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ADELAIDE TRAMWAY CENTENARY

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FRONT COVER: *During a trial run with horse-car 18 in King William Street, Adelaide on Sunday 21 May 1978, the opportunity was taken to photograph a line up of the various cars to be used in the Centenary procession. Seen here in Angas Street outside City Depot are 18, A1, F282, G303, H369 and H1 381. The H did not run in the procession being replaced by a three car set.* - J.C.Radcliffe

Comment . . .

Trams have returned to Adelaide! Although they never entirely left, the routine efficient operation of the Glenelg Line was taken for granted by its users and forgotten by others, being overshadowed by the more visible (and audible) recently enlarged STA bus operations The operation of the AETM trams on the Glenelg line during June made a visual impact and drew extremely favourable media coverage which has created the climate for a northward extension of the Glenelg line through the city and the adoption of a tramway as the transport mode for the much proposed and discussed Modbury Corridor to Tea Tree Plaza.

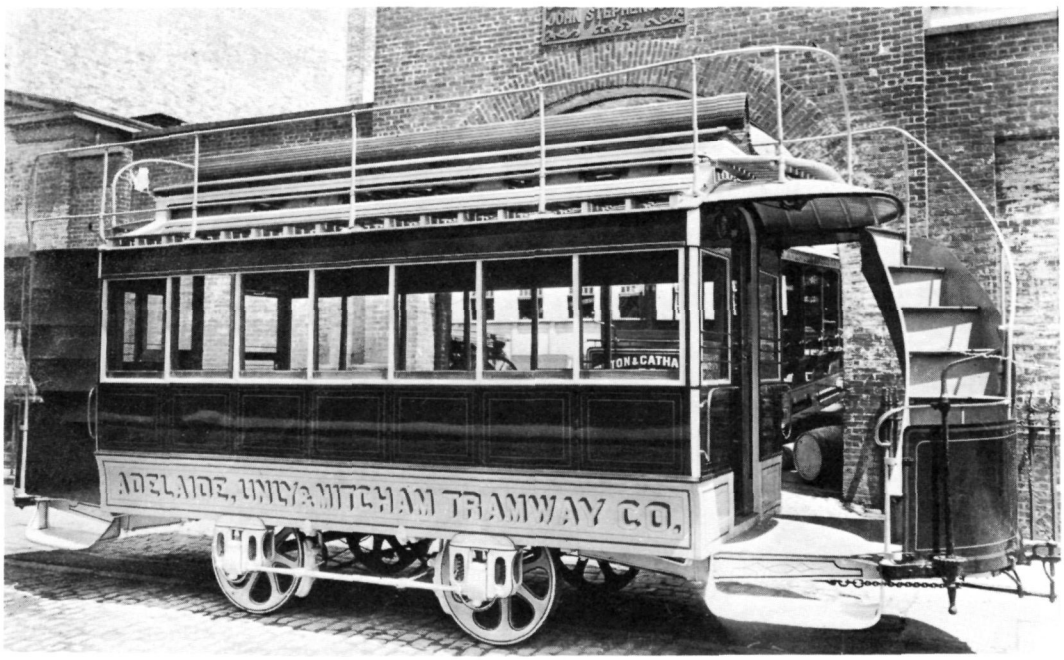
Thus in a little over two weeks four old trams have achieved more than transport theorists with their emphasis on all the latest overseas developments have ever achieved. They have given the people something that they understand and can identify with.

Of course, the concept of a tramway in Adelaide is really of a light railway; this would be further enhanced if the King William Street trackage was put in reservation. However *tram* is the operative word and any developments here can only encourage further developments in Melbourne where the tramways are on the move again anyway.

It appears that Brisbane and Sydney are past the point of no return although the deterioration of traffic conditions in Brisbane after the demise of the tramways no doubt hastened the electrification of the suburban railways.

Sydney passed up the opportunity for the introduction of a modern light rail (tramway) system when it was decided to complete the Eastern Suburbs line as a heavy weight railway, an expensive railway to nowhere which can only look forward to massive operating deficits. With this fiasco on its hands, the present State Government, although public transport minded, is concentrating on rehabilitating the existing network and does not appear to have any plans for anything new.

As demonstrated in both Melbourne and Adelaide this year an inner city site is necessary to draw the crowds and the lack of this in Sydney would seem to preclude turning the proposed celebrations of the centenary of the opening of the Elizabeth Street steam tram line into a potential comeback of the tram to Sydney.



THE HORSE TRAMWAYS OF ADELAIDE

by John C. Radcliffe

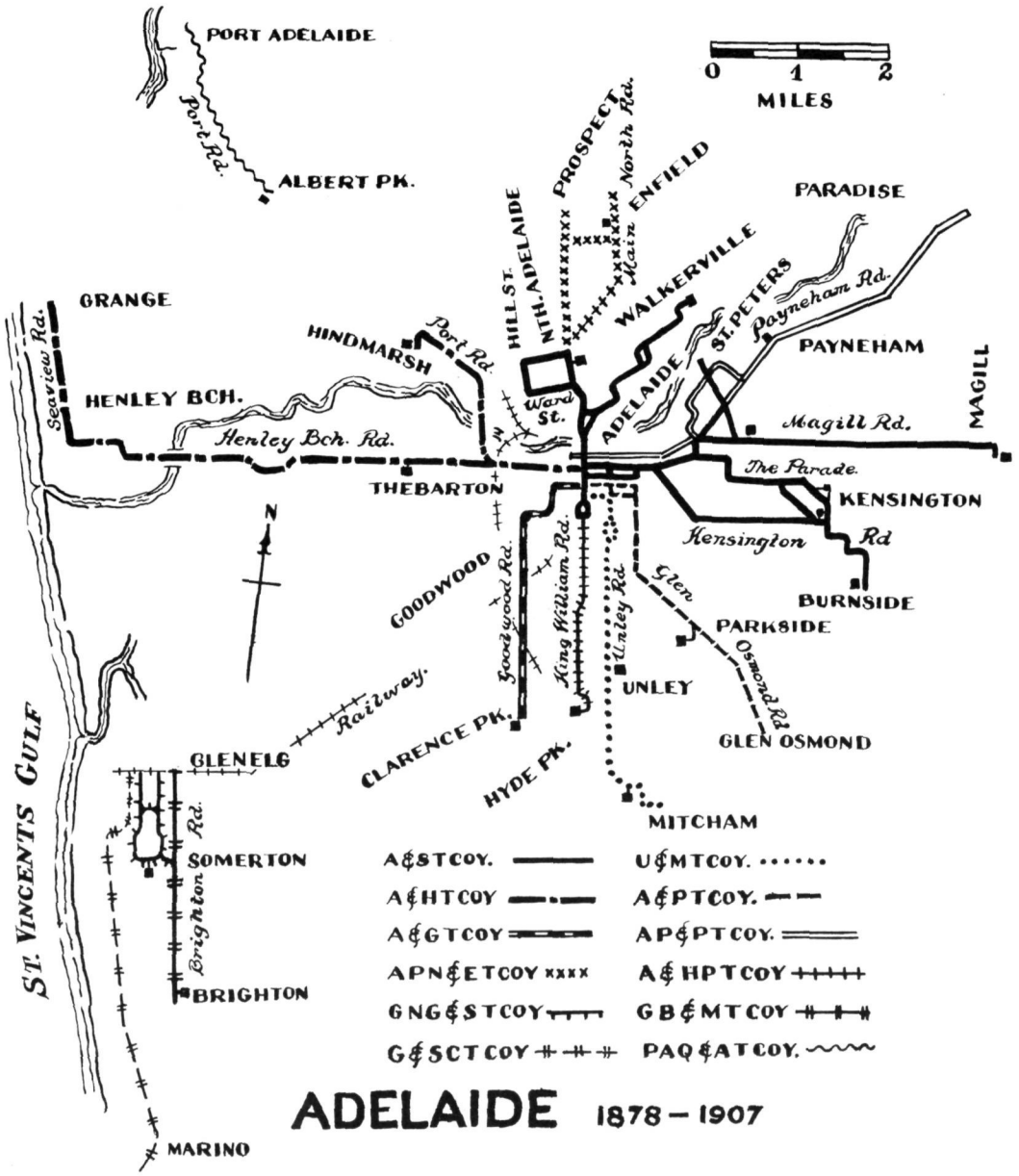
In 1978, the South Australian State Transport Authority is sponsoring celebrations for the 100th anniversary of the commencement of organised street passenger transport in Adelaide. The genesis of the system was the creation of the horse tramway companies in the late eighteen-seventies. Their establishment is reviewed in this article.

One of the remarkable features of Australian society has been the concentration of population into a small number of urban centres. Nowhere is this more evident than in the state of South Australia where 73% of the total population lives in Adelaide. This city has a population of over 900,000, and may be compared with the next largest town, Whyalla, whose population is only 35,000.

The colony of South Australia was founded in 1836 on an agrarian society and no significant industrialisation took place until the late 1930s. Yet in 1861, 30% of South Australia's population lived within ten miles of the Adelaide G.P.O., and by 1890, this proportion had increased to over 40%. The period 1876-1880 was a period of exceptional population growth, during which time the number of people living in Adelaide increased from 70,000 to 100,000. It is not surprising that growth at such a rate spawned in its wake an organised urban transport system.

The earliest transport in the colony had been provided by spring carts. Railways from Adelaide to Port Adelaide opened in 1856, to Dry Creek and Gawler in 1857 and to Glenelg in 1873. During this period, a variety of privately owned coaches, omnibuses and jaunting cars plied on the roads serving the villages around Adelaide. The standard road consisted of nine inches of 4" metal, topped by six inches of 2½" metal. In some sandy areas, corduroy roads consisting of horizontal sawn logs laid on longitudinal stringers were constructed. These roads did not perform well in the face of

ABOVE: *A car of the Adelaide, Unley and Mitcham Tramway Company, photographed outside the plant of John Stephenson, 27 th Street, New York, prior to shipment to South Australia in 1878. A spelling error was unusual for Stephensons.*
- Museum of the City of New York



heavy traffic and concerted attacks by termites. Such was the standard of transport provided on them that on April 22 1875, *The Register* was moved to comment that it had "attained the very extreme of inconvenience and discomfort".

The possibility of constructing a horse tramway between Adelaide and Glenelg had been investigated by the House of Assembly in 1871. The opportunity of using horsetrams to link Adelaide with the surrounding villages was recognised, but little enthusiasm was aroused.

Mr. W.C. Buik, sometime Rundle Street merchant, Adelaide City Councillor and later Mayor of Kensington and Norwood, had observed the successful operation of horse cars in England in 1871 and was even more impressed by their potential during a visit to North America in 1874. Upon his return to Adelaide in 1875, he attempted to get the Kensington and Norwood Council to sponsor the construction of a horse tramway from its municipal-

ity to Adelaide, but without success. Not daunted, he joined with Mr. E.T. Smith (later Sir Edwin Smith) to issue on April 23 1875 a prospectus for the Adelaide and Suburban Tramway Company Limited to "construct and work tramways for horse traction in, from, to and between the City of Adelaide, Kent Town, Norwood and Kensington". The necessary capital was soon subscribed. The Adelaide and Suburban Tramway Bill was introduced into State Parliament. Passage of the enabling legislation was difficult, the bill being strongly opposed in its later stages by lobbyists from the Adelaide Corporation which wanted stringent controls over the tramways within its boundaries. Its opposition was at least instrumental in the Company agreeing to pay rates assessed at £200 per mile of tramway rather than £10 as originally proposed. The Bill was finally passed in October 1876.

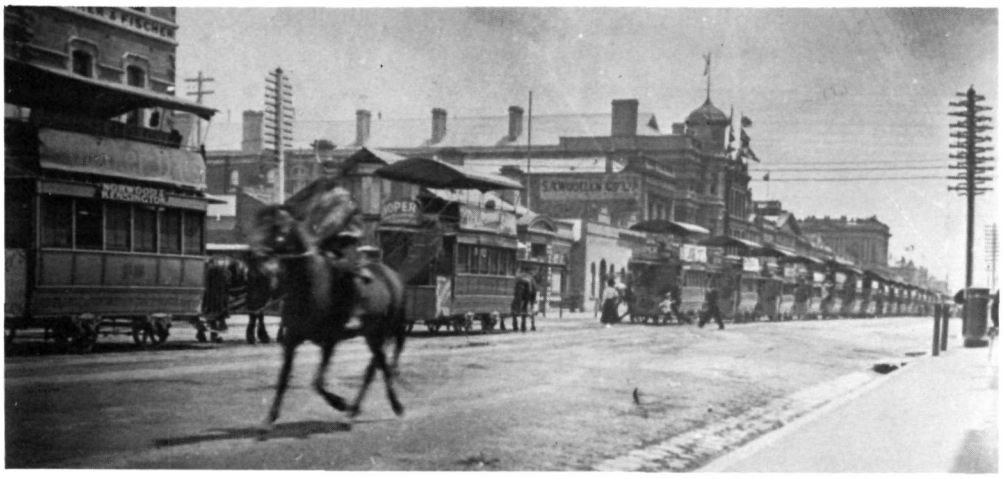
The Company placed an initial order for four double-deck and eight single-deck horse cars from John Stephenson of New York. The first of these was assembled in Adelaide in August 1877 by Messrs Duncan and Fraser who later built many horse cars in their own right and subsequently moved into electric car construction. The first car, double-decker no. 2, was displayed at the Royal Agricultural and Horticultural Show in September 1877.

The first sod for the Kensington tramway was turned by the Governor of South Australia, Sir W.F.D. Jervois on October 29 1877. Tracklaying proceeded with some difficulty and eventually the Company discharged its contractor and completed the job itself. The line was laid with Larson rails on Kincaid chairs. Rail lengths were 18, 21 and 24 feet, using rails of 45 lb/yd. The line was completed for trials in May 1978 and opened without ceremony on June 10 1878.

The line proved an outstanding success. During the first month, passengers averaged 8,000 per week, but within six months had increased to 20,000 per week. A 15 minute service operated from 7.30 am to noon and 3.00 pm to 8.00 pm, with a 30 minute service at other times. The Company charged 3d for a ride to any part of the line beyond the city boundaries. Tickets could also be purchased at 2/6 per dozen. Feeling encouraged, the Company built a line to North Adelaide and this was opened by the Governor on December 9 1878.

Once the Adelaide and Suburban Tramway Company had commenced work on its lines, prospectuses were drawn up for a number of other companies. Not all were rivals. It is noteworthy that Mr. W.C. Buik was chairman of the next company formed, the Adelaide, Hindmarsh and Henley Beach Tramway Company, and that Mr. E.T. Tramway Company was the next to commence operations. It imported three double-deck Stephenson cars, the bodies of subsequent cars being built locally by Duncan and Fraser using Stephenson running gear. A line 4¾ miles in length was opened for traffic on February 12 1879 by his Worship the Mayor of Adelaide, who was by this time Mr. W.C. Buik. The Mitcham Company had also imported a Baldwin steam motor but its use aroused considerable objection from upper-deck passengers and passers-by. It was abandoned within a few months and after a period of storage was sold to Sydney Ferries who used it from 1885 to 1937.

The Port Adelaide, Queenstown, Alberton and Portland Estate Tramway Company built a line 2¼

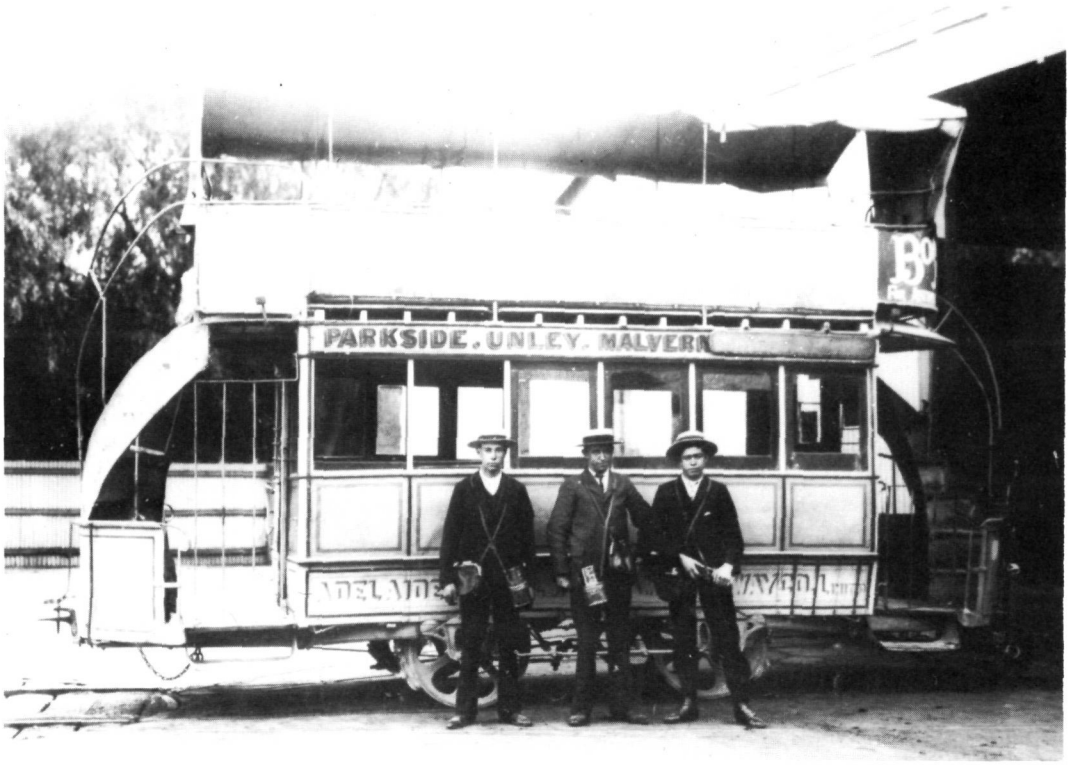


Horsecars often handled heavy picnic loads. Such is the scene in the above photo which is looking west on Grenfell Street in 1900. - Adelaide City Council Collection

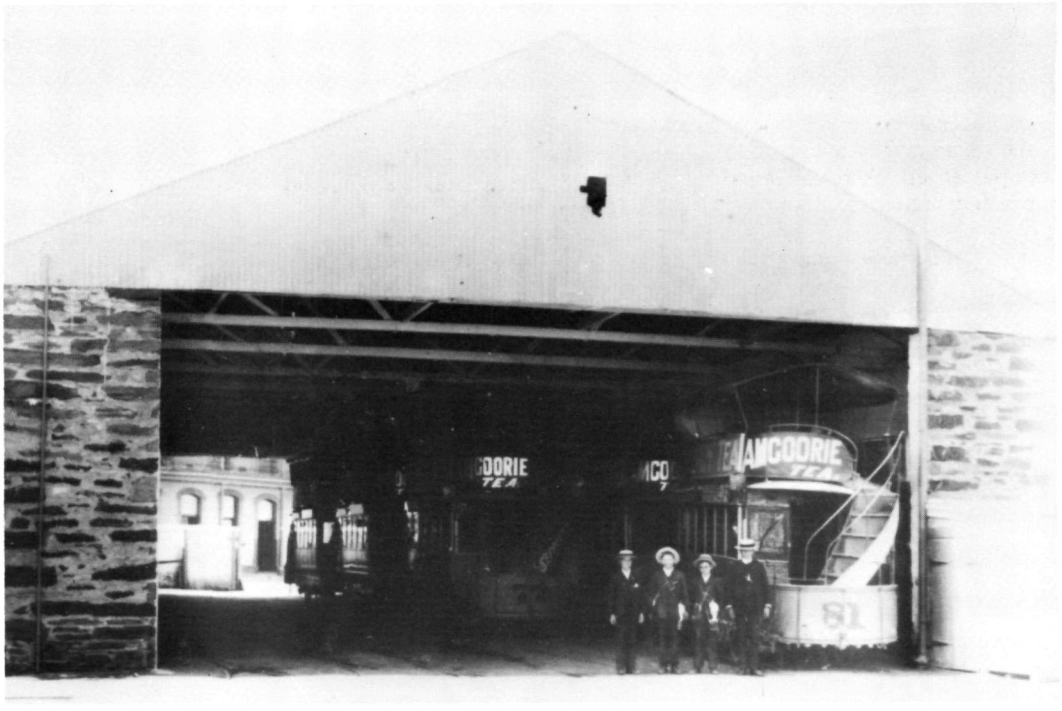
miles long of 5'3" gauge (all others being standard gauge) and commenced operations on May 22 1879 using a Merryweather steam motor (No. 80) named "Eureka" and two Duncan and Fraser double-deck horse cars. A hinged funnel was added to the steam motor to carry smoke clear of upper deck passengers. Although it had been intended to purchase a second steam motor, the working costs of the first unit proved greater than expected and the company was forced into liquidation in 1881. The new owner withdrew the steam motor in 1882 and sold it to the Glenelg Railway Company who used it until 1900. The Port Adelaide tramway was thereafter horse-operated. It may be noted that this was the last horsetramway to be operated in Adelaide, being converted to standard gauge by the Municipal Tramways Trust prior to the commencement of electric services in 1917.

The Hindmarsh tramway was opened by the Governor on October 23 1880 and was three miles and 40 chains in length. Five cars were used at the opening. A branch line was opened to Henley Beach on February 13 1883 and a further extension was opened to Grange by none other that Mr. W.C. Buik on May 14 1883. This extension did not enjoy a long life due to the availability of railway services at Grange. All but one of the Hindmarsh Company's cars were double-deckers, but unlike the other companies, canvas canopies were never fitted. This is believed to have been due to low clearances in their depot, and due to fear of strong winds capsizing the cars in Seaview Road, Henley Beach. The Hindmarsh Company was instrumental in testing the Julien Car (Trolley Wire, October 1977) the equipment supposedly having been installed in Hindmarsh car No. 8.

The years 1880-1882 were a period of financial splendor in Adelaide and a burst of financial investment in tramways, bordering on a "tramway mania" set in. By this time, Mr. W.C. Buik, who had been elected to the Legislative Council, had handed over the Adelaide Lord Mayoralty to Mr. E.T. Smith M.P., but still remained a Councillor. *The Register* noted that "a gratifying change had been wrought in the disposition of the Council towards the tramway movement" compared to a few years ealier. Two new companies received parliamentary sanction in 1881 and six more in



Adelaide, Unley and Mitcham Tramway Company Ltd. double deck horse car and 'Tram Boys' at Unley Depot cira 1905. Unley Depot was situated in Unley Road just north of the Eton Street intersection. The turntable at the left of the car was used to serve the four depot tracks in a similar manner to a railway roundhouse. - Searcy Collection.



Adelaide and Suburban Tramways Company Kensington Depot with double deck car 77 at the left and 81 at the right, circa 1905. - Searcy Collection

1882. There is evidence that the promoters of Adelaide and Suburban, now well represented both in State Parliament and on the Adelaide City Council, were effective in discouraging the passage of legislation which might compete with the senior company. One company which was unable to get its Act through was the Adelaide, South Norwood and Burnside Tramway Company.

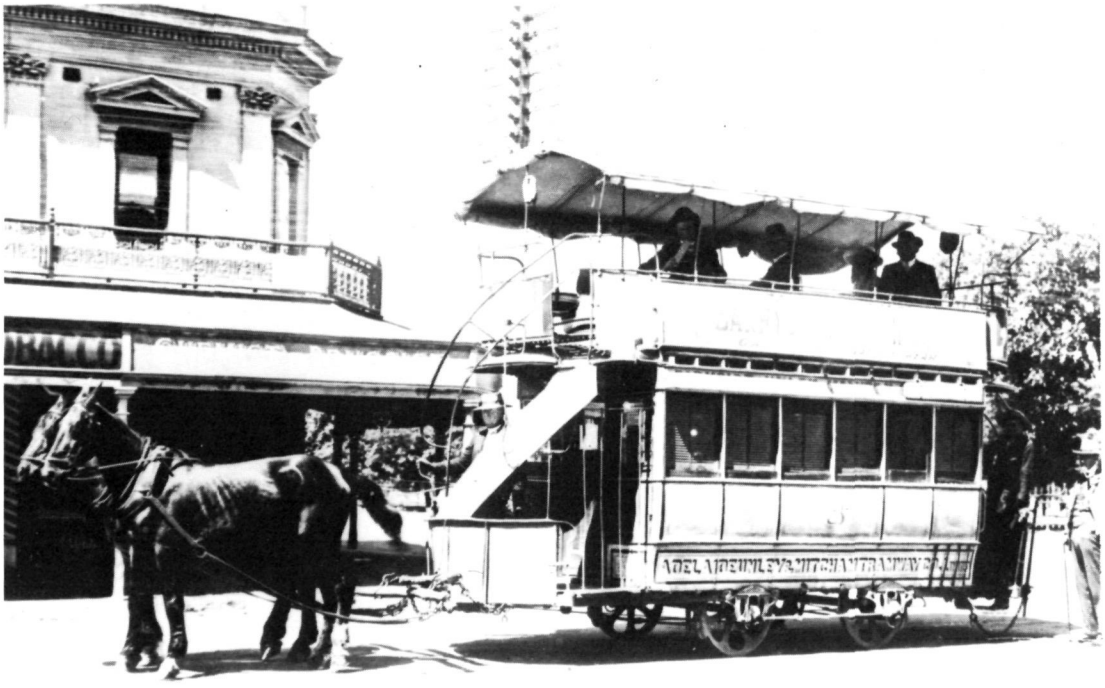
The Adelaide and Parkside Tramway Company Limited opened a service to Parkside on September 4 1882 with extensions to the Vine Inn on January 14 1884 and to Glen Osmond in March 1884. The Parkside Company's fleet included four Belgian tramcars which were radically different to all the other Adelaide cars. Two were open "toastrack" cars with five cross benches while the other two were small "combination" cars.

The Adelaide and Suburban Tramway Company extended its services to Walkerville on November 7 1882, Maylands on December 19 1882, The Britannia on April 1 1883, Marryatville on July 3 1883, Magill on August 13 1883, Hill Street, North Adelaide on September 4 1883 and Burnside on October 22 1883. Numerous depots were provided (see map). Large car sheds were later added at Marryatville in the 1890s and there the Company built its own cars. A large proportion of its fleet were single ended cars, being turned at termini on loops or turntables.

The Adelaide and Goodwood Tramway Company began running to Goodwood and Clarence Park on November 22 1882. It owned six double deck cars and two omnibuses. This tramway was generally considered the poorest in Adelaide and was sold to Mr. Charles Wilcox in 1896.

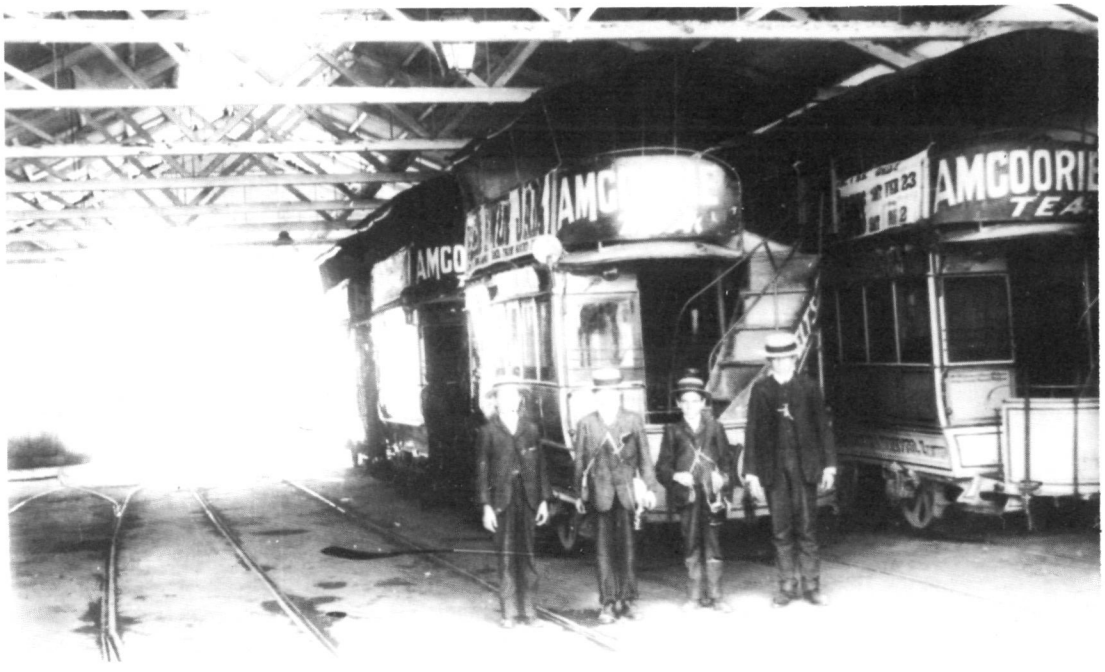
The Adelaide, Prospect, Nailsworth and Enfield Tramway Company built its lines from the North Adelaide terminus of the Adelaide and Suburban Tramway Company, commencing services to Prospect the Enfield on September 24 1883. The tracks of the two companies crossed but did not connect. In 1884, the Prospect Company was sold as a result of financial difficulties following the capsizing of a double-deck car on the Main North Road. It was purchased initially by a Mr. Fry and later by Mr. Ragless. The latter owner, after a dispute with Adelaide and Suburban over fares, built six carettes to carry his passengers from North Adelaide into the City for a fare of 2d compared with 3d on the Adelaide and Suburban trams. The senior company quickly bought out the Prospect and Enfield lines, linked the tracks to its own and commenced running through services.

The Adelaide and Hyde Park Tramway Company opened its 2¼ mile line on September 1 1883. It attempted without succes to get parlia-



ABOVE: *Adelaide, Unley and Mitcham Tramway Company double deck car 8, cira 1905.*
- Searcy Collection

BELOW: *'Tram Boys' at the Adelaide and Suburban Tramway Company's Kensington Depot cira 1905. Car 77 stands behind the group.*
- Searcy Collection



mentary sanction to extend its tracks to West Adelaide and East Adelaide in 1884.

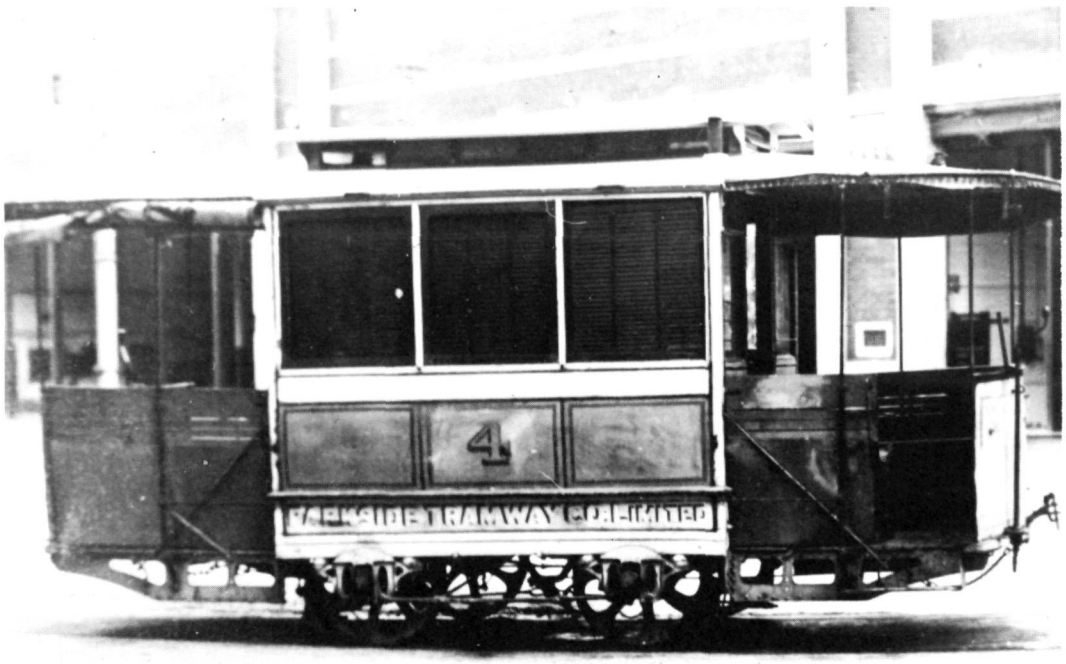
The Glenelg, Brighton and Marino Tramway Company operated from 1883 to 1914. One car normally sufficed to run the service but two were provided on holidays. Although the line included some loops, it was customary to derail one car whenever two cars met travelling in opposite directions on the single track.

The Glenelg, New Glenelg and Somerton Tramway Company opened on September 17 1883 but did not operate beyond 1886.

The last of the tramway companies to commence was the Adelaide, Payneham and Paradise Tramway Company which began running to Payneham on December 19 1883. Running rights into the City were secured by using Adelaide and Surburban tracks between Nelson Street and Kent Terrace, Kent Town, and then via a single track line in North Terrace. An extension opened to Paradise on February 18 1884, but by the following August, the company was in difficulties and the management resigned. Crews continued operating for a week with no one in charge at all. Subsequently the company passed through several owners, finishing up in the hands of Mr. Charles Wilcox. Mr. Wilcox opened a new line through The Avenues (St. Peters) from November 13 1889. This was worked as a feeder service using a small single-deck one-horse car.

The Adelaide, North Adelaide and Ovingham Tramway Company, despite parliamentary sanction did not manage to build a tramway at all, though its prospects may well have aided the land speculations of some of its shareholders. The Keswick, Ashford, Richmond, Edwardstown and South Road Tramway Company was similarly placed.

By 1885, economic conditions in Adelaide had begun to deteriorate. Population growth ceased, and soon afterwards people began leaving for the Western Australian goldfields. In 1893, the introduction of bicycles seriously lowered passenger numbers of the smaller companies. A prolonged drought in the period 1895-8 raised the price of horse feed to very high levels. Periodic outbreaks of equine influenza affected schedules from time to time. To reduce costs, services were reduced, and some routes, notably that to North Adelaide, were converted to one-man operation. Tracks and cars deteriorated to the point where in the 1890s, it was possible for horsedrawn omnibuses to once again compete effectively with the tramway companies. Although the Adelaide and Suburban Company generally paid an 8% dividend on its shares each



One of the Belgian cars operated by the Parkside Tramway Company was photographed at Hackney Depot prior to disposal in 1910. - STA Collection

year, the other companies struggled financially for most of their existance. The Adelaide Hindmarsh and Henley Beach Tramway Company was noteworthy for not having paid a dividend in any year, and was not free of its establishment debts until 1904.

No major changes were made to the operations of the companies after 1885. A variety of schemes were proposed to electrify the routes in the earlier 1900s, all without success. Finally the South Australian Government purchased the companies in 1906 for £280,000, and on February 5 1907, the newly-formed Municipal Tramways Trust took them over and proceeded to convert them to electric traction. The assets taken over and compensation paid at that time are shown in table 1.

TABLE 1: Assets acquired from Adelaide horse tramway companies by the Municipal Tramways Trust (CPW 841/1906).

Company	Compensation	Cars	Carettes	Wagonettes	Omnibuses	Horses
Adelaide & Suburban	£157,146-11-10	92	6	1	11	648
Unley & Mitcham	£ 37,617-11-9	16	-	2	-	156
Parkside	£ 24,218-12- 2	14	-	-	-	88
Hindmarsh	£ 19,266- 0- 8	16	-	1	-	116
Hyde Park	£ 17,068- 2- 5	9	-	1	-	56
Payneham)		9	-	-	-	56
) C. Wilcox	£ 25,055-10- 5					
Goodwood)		6	-	-	-	36
TOTAL	£280,372- 9- 3	162	6	5	11	1056

The Port Adelaide tramway was purchased separately from G.L. Gardiner on August 22 1913 for £4,000.

FURTHER READING

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Adelaide and Suburban also imported Stephenson cars which had been built as double deck cars. When first introduced they operated without canopies. Car 76 is seen in King William Street about 1880. - Adelaide City Council Collection

TRAMWAY MODELLING

TRACKWORK FOR TRACTION

by A.W. Perry

In the past it was usual to refer to a model track gauge by a code number or letter, e.g. HO O 1 etc. This probably resulted from the way prototype gauges each had one name and, the point usually overlooked, ONE SCALE (1:1). Originally virtually all modelling was of standard gauge prototypes, but with the advent of narrow gauge modelling using either existing model gauges with larger scales to suit or existing scales with narrower gauges to suit, a clearer system of notation became necessary. Thus 9mm gauge may variously be N for standard gauge prototypes, HOn2½ for 2'6" (762mm) gauge prototypes or 002¼ for 2'3" (686mm) gauge prototypes, with the scales of the models being 1:160, 1:87 and 1:76 respectively. OOn2¼ is also referred to as 009, a notation more suitable for metric use.

Replacing the 2¼ in OOn2¼ by the metric equivalent, 686 (mm), would result in a cumbersome OOn686 notation. It is less cumbersom to use OO to denote that it is 1:76 scale and use the model track gauge of 9mm to make 009 the notation. Most model track gauges are only two digit numbers and the worst of the three exceptions can be rounded off to 22.2 or 22.3mm gauge.

To check the correctness of a model track gauge against the prototype simply multiply the model gauge by the scale, e.g. for HO, 87 x 16.5 = 1435.5 which is only 0.5 scale mm overgauge for standard gauge (1435mm). Prototype tram track is maintained with greater accuracy than railway track due to the use of wheels with narrower treads and where grooved rail is used there is little latitude before flanges begin to bind in the grooves. Model track can be gauged to the nearest actual half mm; not too many modelers try for anything more accurate.

The limitations for gauge variation on the Melbourne tramways are from 1427 to 1448mm. In Sydney the railway practice of gauge widening on curves was used, steadily increasing until the gauge was 1457mm on a 50' radius curve. Excessive gauge widening will result in wheels falling in between the rails, a problem encountered when running trams along railway lines.

Light traction lines use 60lb/yd (30kg/M) and heavier flat bottom T rail and 80lb (40kg) and heavier grooved rail though an Australian Standard 102lb (51kg) grooved rail was adopted by some systems in later years. Sydney, in particular, often used an 80lb (40kg) flat bottom rail with bolt on groove for paved track. Brisbane followed a more economical course with 82lb (41kg) flat bottom rails in mass concrete paved tangent track and with the groove simply formed in the concrete, a practice recently adopted in Melbourne. Open ballast track construction is similar to railway practice although it is usually lighter with guard rails or heavy grooved rails used on sharper curves, as is the practice on paved track. Due to their close relationships with railways even paved track on the NSWGT and WAGT had a decidedly railway appearance.

Model rails are mostly flat bottom section and made in nickel-silver, brass or sheradised steel. The latter is the most realistic and if kept oily it will give little trouble even if used outside. If you must have grooved rail and can not buy it, it can be fabricated by taking a smaller FB rail and soldering its head side on into the web of the running rail. The size of model rail is usually referred to as Code 70, Code 100 etc.; this refers to the height in thousandths of an inch, e.g. 100 is 0.100" and 70 is 0.070". Divided by 40 this gives the height in mm. The locally produced large extruded brass rail tends to increase in size with each batch as the die wears out.

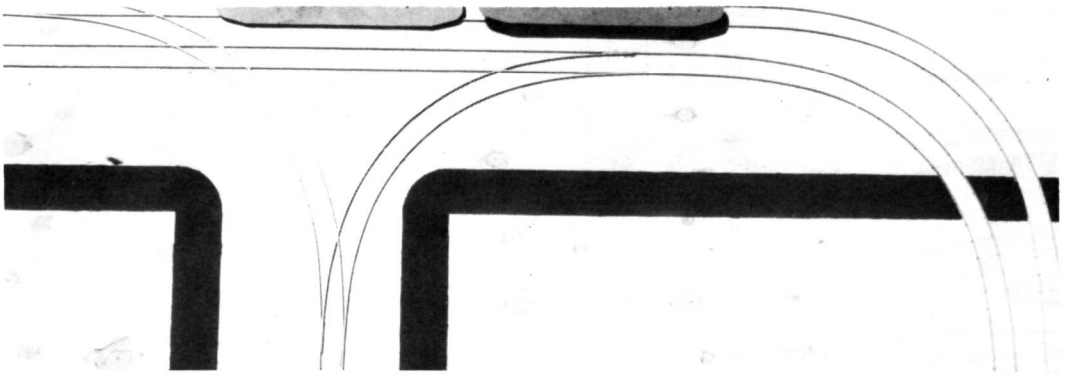
For best effect sleepers should be scale length and width and spacing when laying track, but need not be scale thickness. Cardboard, stripwood or plastic can be used successfully. Most sectional and flexible track made for gauges up to 45mm is intended for standard gauge lines and the sleepers are too short to represent narrow gauge track. When springing flexible track into tight radius curves the spacer pieces between the sleepers under the rails often have to be trimmed to allow enough flexing. When laying any curve it helps to draw the centre-line on the base board with a trammel or even a piece of non-stretchy string tied securely to the pencil and with a nail as pivot point. When laying rail individually it is usually best to spring it into a curve, spiking it as you go, to get a smoother curve. O gauge spikes will usually suit gauges of 32mm and larger. Do not kink a curved rail and try to avoid rail joints on sharp curves as they tend to dog leg and, like a kink, cause derailments. Rail joints on tangent track must be properly aligned and levelled also for good running. A three-point or roller type track gauge will help lay better track more easily. Welded joints can be represented by careful solder-

ing and fishplates are possible on mechanical joints in the larger scales, but modellers usually use simple slide on rail joiners, of insulated types where rails must be electrically sectionalised. At non-insulated joints electrical resistance must be kept to a minimum and they should be bonded. In the larger scales there is usually enough clearance to drill a hole about 1.5mm dia. in the web near each end of each length of rail. These and the ends of a short length of bare copper wire are tinned with a soldering iron then the ends of wire soldered into the holes so that it forms a traction bond bridging around the rail joint. The bond and gap in the rails allowing for expansion of the rails with temperature variations.

The space between the tracks of a double track line is variously referred to as the 'six foot' or 'devil strip' (vaguely defined in USA publications) but 'track centres' is the preferable nomenclature as it is car dimensions, not track gauge that is important. On tangents maximum car width is the deciding factor, but minimum acceptable clearances varied from 12" (305mm) in Perth up to 18" (457mm) elsewhere. Melbourne's absolute minimum is 15" (381mm) and Sydney allowed a momentary reduction to 10" (254mm) between the corner of a car on a diverging route at a junction and the side of a car on the other tangent track. In the later case the footboard of the car was allowed to project 3" (76mm) beyond the carside. This avoided expensive localised widening of the tangent track centres through a junction. A 150' (45.72M) minimum radius curve from the blades until clear of the fouling point of the other track was necessary in Sydney.

Thanks to an out moded Act of Parliament Brisbane's trams were restricted to 7'8" (2286mm) in width resulting in the narrowest track centres used in Australia, 9'2½" (2807mm). Perth used 9'4" (2845mm), Adelaide and Sydney 10" (3048mm) and Melbourne 11' (3353mm). Where centre poles supported the overhead in Adelaide this was increased to 12' (3659mm); in that city all cars ran with the offside footboard folded up. Tramways often superelevated the rail nearest the other track on tangents by about ½" (13mm), apparently for drainage and better clearance, but it is not known if the 'street railways' of Sydney and Perth followed this practice. The terms high rail and low rail are derived from this. Double tracks are known as inbound and outbound and their rails as near or far as a relationship to the respective kerbs.

Brisbane FM 544 appears to want to go straight ahead rather than around the tight balloon loop at Ascot - Doomben.



915 mm X 2400 mm ply sheet with 1:32 scale junction and double track curve with both tracks of 599 mm radius. All curves use Lorain no. 3 switch transition curves. Junction curves are 500 mm and 570 mm radius. Clearances suit Adelaide H cars, two outlines of which can be seen on the uppermost track. Gauge 45 mm; track centre 115 mm.

Curve radius can be as tight as 35' (10.67M) in the USA but in Australia 40' (12.19M) on narrow gauge systems was the tightest. Nominal minimum curves were 50' (15.24M) in Sydney and 60' (18.29M) in Adelaide and Melbourne. Brisbane had a 42'2¼" (12.91M) curve in The Valley, Sydney used 45' (13.71M) for balloon loops at Cabarita, Circular Quay, Queens Square and Railway Square and for part of the Erskine Street loop. Malvern Depot in Melbourne has some 48' (14.63M) curves and the balloon loop at Victoria Park in Adelaide was 55' (16.67M). On sharp curves the NSWGT used guard rails, other systems special heavy grooved rails. The radius is taken at the centre line of the track.

Sharp curves do save space but can create operating problems, particularly with coupled cars and trains due to coupler swing and increased tractive resistance, if not bogie swing. On HO tram layouts 10" (250mm) is a recommended minimum radius, even though some cars can negotiate down to 4¾" (120mm). Cars of the same prototype but from different manufacturers may not negotiate the same curve due to differing drive arrangements. In the prototype large cars were sometimes not allowed or required to use certain lines which had extra tight curves; so, providing it was not at a critical point on a layout the same can be applied. A sharp curve on a rising grade can stop a car restarting or stall it or overload the motors, so though few tramways were flat, especially Sydney and Brisbane, be careful.

To allow for the overhang of a car inside a curve and its throwout outside a curve, track centres must be widened increasingly as the radii are reduced. On long curves railway practice of concentric curves with radii taken from a common centre point are used but at intersections this may or may not be used. In Sydney it was mainly the case but Adelaide used the USA system of both curves of the same radius, each taken from a different centre; this gave a greatly increased clearance halfway around the curve and placed the turnouts in tandem at grand unions and other 90° intersections. It also favoured a more gradual taper of cars ends than did the Sydney practice. Melbourne uses a variation of the USA system by using a radius of 10' (3.05M) greater for the inner track than the outer one. When designing a new junction, transparent plastic car outlines to the same scale as the drawing are used to check clearances between passing cars. Modellers can also do this or cut out pieces of hardboard of the necessary car outlines and mount them on bogies and move them around the track to check clearance between cars and between cars and structures.

No Pass curves were found in the USA, Perth and Brisbane where track centres were not wide enough for cars to pass safely; in Brisbane signs were hung from span wires as a warning to drivers.

Where roadways were too narrow to allow a desired curve radius being used and the corner kerb could not be cut back tracks sometimes swung to the far side of the road approaching such a corner to get a swider sweep. This can still be seen in the road formation near Petersham Station in Sydney. At the corner of Walkerville Terrace and Smith Street Adelaide, one time end of double track, the tracks swung normally from the centre lanes of the road to enter Smith Street, but once around the corner had to swing to the far side of Smith Street then back to the centre lanes. Before duplication a simple curve connected the outbound track to the single track in the centre of Smith Street. Sometimes a single track curve only would be used at a tight corner on an otherwise double track route.

To provide a smooth entry and exit to curves

OP 1451 climbs the 1:12/1:11 grade in Hunt Street, Sydney, after traversing the reverse curves from Goulburn Street. Both tracks have raised guard rails on the curves. This combination of severe curves and grades should be avoided on model layouts.

andsafely widen out the track centres at each end of the curves transition curves of gradually diminishing radius are used on the prototype and are recommended for modelling.

In addition to horizontal curves one must consider vertical curves (easements) where there is a change of grade. Melbourne appears to have once used 600' (183M) at crests but now uses 800' (244M) and 1000' (305M) in hollows. In contrast Sydney used 650' (198M) and 1500' (457M) respectively. With models we are forced to use more severe vertical easements but with care there should not be any undue problems. If it is necessary to use an easement on a horizontal curve, ensure that there are no joints in the track baseboard along it, then even four wheelers with fine scale wheels should stay on the track. On other curves any joint in the baseboard should be radial to the curve to ensure smooth operation.

Open ballast track was once the normal practice for private right of way (PRW) and reserved track, with ballast almost completely hiding the sleepers and up to the rail head to improve the chances of the life-guard (people catcher?) picking up any errant pedestrian, on some systems. This also presented a reasonably level surface and allowed rubber tyred tower waggons to be used on these sections of track. Today such tracks may be laid in mass concrete like normal street track, a practice introduced locally by Brisbane in the 1940s and now also used by Melbourne. This reduced maintenance though it lifts noise levels.

Street track may be sleeper track buried in the road (NSWGT), use old rails as widely spaced sleepers (Brisbane) or be laid on a concrete slab with tie bars holding the rails apart. The road surface could be wooden blocks (up to about 1950), granite setts (Bendigo), concrete, tar or asphalt surfaced. Most of these were to be found on the larger systems. In modelling it does not matter much what is under the paving unless you are going to model track repairs. One English modeller uses Polyfila for making granite setts, carvng each one individually. Cardboard, wood and plaster have been used with varying success, but as the 1:16 scale modellers say 'only concrete looks like concret' which is just what they use. Plaster must be used wisely for any excess will be carved out by the flanges and rolled on top of the rail head to create operational problems. Unfortunately, the smaller the scale the more oversize are the flangeways, something which becomes very obvious in photos.

In Adelaide the Col. Lt. Gdns line was only allowed to pass throught he parklands on the condition that the tracks were grassed to rail head. Track maintenance therefore included lawn mowing. A section of Dandenong Road, Melbourne, received similar treatment some years back. Landscaping was sometimes used to beautify reservations; Brisbane's Chermside line had rose garden

borders. In Whitmore Square, Adelaide, trams had to traverse an awkward squiggle in the track to avoid some trees, thanks to early conservationists. In one German city where there was a tree close to the kerb each side of a narrow roads the tracks slewed briefly towars each other to save the trees, forming a rather rare NO PASS tangent, but not a guantlet track.

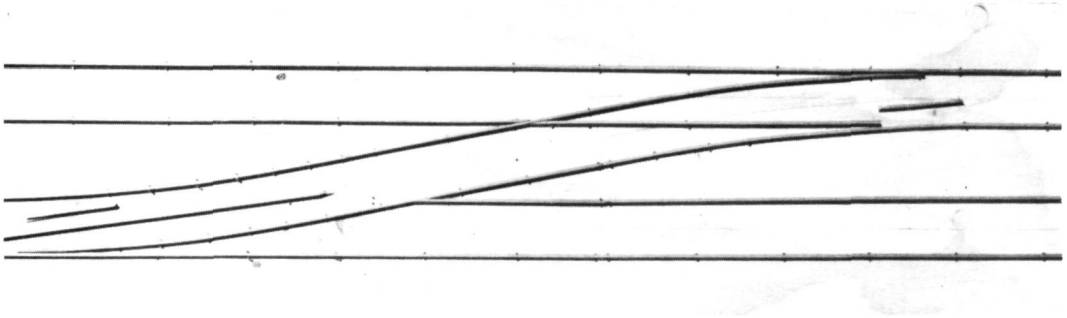
Tramway turnouts, crossings and even simple curves are classified as specialwork. In USA and sometimes in Europe, tramway specialwork permitted the operation of railway standard rather than the narrower, shallow flanged tramway wheels. In Australia only Sydney provided for this on the Kogarah and Cronulla steam lines and the Rockdale to Brighton line, originally steam worked but later electrified. The perways yards at St. Leonards and Wolli Creek, which had railway connections, could also accept vehicles with railway wheels. Steam and electric trams, with tramway contour wheels were hauled over the railway system between the various isolated tram systems, but with servere speed restrictions and with special plates on all frogs. The flangeway at a crossing is only 1⅛" (28.6mm) for trams but for a train is 1¾" (76 to The overall width of a tram tyre is only 3" to 3½" (76 to 89mm), while for a train it is 5" to 5½" (127 to 140mm), though tram wheels are further apart on the axle due to narrower flanges; 4'6 11/16" (1389mm) tram, 4'5½" (1359mm) train, standard gauge. Most model wheels are somewhat oversize.

Turnouts, variously called points or switches, are firstly classified as facing or trailing depending on the direction of traffic flow through them. Then left hand or right hand if there is an easily defined diverging track. Next they may be stub, double bladed, switch and mate (single blade) or trailing (bladeless). Finally geometric shape completes the description, left hand, right hand, symetrical or Y turnouts, threeway or tandem, single slip, double slip, crossover and scissors crossover.

The switch and mate turnout was once standard on most tramways but in Sydney they were only used in the depot yard at Fort Macquarie and were fabricated from flat bottom rail in true tramway fashion. Normally both units were cast manganese steel and designed as a self contained unit fitting flush in the roadway. In more recent years Melbourne and to a lesser degree, Brisbane, adopted two switch units for facing turnouts in an endeavour to get more even wear; the two switch blades are connected by a tie rod. On some tramways, trailing turnouts had two independent switches, a potential trap for emergency reverse moves as each switch had to be operated to set the right track.

The NSWGT used a railway type turnout but with short, straight blades, often operated by a ball or throwover lever at the tracks side on PRW or reserved track and occassionally by a removable Thompson type lever at the kerbside on paved sections, though mostly operated by a point hook fashioned from a flat steel bar, rather than the short crowbar like pointbar of switch and mate systems.

R 1927 turns from Crown Street into Campbell Street, Darlinghurst. A standard Sydney turnout is in the foreground. The heavy wooden cover over the pit and the slot in the steel plate for the point hook are visible.



Correct scale (1:32) no. 5 crossover with wide track centres for centre poles, nears completion. Apart from soldering, only the switch blade and its pivot remain to be installed on the upper turnout. The lower turnout requires this also plus the installation of the straight closure rail. Guard rails will be fitted and flangeways cut in the Vee crossings after soldering. Gauge 45 mm; track centres 115 mm; radius 1430 mm.

An expensive pit over three feet deep was dug between the rails to house a mechanism consisting of a larger ball weight sliding back and forth across a crescent, which moved the blades. The point hook was inserted through a slot in the large wooden cover over the pit, at an angle. A trawling action hooked the ball weight's carrier and it was pulled towards the stock rail it was wished to move the blade against. Like all tramway turnouts not operated by a signal box they were trailable with safety and could serve as spring loaded turnouts for passing loops on single track sections. In NSWGT practice facing turnouts at some junctions were always left set for one line, hence some cars had to stop to set their route, then stop again to reset it, the conductor usually signalling the driver to proceed when the latter was done by a couple of sharp bangs on the rear bumper (or apron in later years) with the point hook.

Many years ago SPER member Ben Parle developed a NSWGT style hook operated turnout for his 32mm gauge layout, creating much interest at the 1957 Exhibition at Sydney Town Hall. The ball weight was replaced by a spring toggle mechanism with a vertical helical spring in the pit. A horizontal spring toggle mechanism is used by prototype switch and mate turnouts.

In modelling the switch and mate turnout has lost much of its novelty due to use at exhibitions for over 20 years, but its simplicity has much to recommend it. In the prototype there are rules to determine which rail a switch goes into but on a model it is best to place it against the curved stock rail. This allows a minimum width straight flangeway in the mate which reduced the gap a wheel must bridge when taking the curved diverging route. The author's sequence in laying rails for such a turnout is: straight stock rail, curved stock rail, switch blade, mate with its curved rail running right around the curve, then the straight rails either side of the V crossing (frog). The straight rails are filed so that their web tucks into the web of the crossing's curved rail to give a more solid soldered joint. If the turnout has the curve continuing through the frog, guard rails on both rails of the curve will be essential for smooth running through the crossing, otherwise trucks round the curve crabwise. Flangeways through the crossing are cut in the final stages of construction. For a time Sydney, at least, used mainline frogs at some little used crossovers, the mainline rail being unbroken through the frog. A simple pivot for switch blades is a piece of non ferrous wire rod passed through a vertical hole int he baseboard and soldered into a hole drilled up through the foot of the switch rail into the web. Point motors or any other drive mechanism can then be easily mounted under the baseboard. A brass or copper shim under the stock rail and switch will improve both its movement and electrical pick up. A suitable drive rod can be made from a piece of 22 swg phosphor bronze trolley wire about 75mm long. This allows for a differing stroke between the point motor and switch blade and allows turnouts to be safely trailed through. To spring load a turnout without a point motor a steel pin is simply driven in to bias the wire to the required side.

Although it is NOT recommended practice and the use of a good track gauge is preferred, some modellers use wheels or bogies for gauging track while laying it. Roller type gauges are less than ideal for laying tramway curves, while the three point type must be used with the single point on the inner rail of a curve or instead of slightly widening the gauge it will be narrowed and probably cause derailments.

If using wheels/bogies to gauge track you must ensure that the wheels are correct before you start. Not only must flange and tread widths and more importantly, the back to back of the wheels be correct but all wheels must run true on the axles. One spot where are useful is in gauging turnouts at the switch blades and ensuring that a mate's tangent flangeway is as narrow (about 1.25mm in 1:32 scale) as possible to provide the smoothest possible

ride taking the curved track. The tangent track is laid tight to gauge at this point.

When checking curves anywhere it must be remembered that a truck under power does not track the same as one pushed around by hand. It runs crabwise with the leading axle hard against the outer rail and the trailing axle hard against the inner rail.

Brisbane had some early type switch and mate turnouts where a hard rubber block was used instead of a spring toggle to hold the switch in position. In addition to the methods already mentioned prototype turnouts may be operated by point turners (an overgrown point motor), electric, hydraulic or air motors or simple mechanical rodding from a lever frame. The point turners can be operated by the driver of an approaching tram via a contactor on the overhead wire on the power on (for curve) and power off (for straight) system, or overseas, by an inductive system.

As it is not usual to use any form of facing point locking on tramways, it is usual to try to have as many turnouts trailing as possible, turnback crossovers being a good example. Where both rails through the frog are straight, tramways commonly use a No. 5 turnout, one where the angle that the rails cross at is 1 in 5. Single and double slips use the same angle; these two types of turnouts were used mostly in Sydney, as were scissors crossovers. The earlier scissors crossovers were symmetrical in layout but this complicated the diamond crossing where normal track centres were used due to the closeness of the inner rail of each track. Later, an assymmetrical layout was adopted with the inner rail of one track only crossing the diamond. An example of this latter type was recovered from Rozelle depot by SPER for eventual use at the new museum site.

Where a single track line was likely to be eventually duplicated the track was set to one side of the centre of the road and passing loops occupied the middle two lanes of the road. If duplication was unlikely the track ran down the centre of the road as in Ballarat, Bendigo and Geelong. In these cases symmetrical passing loops occupying the middle two lanes of the road were used. With these a turnout known variously as an equalateral, symmetrical or Y was used until in more recent times it was decided to standardise by using normal V crossings and switches rather than the previous

Symmetrical scissors crossover at Bronte Beach Terminus. Although on private right of way, the crossover and stub terminal tracks are paved. This crossover was later replaced, only a few years before abandonment, by a standard Sydney assymmetrical crossover, the last such installation in Sydney. - A.W.Perry

special units with curves for both routes starting from the toe of the switch. Now one track does so and the other starts curving just beyond the heel of the switch and the reverse curves are of different radii. Melbourne uses these newer Y turnouts for single track terminals at the end of double track routes.

True three way turnouts are rare. Light Street Depot, Brisbane, had the only local example. The blades lay almost together, one against the other on each rail, requiring great care in operation. A simpler arrangement is the tandem turnout still found on our suburban electric railways. Here the toe of one set of switches is slightly behind the heel of the other turnout making up a three way combination.

As time has gone by tramways have cast aside prestige symbols such as unnecessary grand union junctions and special work has become more functional, except where complications are absolutely unavoidable. Herein lies a lesson for modellers. Do not get carried away with grand track plans. Track and its overhead need maintenance, taking up time you may prefer for building new cars or structures or just operating. Good design and construction minimises, not eliminates maintenance on the best of layouts.

Forthcoming articles in this series will cover power supply and overhead construction. Other building and operational aspects and problems will be dealt with from time to time. Since the first modelling article was published it has become apparent that many more modellers are trying their hand at trams than was originally believed. The one thing that emerges is that there is no agreement as to which scale is the more suitable to use. One aim of these articles is to try and achieve some degree of standardisation within a scale regardless of which is used. Hence the emphasis on many aspects of prototype practice which tend to be overlooked and the attempt to translate them into reliable model practice.

We will be pleased to try to answer any queries you may have on tramway modelling and would like to also hear from you on subjects you would like covered in future articles. Write to

MODEL TRACTION ASSOCIATION
Box 103 P.O.,
Sutherland 2232 N.S.W.

and enclose an S.A.E. if a reply is required.

Symmetrical Y turnout at crossing loop in Lydiard Street North, Ballarat. Bogie car 41 passes northbound 4 wheeler 32.

HERE AND THERE

NEWS ITEMS OF INTEREST FROM ALL OVER

ADELAIDE TRAMWAY CENTENARY

Tramcar Moving - STA Style

As planning developed for the Adelaide Street Passenger Transport Centenary, it soon became apparent that the highlight of any form of celebrations would be the return of some old trams to the streets of Adelaide. The AETM had some excellent candidates at St. Kilda, but how were they to be moved to the city? Numerous inspections were held at St. Kilda and discussions centred on cranes, dismantling, lifting, numbers of vehicles, backing into City Depot, crane limits there, risk of damage to the trams and ease and safety of operation. Use of the STA tramcar jinker was considered (TW December 1974) but this did not meet with any enthusiasm from those likely to have the job, particularly as they had moved car 381 to St. Kilda on it in 1964.

Finally, it was decided to construct permanent ramps at both St. Kilda and Morphettville and to drive the trams directly onto low loaders on which rails had been laid. The ramps were constructed by STA perway teams under the supervision of STA Engineer Haydn Hart, who as a member of the Pichi Richi Railway Preservation Society, had considerable previous personal experience with this type of operation and who had moved the Society's T class 4-8-9 steam locomotive from Islington Workshops to Quorn by road.

Daily between 16 and 19 May 1978, a tram was driven onto a low loader at St. Kilda at 9am and by noon it had been driven off at Morphettville and within an hour or so was safely in road 1 at City Depot.

The Army carried cars 1 and 303 as a training exercise. The well of their low loader was raised with sleepers to make a flat trackbed. Publicity for the celebrations was already evident as no. 1 arrived at Morphettville.

ABOVE:
During mid May, Adelaide streets saw a procession of trams moving from St. Kilda to Morphettville. Cars 282 and 381 were carried by OPS Trucking on the low loader which had previously been used for locomotives. A steel extensionwas welded on to the rear of the loader to accomodate the rear bogie of 381. It ultimately proved necessary to remove the front bumper in order to get the rear wheels on. The trolley hooks were removed to reduce height.

BELOW: *Drop centre 282 waits to be unloaded at Morphettville. Ramp height is approximately three feet. The rear wheels of the trailer are in a shallow depression to allow the rails to join.*

Photos by John Radcliffe.

Horsecar 18 at the head of the tramway vehicles in the procession, arrives at Victoria Square. Passengers and crew were in period costume. The Premier waves to the crowd from the front stairs. - The Advertiser

The Celebrations

To commemmorate the centenary of street transport in Adelaide, a comprehensive programme had been drawn up culminating in a display and procession of road and rail vehicles on Sunday 11 June 1978.

After the arrival of the AETM trams at City Depot various trials were undertaken. The first scheduled event of the celebrations was an evening trip on Friday 2 June 1978 to Glenelg in 282 following an address to the Historical Society of SA by Dr. J.C.Radcliffe. From then on the trams made public appearances, with 1 on display in Victoria Square and 282, 303 and 381 running to Glenelg during the afternoons over the holiday weekend of 3, 4 and 5 June. This was repeated on Saturday 10 June and Saturday and Sunday 17 and 18 June. 282 and 381 were also hired out for trips by schools and other groups during the second week. A three set of H's, two silver and one brown, made a trial run to Glenelg in the afternoon of Friday 9 June.

A Centenary Dinner , sponsored by the AETM, was held at the Pier Hotel, Glenelg on Saturday night 10 June. To convey guests, 282 and 381 left Victoria Square at 7pm. After arrival at Glenelg the two cars operated in traffic then conveyed the guests back to the city at about 11pm.

The main celebrations took place on Sunday 11 June 1978. From early morning vehicle were towed or driven to Victoria Square and placed on display. These included AEC double deck TB 417, Leyland Canton single deck TB 488 (restored), Mack bus 65 (unrestored), open top Garford 208(restored), the Green Goddess, Bee Line Leyland Worldmaster, 3 door Leyland Worldmaster 908, new Volvo 1116; various buses taken over by the STA from private operators, AEC 40 a circle line bus, a new STA Roadliner tourist coach; these were joined later in the morning by electric tram 1 and horsecar 18. 282, 303 and 381 provided a service in King William Street until the procession formed. 282 ran one trip to Goodwood to be photographed on the flyover as steam loco 520 and train passed beneath on a special working.

The highlight of the day was the Centenary Procession. At approximately 2.30 a troop of mounted police lead the way followed by a varied collection of horse drawn vehicles, vintage cars, the Yorkshire steam bus and a London RT double decker. Then came the trams. Horse car 18, nominally driven by the Premier of South Australia, the Hon. Don Dunstan. This was followed by 1, carrying the Police Band, 282, 303, 381 and a three car set of H cars, 366, 367 and 368. This had been formed by amalgamating the coupled set which had previously gone to Glenelg to pick up mail, with the following service car. The mail was transferred to the horse car for the journey along King William Street.

On arrival at Victoria Square, the Premier delivered the mail to the SA manager of Australia Post and then unveiled a commemorative plaque. The old trams then formed part of the display in the Square until the electric cars later took up running in King William Street. This was the only public running by no. 1. 282 and 381 each did a trip to Glenelg at just after 5pm.

All the events received wide and favourable coverage in the media and drew large crowds of spectators and long queues of people waiting for a ride.

RIGHT: *H cars 366, 367 and 368 coupled into a three car set bring up the rear of the procession in King William Street. 11 June 1978.*
- M.McAulay

BELOW: *Restored open top double deck Garford bus 208 on display in Victoria Square.*
- R.Hall

NEXT ISSUE: The next article in the series DESTRUCTION OF AN ASSET looks at what has gone before in Adelaide and other South Australian towns.

The first and the last! 1 and 381 shunt in King William Street whilst providing a shuttle service on Sunday 11 June 1978.
- M.McAulay

A stranger in town! Although not unknown on the Glenelg line, the older bogie cars were not a common sight in Jetty Road Glenelg. The last F1 to run to Glenelg, to be loaded on a truck to go to St. Kilda in 1959, 282 carries a capacity load during its brief comeback.
- M.McAulay

One of the most travelled trams in Australia, Having operated at Port Adelaide, Geelong and Bendigo before going to St. Kilda, Birney 303 has at last returned to the parent system it never knew and in so doing became the first 4 wheel car to regularly operate in passenger service to Glenelg.
Moseley Square, Glenelg.
- V.Solomons

ABOVE: *Always a resident of small town depots Birney 303 nevertheless looks at home as it stands outside the impressive looking City Depot in Angas Street, Adelaide on 10 June 1978.* - R.Hall

BELOW: *The last occassion when a horsecar operated in King William Street, Adelaide was during the South Australian Centenary Celebrations in 1936. Adelaide and Suburban 2 precedes A1 and an F and H type cars.*
- STA Collection

THE SYDNEY SCENE

Transport News from the Sydney Region

RAILWAYS

TRAFFIC: The new timetable introduced on 27 May 1978 has been working well with holdups in the initial stages attributable to other factors. Single deck suburban sets are still operating during the weekday off peak, with rare appearances on Saturdays. Running times have not generally been shortened so that use of the older, slower sets is not causing any problems. The use of 2 car double sets extends into the peak periods creating overcrowding on some runs. Electric interurban services have been improvrd by the use of more double deck sets, largely eliminating loco hauled workings. On the western line short workings to Glenbrook and Springwood have been extended to Lawson, Katoomba and Mount Victoria. Despite the increase in the double deck interurban fleet and the calling of tenders for more 2 car diesel sets, conversion of loco hauled stock to supplementary interurban cars continues with steel bodied FS class cars now being included in the programme.

The new down main line between Rooty Hill and St. Marys on the western line, was brought into use on 19 May 1978, followed by the up main on 11 June 1978. As on the four track section between Westmead and Seven Hills, this section is also arranged for parallel rather than alternate operation, with the outside tracks the mains although in practice the inside pair are so used. The original (inside) pair of tracks have been taken out of service for rehabilitation before 4 track working is introduced.

The up track through the Zig Zag tunnels near Lithgow, was brought back into service on 18 June 1978. It has been signalled for two way working as the single line electric train staff working over the down line (See TW Feb 1978) caused too many delays due to limitations on following movements.

STATIONS: Aprogramme of rebuilding the platform faces at 28 suburban stations is being undertaken. These are mainly earth filled with precast concrete panel facings and date from electrification when the loading gauge was enlarged. They are generally showing a tendancy to bulge outwards. Work on platform 1 at Flemington and 4 and 5 at Strathfield is nearing completion and work has started on platform 6 at Strathfield.

Loftus station is being entirely rebuilt with a precast concrete framed structure of sufficent length to take 8 car electric trains replacing the short wooden platforms. The station building was removed bodily from its position on the old up platform to the new platform closer to Sydney.

The National Parks and Wildlife Service has called tenders for a new station at the Royal National Park. This will form part of a visitors centre on the site.

The State Government has announced plans for a multi million dollar entertainment centre to be built in the Haymarket on the site of the former produce markets. It was considered to be close enough to public transport facilities to be a viable proposition. However the City Council has made a counter proposal to site such a complex over Sydney Yard. This is the latest attempt by the Council to bury the yard under some monolithic development.

The State Government also proposed to redevelop Sydney Station and called for submissions from speculators for commercial and hotel projects which were to be built on and around the existing buildings and platforms. The character and charm of the main building would undoubtably been destroyed. No acceptable proposals were received and a scheme prepared by the PTC is now being considered.

ROLLING STOCK: The statement in TW April 1978 doubting that first 3552 was being converted to a narrow bodied parcel van arose due to conflicting information supplied after this item appearred in TW February 1978. During June, 3378 was being converted into a parcel van to replace 3558; first 3552 had been narrowed and fitted with with E type (1955 suburban/interurban) bogies after modification to the underframe and another car, as yet unidentified, was being rebuilt into a shunter. Further narrow bodied parcel vans, including at least one trailer, are proposed.

Former 3558 ran a trial from Elcar to Hornsby and reurn on 9 May 1978 in its new guise as suburban profile car SPC 1. Besides repainting, anadditional window has been installed in the centre of each side. Fitted with new measuring equipment, it underwent tests in the tunnel on the former Milsons Point, now North Sydney Car Sidings, line on 20 May 1978. This car is now operating under its fifth number, which appears to be a plant rather than rolling stock series,

unlike overhead line cars AL20 and AL21 which are in the special vehicle series. Previous numbers carried were C3558 and C3908 as a parcel van, C3020 as a suburban motor car and EBB 2182 as a steam hauled car. The original 3554, which still exists at the AIS steelworks at Port Kembla, is the only other electric car to date, to carry five different numbers.

A loco hauled country profile car is under construction at Eveleigh Carriage Works.

The two 1955 type cars standing stripped at Elcar are 3737 and 3738 and not 3732 as reported. As most Sydney readers appear to have noticed, 3732 has been fitted with the new windows and returned to traffic. Also noticed at Elcar in early June was the stripped shell of trailer 4413. This vehicle had some time ago been fitted with aluminium framed windows and painted blue and white. Still in the yard, where it has stood for some years, is FS 2928.

EASTERN SUBURBS: All trackwork is now laid on this line and work is progressing on the overhead wiring, stations and the bus interchanges at Edgecliff and Bondi Junction. A four car double deck set was loco hauled to Edgecliff on 21 and 22 May 1978 for test purposes. The previous double deck set on the line only went to Kings Cross.

A recent report in the Sydney Daily Telegraph that the line would open on 29 January 1979 (Quoted as 27 January 1979 in TW April 1978) was officially denied. However tenders were called in mid June for the lease of commercial space on the gallery level at Martin Place station with the stipulation that all fitting out work must be completed by 16 January 1979.

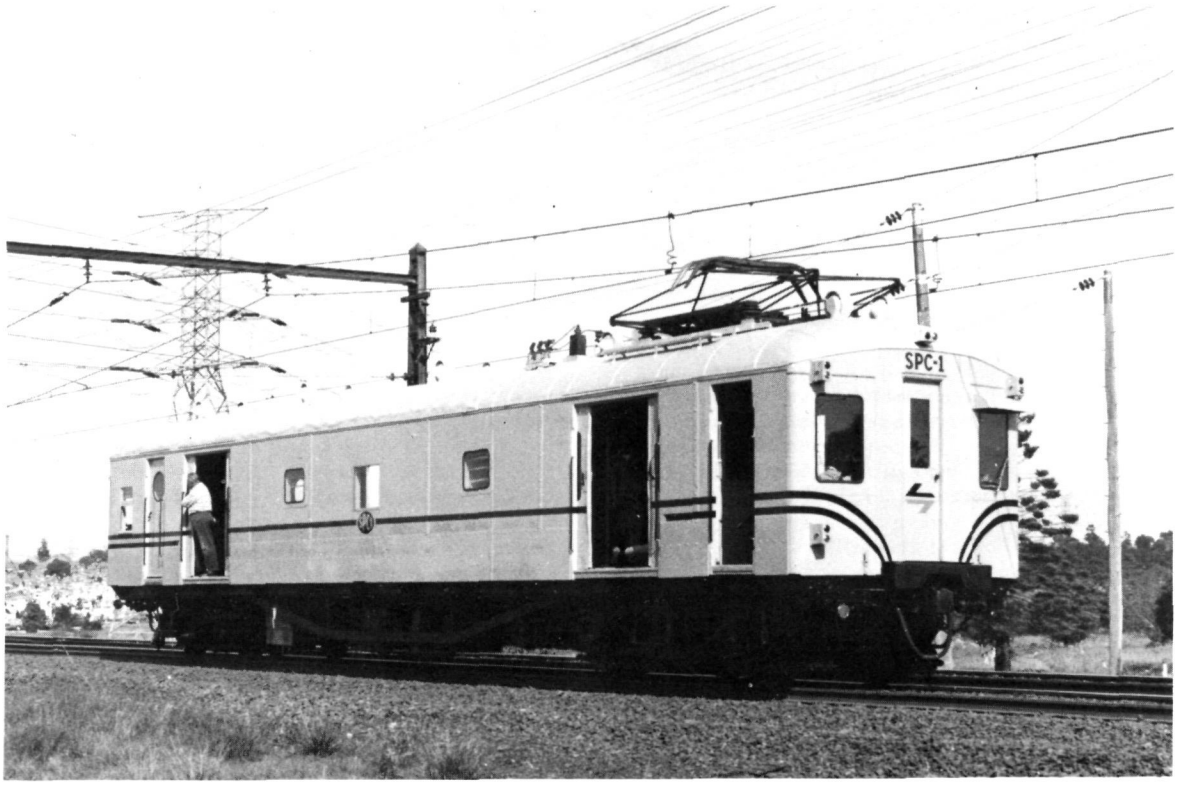
BUSES

Tenders have been called for the sale of an initial six Atlanteans and a number have already been sold. The local market for these vehicles would appear to be limited with the only major operators of double deck vehicles being some North Coast services which are using imported second hand Atlanteans.

The PTC have withdrawn the last of their AEC Matador tow trucks. Initial replacement was by six wheel Leyland units but these have now been supplemented by four Volvo F86s.

PRIVATE OPERATORS: The continuing restructuring of the private bus industry has seen the Gladesville based Hunters Hill Bus Company change hands in the latest move. Operating in the general area between Chatswood and Ryde it is a major user of rebuilt ex Adelaide 3 door buses. The new owners trade as Northern and Western Bus Lines.

Looking only like a yellow parcel van, ex 3558 in its new guise as Suburban Profile Car, SPC1 passes Rookwood Cemetery on its way back to Elcar after a trial trip to Hornsby on 9 May 1978. The new measuring equipment had yet to be fitted at this stage.



CITY SECTION

News of the Melbourne and Metropolitan Tramways Board

Work on the East Burwood extension was rapidly drawing to a close at the end of May with the anticipated opening date of 14June in sight. On Sunday 28, the new tracks were laid across Warrigal Road to about 25 feet west of the building line. The old terminus was due to be removed and replaced by new track to enable rout 74 trams to be extended some two hundred yards east to the new crossover (on the exten - sion). Following this the last two hundred yards of the up track beyond the crossover was to be concreted to complete the trackwork. However, industrial trouble has caused a black ban on new electrical work and this means that the overhead wiring cannot be completed either at Warrigal Road or the new crossover. When the dispute is settled a few hours work will see this minor extension take place. Over half the trolley wire on the reserved track section is in place but not all has been clamped into the ears as yet. It now appears that it will be some time before trams run to East Burwood.

Nicholson Street, Fitzroy, continues to be upgraded from a conventional street tramway. Concrete curbing on the east side of the up track has been extended northwards from Alexandra Parade to Park Street, with safety zones at stops and a short section of jiggle bars approaching the first safety zone. On the west side along the down track, from Victoria Parade to Alexandra Parade, safety zones and jiggle bars have been inserted. A comparison is being made of the two types of segregation. The realignment of La Trobe Street at Museum Station (east of Elizabeth Street), is scheduled for mid June, followed by recommencement of work on relaying Swanston Street.

Approval and finance has been given to the Board for work on two tourist trams. Freight car 17W is being reconverted to its original form as open crossbench car V 214 (M&MTB number) or North Melbourne 13. X2 676 is to be repainted brown instead of the present green. Late in May tenders were called for the supply of further new buses and for the sale of fifteen more of the AEC Mk 3 vehicles. In recent months large transfers have appeared in the new type waiting shelters showing the complete tramway system with routes colour coded. They are placed on the centre glass petition and as their backgro-und is transparent, the routes stand out in their respective colours very well. Z class tramcar body 100 was received from Com-Eng on 24 May thus completing the original order. A further fifteen cars are now in the course of construction as an extension of the first order. There will be some modifications to this batch. The latest car in service is 93. The articulated trailer arrived back from the USA in May for the second W2 car, 512, which was due to be loaded on 31 May and depart from Preston for the roll on roll off ship two days later.

Details of the contract for 100 new trams for Melbourne appeared in a supplement to the December 1977 issue of Trolley Wire. For the benefit of those readers who lose such loose sheets the information is repeated here so they may have a permanent record:

NEW TRAMS FOR MELBOURNE

The Victorian Minister for Transport, Mr. Rafferty announced on 13 December 1977 that the M&MTB had issued a letter of intent to Commonwealth Engineering (Victoria) Pty. Ltd. for the supply of 100 trams at a cost of more than $30 million.

There will be major differences from the present order for 115. Heating and ventilation will be improved and seating will be rearranged to provide more led room. An extra rear door will make it easier to disembark and changes are being considered for the conductor's area.

Whilst the above body changes are major in themselves the below floor equipment will be entirely different. Chopper control will be used which is expected to result in a 40% reduction in power consumption and so obviate costly amplification of substations. It was also indicated that regenerative braking would be incorporated. The electrical equipment will be supplied from Germany by AEG and Siemens and will be assembled locally by O.J.Nilsen.

The bogies of Duwag design and therefore, presumably, with one longitudinal mounted motor each, would be locally assembled using imported and Australian made components.

The bodies will be built at Dandenong and delivery will follow on from the present contract which should be completed in December 1978.

As will be noted from earlier in this section the follow on order for 15 cars is to be to a modified design. Whilst details have not been released, comparision should only be made between the original 100 and the new 100 cars.

★ Museum Notes and News

C.O.T.M.A.

News from the Council of Tramway Museums of Australasia

Fourth Conference

The Fourth Australasian Tramway Museum Conference was held under the auspices of the Council of Tramway Museums of Australasia in Christchurch, New Zealand, between 22 and 25 April 1978. Host museum was the Tramway Historical Society, Christchurch, operators of the Ferrymead Tramway. Fifty delegates attended from various museums in New Zealand and Australia. The Conference, the first held in New Zealand, was outstandingly successful.

The Conference was formally opened by the Chairman of the Christchurch Transport Board, Mr. M.Holdsworth in Cathedral Square on Saturday 22 April 1978. As part of this ceremony, the CTB presented the Tramway Historical Society with the first of the AEC Regal 4 motorbuses which had replaced the trams in 1954, no. 290. After the handing over ceremony, Mr. Max Taylor, General Manager of the CTB, invited delegates to board the bus and personally drove them on a guided tour of the city. *En route,* the delegates called at the premises of Boon and Company who had in earlier years constructed many of New Zealand's trams in their Ferry Road shops.

After the Commencement Luncheon, THS President David Hinman, standing in for New Zealand transport historian Graham Stewart, presented a review 'Trams In The Streets - How far can Museums go in recreating history?' This paper was followed by the Keynote Address given by Geoffery Claydon, long time Secretary of the Tramway Museum Society of Great Britian and invited guest to the Conference. His address, entitled 'The Crich Experience - Analysis of a Successful Museum', discussed many of the crucial trials and experiences of developing Crich into one of the world's premier transport museums. The remainder of the afternoon was spent in workshop discussions, whilst the evenwas given to a convivial review of the progress made by the various museums over the last twelve months.

Sunday morning 24 April was spent in further workshop deliberations and in studying the reports of various COTMA Committees. Particular attention was given to examining museum safety programmes developed since the previous Conference in Adelaide. Some concern was expressed that greater progress had not been made and delegates agreed to further their endeavours in this direction.

On Sunday afternoon the THS took delegates inits ex London double deck bus over atour of former tram routes and then to its Museum at Ferrymead. Here visitors were able to sample the delights of Brill 178, fresh from a bogie change some nights earier and Dunedin 22. The Kitson steam tram was out with the Duckhouse trailer, whilst many delegates were impressed with 'The Beast', a steeple cab works vehicle constructed on a former Melbourne no. 9 bogie. A display of particular THS skills was presented, an especially interesting exhibit being that covering the pioneering work which the THS is doing in pattern making and casting of replica tramway parts and equipment. The evening concluded with a most enjoyable dinner at the nearby Ferrymead Tavern.

Monday morning dawned with delegates back at work in earnest. The opening paper by Bob Scott of Martonair Division, MacEwans Machinery Ltd., discussed the principles of pneumatic systems under the title of 'Design and Maintenance of Compressed Air Systems'. The specific problems of tramcar air systems were outlined. Later in the morning delegates were able to review an earlier paper by Ferrymead Chairman Simon Wood and their own impressions of Ferrymead in an open forum chaired by COTMA Chairman John Radcliffe and entitled 'Observations at Ferrymead - A Critical Analysis'. That

afternoon Peter Randall examined museum devopments in New Zealand and their relavance to the tourist. His paper highlighted the development of a very large number of small folk museums in the country, often with poor facilities and little chance of long term viability. Yet it is with this proliferation of museums that the transport museums must compete. The days deliberations concluded with a panel discussion entitled 'Volunteers versus Paid Staff - Preserving and Promoting Harmony and Productivity'. This session served to highlight the increasing public funds, principally from unemployment and job creating schemes, now becoming available for museum development. Geoffery Claydon's wisdom from Crich's experience was particularly helpful in this session.

The Conference concluded with the formal Council Meeting on Tuesday 25 April. At this meeting, it was agreed to standardise safety proceedures and accident reporting. Mr. David Rawlings was appointed COTMA Safety Officer; Dr. John Radcliffe was re elected COTMA Chairman and Mr. Keith Kings as Cotma Executive Officer.

The Conference served to highlight the very successful tr nsport museum development being carried out in New Zealand by Groups operating in cities with rather smaller populations than are found in Australia. The hospitality of TMS members in Christchurch was memorable and many Australian delegates subsequently enjoyed visits to the Wellington Tramway Museum and to the Tramway Division of the Museum of Transport and Technology in Auckland. A particularly valuable contribution to the success of the conference was made by invited guest Geoffery Cl ydon whose real wealth of experience was quickly appreciated by all delegates.

The next conference is scheduled to be held in Brisbane in June 1980. It will be hosted by the Brisbane Tramway Society.

Warning

The attention of all readers is drawn to a serious problem in Melbourne. We all like trams and to a greater or lesser extent, buses and trains and it is almost certain that we all like looking around depots. *BUT*...do it the right way; that is, either be part of a society inspection group or make an arrangement with the Head Office of the M&MTB (or the local authority in the city concerned as this applies everywhere). To walk in unanounced is inviting trouble. This has been emphasised by recent events in Melbourne. At various times over the years, stored trams in the Board's depots have been found to have parts missing, but there has been a particularly bad episode recently. Whilst there is nothing to indicate that a member of a COTMA society has been responsible, it should be obvious that any such person found in the wrong place at such a time would be in a very awkard situation; be safe, stay out! If anyone, COTMA member or otherwise, is caught in a depot without permission our relationship with the body concerned would be jeopardised. 'Just looking around' is *trespassing;* 'souveniring' is *theft;* both are punishable offenses. Please do not place yourself or the several societies in an akward position.

COTMA Delegates at Ferrymead - Bob Merchant

BYLANDS . . .

Tramway Museum Society of Victoria

Pupils from Rochester High School visited Bylands Tramway Museum in February 1978. Many saw trams for the first time in their lives. Here their School Photographer has taken them at the horse tram platform as they ponder a different use for a horse!

The Melbourne Room at the State Government Offices on 20 March saw many representatives from the various societies which took part in the first Transport Cavalcade gather for a reception given by the Premier, Mr. R.Hamer. Although the event was financed by the Government, the exhibits were provided and staffed by the societies in the main, together with the M&MTB, VR and Fire Brigade. Mr. Hamer extended his congratulations and appreciation to all concerned and stated that the success of the day could be judged by the many thousands of the public who attended - despite the poor weather. He added that the Committee (of the societies) should consider holding the event again next year to which end he offered financial support.

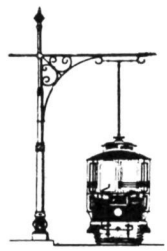
We recently held a major fund raising event in the form of a raffle. A very beautiful painting of the 'Paris' end of Collins Street (complete with tramcar) had been donated to us by a proffessional artist as appreciation for a favour arranged for him on behalf of the Society by Robert Green. A valuation of the painting - $500 - was obtained, we complied with the various other provisions of the Raffles Board and commenced selling tickets at the Cavalcade of Transport. The raffle was drawn on 17 April at a social meeting, the winner being Mr. G. Barrett c/- Rochester High School, Victoria. Our funds gained by nearly $1400 from this effort.

Our bi-monthly meetings (social) of earlier years gradually lost popularity some two or three years ago and were eventually discontinued. This one was very successful and as a result another will be held on 12 July.

Work has recommenced on the radiax truck for the Geelong Pengelly car with the cleaning down and application of bituminous paint to various components. Cable trailer 299 makes steady progress with more paint applied and all the window sashes and sun louvres stripped of varnish. Mr. Twentyman has kindly taken these to his home for sanding and completion.

The original sign at the front gate has suffered from the elements for some years now and was removed late in May and replaced by a new sign. Likewise, the freestanding admission sign has been repainted and adapted as a hanging sign to be attached to the rear of the shed during opening hours.

LOFTUS . . .



South Pacific Electric Railway

Rolling Stock

The northern end cab framing of R1 1979 has been replaced and the exterior sheeting reinstalled. Work continues on the saloon interior. Whilst still in the mood for tram stripping the tramcar maintenance section then turned their attention to the south (no. 1) end of LP 154 and partly dismantled it for inspection and repair. This car is to receive an exterior repaint, retaining its present fawn and grey scheme but with the correct duller shade of grey which looks drab even when new.

Open fronted R1! 1979 with the north end cab stripped. - R.E.Hall

New Site

Problems are still being encountered with the right of way beside the Princes Highway to Sutherland and until these are settled it is not desirable to proceed with any major work on the new depot site at Loftus station. However some preparatory filling and leveling has been done to enable aquick start to be made as soon as the time is opportune.

Bus Tour

As mentioned in April Trolley Wire, Albion double decker 615 has been in Wollongong receiving some necessary mechanical and electrical maintenance. Bill Parkinson undertook this and repainted the exterior as well.

Atrip to bring it back to Sydney was organised and a group of 20 left Sydney on the South Coast Daylight on Saturday morning 3 June 1978 for Unanderra where 615 was waiting. First stop was Rutty's depot at Figtree where vehicles of interest were ex Adelaide AEC Regal 3's and prototype Sydney underfloor ex 2520. The Port Kembla industrial area was then visited where Ken McCarthy pointed out the route of the former electric railway. Northbound once more, Watts' depot at Wollongong revealed an unregistered German Bussing underfloor with a Properts body. After lunch the next stopwas Doin's at Fairy Meadow. Two old vehicles, both unregistered, still on the property were a forward control Guy also with Properts bodywork and a double decker, on of the few built for a private operator, although still with DGT style body. Departure from here was at 2pm and Sydney was reached at about 4.30, quite a credital performance for a 39 year old bus that has worked hard for its living.

ST KILDA . . .

Australian Electric Transport Museum

Two Museums

From mid May, the activities of the AETM have been complicated by the necessity of hav -ing to operate from two separate depots. With four of the cars away from St. Kilda, traffic operations have been thrown heavily onto the cars remaining at home. Cars A 21, Ballarat 34, E1 111 and W2 294 have provided the main services. Publicity associated with the Centenary has meant extra crowds visiting St. Kilda. Regular school holidays operations had to continue. Only on 11 June, the actual day of the Centenary Celebrations in Victoria Square, were regular Museum operations suspended.

Despite the uproar of the Centenary preparations, a small group led by Chris Andrews has painstakingly continued the restoration of D 192. Steel ordered for the conversion of W2 354 into a works car has been delivered to St. Kilda and design work on this project is continuing.

Museum Accesions Project

Under a State Unemployment Relief Scheme grant obtained through the South Australian Museum, an anthropologist has commenced preparing an accession and parts register for the Museum. Initial work is centred on items at St. Kilda and City Depot. It is hoped to also register the many archival records held privately by members on behalf of the Museum pending erection of suitable facilities at St. Kilda.

Depot Improvements

New roofing iron has been delivered to allow approximately one third of the roof of the original depot to be replaced.

Restoration Of Car 303

Restoration of car 303 has continued, being relocated to City Depot with the car. Fifteen AETM members have been authorised by the Museum to work on cars located in road 1 at City Depot. Damaged glass on car 303 has been replaced. The doors have been rearranged to open outwards as originally constructed. Door engines provided with the car from Bendigo have been fitted. Doors now operate using motorman's valves made available by the STA from their spare equipment from H cars. (These valves originally operated the doors on the H cars.) The exterior of the car has been completely re - finished by AETM members since it has been at City Depot. STA workshop staff at the depot have provided helpful advice and friendly competition for members working there.

STA staff under Depot Foreman Blair Howell have done a number of minor jobs on Museum cars in preparation for the Centenary. These tasks include servicing the motors of no. 1, replacement of a door engine in 381 and general inspection of the condition of the cars.

Trial Run

Four electric cars, A 1, F1 282, G 303 and H1 381 and horsecar 18 were transferred to City Depot for the celebrations. A trial run of 1 and 18 with horses was held amid nominal secrecy on Sunday morning 21 May 1978. Five hundred people arrived to witness the event. The cars operated to South Terrace and back and the opportunity was taken to line up the Museum cars for photographs in Angus Street.

Restoration Of 488

In late April, Leyland single deck trolleybus 488 was taken from the Northfield Research Centre where it has been stored for several years to Hackney Depot. It has since been completely restored for the Centenary celebrations. Work included repainting, repanelling, reupholstery, replating of all brightwork and reinstallation of much of the electrical equipment. A motor has been purchased from Wellington for this vehicle and it is hoped to have it installed at Hackney before the bus is returned to the AETM.

OPPOSITE: *The regauged diamond frame bogie being manoeuvred into position for replacing under one end of Ball's Head Coal Loader cable hopper car 24 on 8 April 1978.*
- K.McCarthy

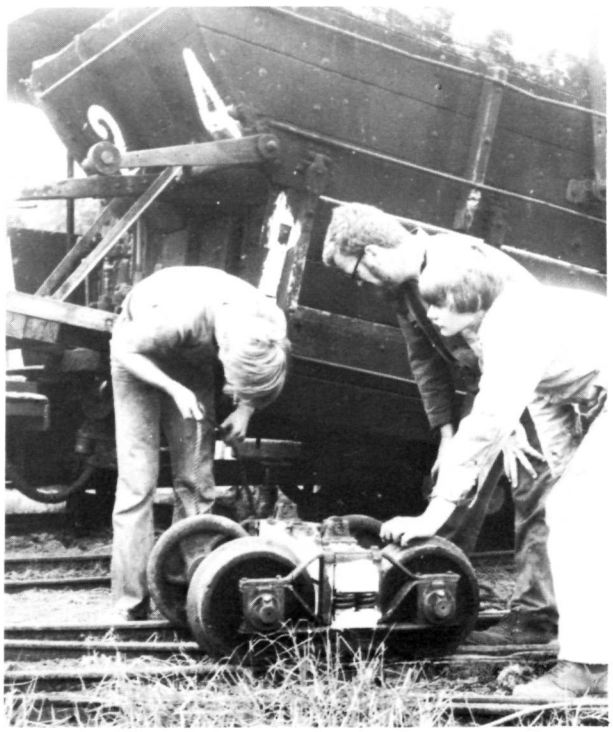
ALBION PARK . . .

Illawarra Light Railway Museum Society

Locomotives

The day after its arrival on Wednesday 29 March, ILRMS member Paul Simpson coaxed the 20hp Ruston Hornsby diesel loco (B/n 285298) to life and following an oil change and other adjustments this unit was busily employed on the ILRMS museum railway on 8 April. The loco carries engine number 273676 and was last employed on sewer main excavation work in the Warringah area of Sydney. The large four wheeled skips received with this unit, as mentioned in the last ILRMS report, are of English and U.S.A. origin. Those from the UK were built by Allen's of Tipton while the balance were constructed in Colorado by C.S.Card Ironworks.

During the mid May school vacation period considerable progress was made on retubing the Hudswell Clarke loco 'Cairns' and the (ex Kiama) Davenport. When it was discovered that the tube holes in the front plate of 'Cairns' were larger than the backplate holes, Garnock Engineering of Port Kembla offered to expand the tube ends free of charge to the Society and the entire 114 tubes were in place by 9 May.



Throughout May work continued on expanding and beading the tube ends and tightening the longitudinal boiler stays. This work has been simplified by the use of air operated tools, receiving compressed air from a mobile compressor donated earlier by Allied Plant Services.

The Society is hopeful that 'Cairns' will be in steam during July, as all the boiler plumbing, gauges and cocks are in place, but this will depend on any adjustments which may prove necessary during the coming boiler tests.

On 13 May some seventeen 2in diameter tubes for the Davenport were received from Tubemakers and by 20 May five of these had been fitted to this American locomotive replacing defective ones detected in an earlier hydraulic test. This loco underwent another hydraulic test on 27 May and the boiler held a pressure in excess of 150 lbs/sq inch, the result of which revealed that some further expanding will be required on the new tubes. At the conclusion of the test, however, the pressure dropped dramatically and an inspection of the steam dome revealed that an old crack near the fastening lug of the main cast iron steam pipe on the regulator valve had extended and fractured. This pipe will now have to be repaired and strengthened before any further tets can be conducted.

During the week ending 20 May the restored chassis of the ILRMS 0-6-2T Perry loco was lowered onto its wheels and the spring lever system refitted. Although work has continued off site restoring the parts of this loco, major work normally conducted at the Museum has been postponed so that more effort can be placed in the restoration of the Davenport and 'Cairns'.

The large 2ft gauge Mancha battery electric locomotive received from Portland N.S.W. on 21 February 1976, returned to traffic during March after being overhauled and repainted. This unit now carries batteries amounting to about 80 volts, and although designed for a 100 volt supply, the loco responds well to its present reduced supply.

During April and May the framework of the two sides of the American style cab for Shay 2 (B/n 2097, Lima 1908) was constructed. The

next step in this project will entail the replanking of the floor so that these cab sides can be placed in position to receive the front cab wall. The July 1978 issue of *Light Railways* will feature the history of the Munro tramway at Palmtree, Queensland, on which the two ILRMS Shays operated. This will be available from the SPER bookshop at Loftus upon publication.

Rolling Stock

On Thursday 20 April the framework of a saloon bogie car arrived at the Museum. The length over the saloon is 15ft while the length over headstocks is 20ft. The width over the saloon is 6ft 6in, over underframe 6ft and extreme widthover steps and grab raila is 7ft 1in. The car is of end platform design and the interior head room is 6ft 6in. It is at present mounted on two bogies obtained from the former sugar mill railway at Condong N.S.W. The car's steel frame was fabricated free of charge by Allied Constructions (A subsiduary of B&W Steel) and consists of a chassis of 6 X 3in channel sections, 2in angle uprights, a 2¼in diameter pipework roof frame and a 1¼in diameter end platform framework.

The ILRMS workforce has to enclose the saloon sides up to the window sills, plank the floor and cover the roof. Upholstered bus seats are on hand for this passenger vehicle.

On 1 April a pair of diamond frame bogies were delivered to Albion Park from Garnock Engineering after being regauged from 20in to 24in. These were reinstalled under Balls Head waggon 24. Waggon 31 is still on temporary 2ft gauge bogies while its original set are being regauged. This job entailed the fitting of new wooden bolsters, while the axles were cut in the centre and a tight fitting pipe welded in position to increase the gauge by 4in.

Track Extensions

On 25 April the Croome Road track was extended by three lengths onto the new leased area. This is the first main line trackwork carried out at Albion Park for some time, but until work gets underway on the entire main line circle of one third of a mile, this short extension will be used to house the waggons received from Leighton's during March.

* *

MOUNT PLEASANT COKE WORKS

These coke works, adjacent to the old 3'8½ in/4'8½in railway crossing at North Wollongong were demolished during May. The oven brickwork was noticed being broken up on 1 May and by 26 May only the metal hoppers and flue system remained. The SPER Tramway Museum was fortunate in obtaining some overhead wire clips and ears. These were used at the coke ovens to support several sets of three phase trolley wire running the full length of the ovens from which the loading hopper cars and the coke rams received their electricity supply.

FERNY GROVE . . .

Brisbane Tramway Museum Society

On the depot scene, the front doors on no. 1 have been finished and the trams therein are at last behind locked doors. Work has been commenced on the second side of the roof of no. 2, with two bays completed by late May. Plans are at present being made for the mass concreting of the no. 1 depot fan, a job requiring a great deal of thought and financial outlay.

In the substation, the concrete base for the low tension switchgear has been poured and attention will shortly be given to further security measures.

With the advent of cooler weather, some general tidying up of the site has been undertaken. Two members of the Hadden Tramway Workshops visited Ferny Grove recently and along with some other unattractive tasks, despiked and stacked some 50 sleepers.

Vehicles are mobile on the site! AEC bus 80 is to make the journey to the ARHS Field Day at the Redbank Museum as our contribution on 28 May and the Ford V8 Car Club is to visit Ferny Grove on the following day.

Although the COTMA Conference originally planned for Brisbane next year has been put back to June 1980, the scheduled opening of the BTMS will still be on the tenth anniversary of the Brisbane Tramway closure at Easter next year.

MUSEUM DIRECTORY

AUSTRALIAN ELECTRIC TRANSPORT MUSEUM (SA) INC. St. Kilda, South Australia.

Trams — Trolley Buses — Electric Locomotive

Trams operate Sundays & Public Holdays 2 — 5 pm. No public transport available. Interstate visitors please contact the AETM if transport required.

In emergency phone (08) 297 4447.

Correspondence: The Secretary, AETM (SA) INC., Box 2012 G.P.O., Adelaide, S.A. 5001.

BALLARAT TOURIST TRAMWAY
Ballarat Botanic Gardens, Wendouree Parade, Ballarat, Victoria (Ballarat Tramway Preservation Society Limited).

Tram Rides, Static display of trams, photos; Sales Department etc.

Operates Saturdays, Sundays and Public Holidays (Christmas Day excepted) and most days during Victorian School holidays and the Ballarat Begonia Festival 11 am — 5 pm.

Telephone: Tram depot (053) 34 1580, Bungaree House (053) 34 0296

Correspondence: The Secretary, B.T.P.S. Box 632, P.O., Ballarat. Victoria. 3350.

BRISBANE TRAMWAY MUSEUM SOCIETY McGinn Road, Ferny Grove, Queensland

Static Display of trams and trolleybuses

Correspondence: The Secretary, B.T.M.S., McGinn Road, Ferny Grove, Queensland. 4055.

WESTERN AUSTRALIAN TRANSPORT MUSEUM (INC).

Tramway Museum and Bus Operation, Castledare Boys Home, Watts Road, Wilson. W.A.

London RTL Double deck bus rides 1st Sunday in month 1.00 pm to 5.00 pm.

Correspondence: The Secretary, Box 33, P.O. Maylands, W.A. 6060.

STEAM TRAM & RAILWAY PRESERVATION (CO-OP) SOCIETY LIMITED Parramatta Park Steam Tramway, Parramatta N.S.W.

Steam Trams are operated on the 3rd Sunday of every month, from 1.30 to 4.30 pm.

The Society possesses 1 steam tram motor, 2 steam locomotives and 5 various trailer cars.
The surrounding parklands are suitable for picnics, barbeques, etc. and contain historical buildings.
Public transport is available. Rail to Westmead station then walk across parklands to the depot.

Correspondence: (SAE would be Appreciated) The Secretary, S.T. & R.P.S. Box 108 P.O., Kogarah. N.S.W. 2217

SYDNEY TRAMWAY MUSEUM Princes Highway, Loftus N.S.W. (South Pacific Electric Railway Co-op. Society Limited).

Electric trams from N.S.W., Queensland and Victoria.

Tram rides Sundays and Public Holidays (Except Christmas Day and Good Friday) 10.30 am — 5.00 pm.

5 minutes walk south from Loftus Railway Station.

Correspondence: The Secretary, SPER, Box 103 G.P.O., Sydney. N.S.W. 2001.

TASMANIAN TRANSPORT MUSEUM SOCIETY, Glenorchy, Tasmania.

Comprehensive transport museum under construction

Correspondence: The Secretary, T.T.M.S., Box 867J, G.P.O., Hobart. Tas. 7001.

VICTORIA'S TRAMWAY MUSEUM Union Lane, Bylands, Victoria. (Tramway Museum Society of Victoria Limited.)

Horse tram rides, museum site, trams, photos and other items on display, Sunday 11.00 am to 5.00 pm.

Correspondence: The Secretary, TMSV, Box 4916 Mail Exchange, Melbourne, Victoria. 3001.

ILLAWARRA LIGHT RAILWAY MUSEUM SOCIETY
Albion Park N.S.W.

Inspection of exhibits by arrangement, phone (042) 71 3707

Correspondence: The Honorary Secretary, Box 1036, P.O. Wollongong N.S.W. 2500

BACK COVER: *Adelaide and Suburban Tramway Company car 51 was a single deck car when photographed outside Stephenson's New York Plant, but it is believed to have been converted into a single ended double deck car in Adelaide.* - Museum of the City of New York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