. Dangar, spoke against the loan on the grounds of lack of extensive enough agricultural production and the smallness of population. He moved an amendment that the line should stop at the George's River, and thus become a purely suburban line. But it was obvious that many members who had previously opposed the erection of the line were now in favour of it. Henry Parkes was noticeable in this group, and answered the criticism of the loan's opponents in his typical style. No doubt, too, the authorization of the line linking Newcastle with Sydney had dissolved the opposition in that direction. Mr Dangar's amendment was lost, and the loan received approval of the House.

Construction began in 1882, but the most difficult section, the descent from Waterfall to Coaleiff, was not tackled until 1885. This involved a ruling grade of 1 in 40, with seven tunnels—Waterfall, 725 feet; Cawley's, 1,256 feet; Helenburgh, 264 feet; Metropolitan, 2,064 feet; Lilyvale No. 1, 264 feet; Lilyvale No. 2, 1,056 feet; and the Otford Tunnel, 5,083 feet. Even after the coast had been reached, a further tunnel 3,279 feet in length was necessary at Coaleiff.

The first part of the line, a double track from Sydney to Hurstville, was opened on October 15, 1884; the second part of the line, from Hurstville to Loftus (now Loftus Junction), on December 26, 1885; and the Sutherland to Waterfall section, and a branch line from Loftus Junction into National Park, on March 9, 1886. In the following year, 1887, the section of the line from Wollongong to Clifton (called Scarborough since 1916) was opened. About two thousand children of the district were presented with medals struck in honour of the occasion.

A road coach service was inaugurated temporarily between Clifton and Waterfall to enable through travel to Sydney. The time-table of October 1, 1887, shows a travelling time of 45 minutes from Clifton to Wollongong,
while for those passengers travelling from Sydney a train left Redfern at 8.22 a.m. and passengers arrived at Wollongong at 1.15 p.m., after having transferred to road coaches as mentioned above. To-day, an all-stations train still takes about 42 minutes to do the trip from Clifton (Scarborough) to Wollongong, while the through journey from Sydney by the South Coast Daylight Express takes just over three hours’ shorter time.

The Wollongong to Kiama section was the next to be opened, and a line to North Kiama was put into public use on November 9, 1887.

The most southerly section of the line, that from North Kiama (Bombo) to Nowra (Bomaderry), was opened on June 3, 1893, a section which required the construction of five tunnels of an average length of 1,000 feet, the first of which, 1,546 feet long, went through a ridge into Kiama township.

In the meanwhile, the difficult section, that from Waterfall to Clifton, was completed and opened to the public on October 8, 1888. This event, allowing the first through rail traffic from Sydney, was made the occasion of great festivities in both Wollongong and Kiama.

The section from Waterfall to Scarborough has always been troublesome to maintain during wet weather, owing to the steep nature of the country and the many patches of soft and “greasy” soil on rocky hillsides. A red cutting south of Otford has the unpleasant knack of squeezing out stones of various sizes, which either break windows of passing trains or bury the track. The Stanwell Park deviation had an enviable record in the matter of landslides, the line being closed on one occasion for several days through a heavy fall.

Another point of trouble was the narrow ledge between Coalecliff Tunnel and Scarborough old station, which, owing to the sloping rock under the ledge, has a bad record for landslides, the original railway having had several adjustments necessary since the line opened. The construction of the earthworks for the line cut through the clay bands protecting the rock carrying the ledge, and there was at one time a grave danger of the whole of the village of Clifton being pushed over the cliff into the sea. The railway reply to the threat was to construct a system of brick galleries and culverts to carry off the water falling down the hillside in heavy rain causing seepage. These
culverts must be constantly kept clean, as sudden heavy rain will still bring about the danger of landslide if this is not done.

When the extension of the line from North Kiama to Nowra was under weigh, the Colonial Secretary received representations from the people of Nowra to have the line taken into the township. The planned terminus, Bomaderry, was one and a half miles away. Borings were taken with a view to building a bridge cross the Shoalhaven River to accomplish this, but it was found that a foundation could not be obtained under 160 feet in the best locality, while at another site a little higher up the depth was still 85 feet. The Railway Commissioners were not in favour of the costly bridge work, and the Parliamentary Committee for Public Works reported on March 18, 1890, that they did not recommend that the line should be taken into Nowra. It was to stop on the northern bank of the river, and so no premature bridge work would be undertaken in case the line should eventually be extended to Jervis Bay, as had been suggested. A temporary deviation was planned (but never carried out) from the main line to the northern end of the road bridge, which would have taken the line to within one mile of the centre of the town.47

On April 21, 1891, the same Committee reported that it had considered the matter again, and suggested that the line be extended one and a half miles to the township.

Years later, in 1907, the Clyde Shire Council revived the idea by suggesting that a light line or tramway be constructed from Bomaderry to the highway bridge, crossing it and proceeding via the main road, Berry Street, to Anne Street, and on to Huskisson. But again nothing came of it.

Beginning in the early months of 1890, a vigorous policy of duplication of the Illawarra line was being pursued, and a double track was opened as far as Oatley on April 4, 1890, and to Waterfall, except for the Como Bridge, by March 22, 1891. There the duplication stopped because of the heavy work it would involve in the section to Coalcliff, where all tunnels were built for a single track only. The full duplication to Wollongong was not completed and opened until May 27, 1923.48

In 1884, Parliament made preliminary provision for
a line costing £804,000 to be built from Kiama to Jervis Bay, via Broughton Creek and Nowra, the first of several attempts to provide railway communication for Jervis Bay. Plans of the proposed line were laid before the House, but nothing was done except that, as mentioned before, the section from North Kiama to Nowra was opened in 1893.49

Again, in 1908, the Parliamentary Committee for Public Works considered the extension from Nowra to Jervis Bay, the suggestion this time being for a tramway. But the Committee felt that if anything was to be constructed it should be a railway, and the matter lapsed again.

In 1911 it was again revived, and a railway was considered, but, owing to the uncertainty of the plans of the Federal Government over its territory at Jervis Bay, the matter was left in abeyance. In 1913 a final attempt was made to have the line extended to Captain’s Point at Jervis Bay, but the Committee negatived the idea. Throughout all the discussions, it was obvious that the cost of constructing a bridge over the Shoalhaven River was the principal obstacle.

The Unanderra-Moss Vale line, opened in August, 1932, was built to serve the needs of the Port Kembla Steelworks. It is a very picturesque line, climbing slowly up the mountain face from an elevation of 45 feet above sea level at Unanderra to 2,101 feet at Mount Murray.

There have been deviations of the main line in three localities. The first was at Oatley, and was opened on July 7, 1905. Below Oatley and up to Mortdale, the line from the Como Bridge used to rise with a steady 1 in 60 gradient, which was not an easy one for heavy coal trains. The deviation, though a little longer, eased the gradient to 1 in 80, and allowed larger loads. A new station on another site at Oatley was needed, and the old railway course has become a lovely little park. The old cuttings at Mortdale and south of Oatley are still clearly visible.

Two major deviations have been made on the section of the line between Waterfall and Coalcliff. In 1891, the Parliamentary Committee for Public Works reported that the combination of the steep grade at the southern ends of the Otford Tunnel and the steady pull up through this single-track 77-chain tunnel itself had caused great discomfort to the train crews because of the accumulation of gases and fumes. Men were known to have been
sealed by the steam. It was planned that a ventilating shaft seven feet in diameter should be constructed on the site of an old working shaft in the roof of the tunnel to provide an escape for smoke and fumes. The original shaft had been sunk so that work could be carried out on four faces, one at each end of the tunnel and in the two opposite directions at the foot of the shaft. It also enabled a pilot tunnel to be driven to ensure that the direction of the drilling was correct. The tender for re-opening and reconstructing this shaft was let to Mr Macdonald at a price of £1,160, and work proceeded at once.

However, the shaft was not the success it was hoped, and the method of ventilation known as the Saccardo system was introduced in 1909. An engine house was erected on the up-side of the tunnel at the Sydney end, consisting of a suction gas producer room and an engine room. A Sirroco fan of 105 inches diameter was set up, and the air it produced passed along a duct leading to the tunnel mouth. The fan produced a 15-knot breeze, and the contents of the tunnel were changed every three minutes. On days when a strong southerly was blowing, the fans were not used, as the breeze neutralized the ventilation, and the position was as bad as ever. The gas producer unit was replaced in 1915 by a steam-driven plant, and compressed air for deviation work was later supplied by the steam engine.

But still the gradient and a single-track line which did not allow duplication owing to its seven tunnels were a hindrance to the increasing traffic of the line. The Public Works Committee discussed the question of a deviation, and in November, 1909, a new line of route from Waterfall to Otford was approved and commenced, while in February, 1915, a new line from Otford to Coaleliff to avoid the Otford tunnel was approved.

The first portion of the deviation ready from South Waterfall to Helensburgh temporary junction was opened for use on February 27, 1914. The section, Waterfall to South Waterfall, was delayed by the big task of opening up the Waterfall Tunnel, and was not opened until August 17, 1914. Another section, from the temporary junction to Lilyvale, was opened on May 30, 1915. The final section of the deviation from Otford to Coaleliff had to wait until World War I. was over, and was not opened until October
10, 1920, although up goods trains had been using the line since the previous August 3.

The gradient of the deviation is a much easier one, 1 in 80 instead of 1 in 40, but the line is now 3 miles 6 chains longer than the old route. The new tunnel through the range, to the Bald Hill Tunnel, is only 19\(\frac{1}{4}\) chains long (1,269\(\frac{1}{2}\) feet). As the train passes south out of the Bald Hill Tunnel, the passenger is greeted by an expanse of land and sea unparalleled in Australia. The suddenness of it makes it all the more breath-taking.

As in the case of the Blue Mountains line, the Department of Main Roads has used the old railway construction for a road, and from Stanwell Park through the old cutting on Sea Bank to Coalecliff quite a distance is travelled along the old line. The site of the old Stanwell Park station, opened in 1890 as a picnic platform, can be recognized as at the overhead footbridge across the main road below the location of the present station. On the descent by train from Waterfall to Stanwell Park, it is easy to catch glimpses of the earthworks of the old line.

It may be of interest to record the changes of names of certain railway stations on the Illawarra line since its inception. From the Sydney end, these stations and their older names are:

<table>
<thead>
<tr>
<th>Old Name</th>
<th>New Name</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydenham-Marrickville</td>
<td></td>
<td>1895</td>
</tr>
<tr>
<td>Oatley-Oatley's</td>
<td></td>
<td>1905</td>
</tr>
<tr>
<td>Loftus-Loftus Junction</td>
<td></td>
<td>1896</td>
</tr>
<tr>
<td>The National Park-Loftus</td>
<td></td>
<td>1896</td>
</tr>
<tr>
<td>Scarborough-Clifton</td>
<td></td>
<td>1915</td>
</tr>
<tr>
<td>Thirroul-Robinsville</td>
<td></td>
<td>1891</td>
</tr>
<tr>
<td>Balgownie-Para Meadow</td>
<td></td>
<td>1909</td>
</tr>
<tr>
<td>Yallah-Albion Park</td>
<td></td>
<td>1888</td>
</tr>
<tr>
<td>Albion Park-Oat Flats</td>
<td></td>
<td>1888</td>
</tr>
<tr>
<td>Bombo-North Kiama</td>
<td></td>
<td>1907</td>
</tr>
<tr>
<td>Toolijooa-Toolejooa</td>
<td></td>
<td>1897</td>
</tr>
</tbody>
</table>

The present Oak Flats Station was opened in 1890. A North Clifton Station was opened in 1888, and was renamed Clifton in 1889; it was closed at the duplication of the line in 1915. South Clifton Station was opened in 1888, and was renamed Scarborough in 1903, but was dismantled when a new Clifton Station on a site nearer to Sydney was opened. This new station was re-named Scarborough almost immediately after opening.

The Illawarra Line has several claims to distinction. The shortest tunnel in the State, Shellharbour Tunnel of
132 feet, is on the line. The old Otford Tunnel was the longest single-track tunnel in the State and the second longest of any tunnels; it was 5,083 feet, or 77 chains. The only examples of tunnels being opened up into cuttings occur on this line—the Waterfall Tunnel, 725 feet, south of Waterfall, and one 197 feet at Forest Road, Arncliffe.

The Como Bridge over the George’s River is the only gauntlet track bridge in Australia. In a gauntlet track, the double tracks are restricted to a little more than the width of a single track, the two sets of rails being only about eight inches apart. This makes it possible to use a single track bridge without the points that purely single track bridges would need. This bridge, by the way, was fabricated by Cochrane & Co. and the Stockton Forge Co., and cost £18,732 to land in Sydney. The new Stanwell Park Bridge is a fine example of a large brick curved viaduct, and required five and a half million bricks to build. The height of the track on the viaduct is 127 feet, about the same height as the famous Lapstone Viaduct.

The first electrified line in New South Wales was opened on the Illawarra Line, between Sydney and Oatley, on March 1, 1926. Cronulla, on the branch from the main Illawarra Line, has the second longest passenger platform in the State, 1,275 feet in length. (Albury, 1,510 feet, is the longest.) This line also has a station probably unique in the Commonwealth in that it has two names—Nowra and Bomaderry. Finally, it also has one of the new daylight air-conditioned expresses, the South Coast Express, in regular use, the first journey having been made on November 20, 1949.

The story of the Illawarra Railway Line shows the perseverance of the pioneers in fighting to have the line built and the technical skill of the engineering section of the railways in building it. Neither had an easy task. Even after it had been opened, the Illawarra Line was the Cinderella of all lines. Since then, with the development at Port Kembla and Wollongong, it has become a major route and has justified its construction over and over again. The nature of the country through which the line passes made the construction of it a very big task, as the reports of the early surveyors show. The necessary funds for doing the work to the best possible advantage were not fully forthcoming, double-track at the outset being dis-
allowed, and, frustrated by such restriction, Chief Engineer Whitton and his staff deserve every credit for what they did.

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48 Australian Railways and Locomotive Historical Society’s Bulletin, No. 102, p. 51.

Note.

By JAMES JERVIS, A.S.T.C. (Fellow).

The traveller from Sydney to Windsor in these days of speedy transport may perform the return journey in about an hour and a half. A century and a half ago travel was much slower. In this connexion, a paragraph from the Sydney Gazette of August 21, 1803, is of interest:

Last week an open boat arrived from the Hawkesbury with 60 bushels of cob corn aboard, for which she went purposely from Sydney and performed the journey in 17 days. She measures only 12 foot keel, shipped a temporary mast and sail, and had two men aboard, who rowed one-third of the distance. This plan of conveyance was adopted to save the expense of carriage, which would have amounted to Twenty Shillings, but how far they succeeded in this aim we leave others to determine, as at the rate of five shillings per diem for each Man’s hire, exclusive of that of the boat, will amount to double the freight.

It should be pointed out that boats to the Hawkesbury did not usually take seventeen days for the return journey.

Book Reviews.

COCKATOOS, by Brent of Bin Bin. (Angus & Robertson. Aust.16/-.)

Cockatoos is another novel of the Brent of Bin Bin saga. It covers the years 1899 to 1906, fitting into the series after Up the Country (1852-69) and Ten Creeks Run (1888-95). Brent takes up the lives of some impoverished members of the station families of Up the Country and Ten Creeks Run, who have become small farmers at Oswald’s Ridges, near Goulburn. She describes the barren drudgery of their lives. They scratch about like cockatoos in order to make a miserable living, for their land—the gullies and